Design

VERSION 4.0

Cognitive Contact

TheraTouch provides a new and efficient way to test and gather data from cognitive and physical rehabilitation sessions. TheraTouch uses the Microsoft Surface provides a new, interactive way for rehab to be facilitated. This document provides detailed specs on design for the TheraTouch and also TheraLink, the clinician interface for the surface.

Texas Christian University

©Computer Science Department

04 May 2012

Revision Sign-off

By signing the following, the team member asserts that he/she has read the entire document and has, to the best of his or her knowledge found the information contained herein to be accurate, relevant, and free of typographical error.

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Revision History

VERSION	DATE	CHANGES
Version 1.0	12/21/2011	Initial Draft
Version 2.0	02/16/2012	Second Draft: Updated state and sequence diagrams. Added current screenshots of web and activities.
Version 3.0	04/24/2012	Third Draft: Sequence diagrams updated and website screenshots updated.
Version 4.0	05/04/2012	Fourth Draft: Final activity and TheraTouch screenshots added and updated class diagrams.

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Introduction

This document provides a detailed description of the TheraTouch system and all its components. The components include the DB, the TheraLink web application interface for the TheraLink system, and the TheraTouch framework.

1.1 Purpose

The purpose of TheraTouch is to create an interactive way to deploy tests for cognitive and physical rehabilitation. The TheraTouch system, combined with the touch surface, allows for the recording of data at multiple points of contact.

With the help of physical therapists at Texas Health Resources, activities useful to therapy clients have been developed to help in cognitive and physical rehabilitation. TheraTouch will be deployed at a THR facility to aid in this process.

1.2 Scope

TheraTouch allows mobility and portability of the administrative application. Activities will be able to be added with minimal code or DB changes.

1.3 Overview

TheraTouch, TheraLink and the DB are discussed in greater detail in the following sections.

Section 2 outlines the design constraints on the TheraTouch project.

Section 3 goes into detail on the system architecture.

Section 4 outlines the Database, the changes made, and the tables used.

Section 5 includes descriptions of main classes used in TheraTouch, as well as its sequence and state diagrams.

Section 6 includes descriptions of main classes used in TheraLink, as well as its sequence and state diagrams.

Section 7 provides descriptions on adding activities to the framework.

Section 8 provides description and images of the user interface for TheraTouch and TheraLink.

Section 9 provides definitions for terms used throughout the document.

2. Design Constraints

The design constraints are time and limited access to THR DB. TheraTouch is a senior design project and requires additional time outside of class for students to complete the project. We are also limited by the SPI data held by THR, so full integration into their system may not be possible on initial roll-out from our end. It may require integration by THR after installation.

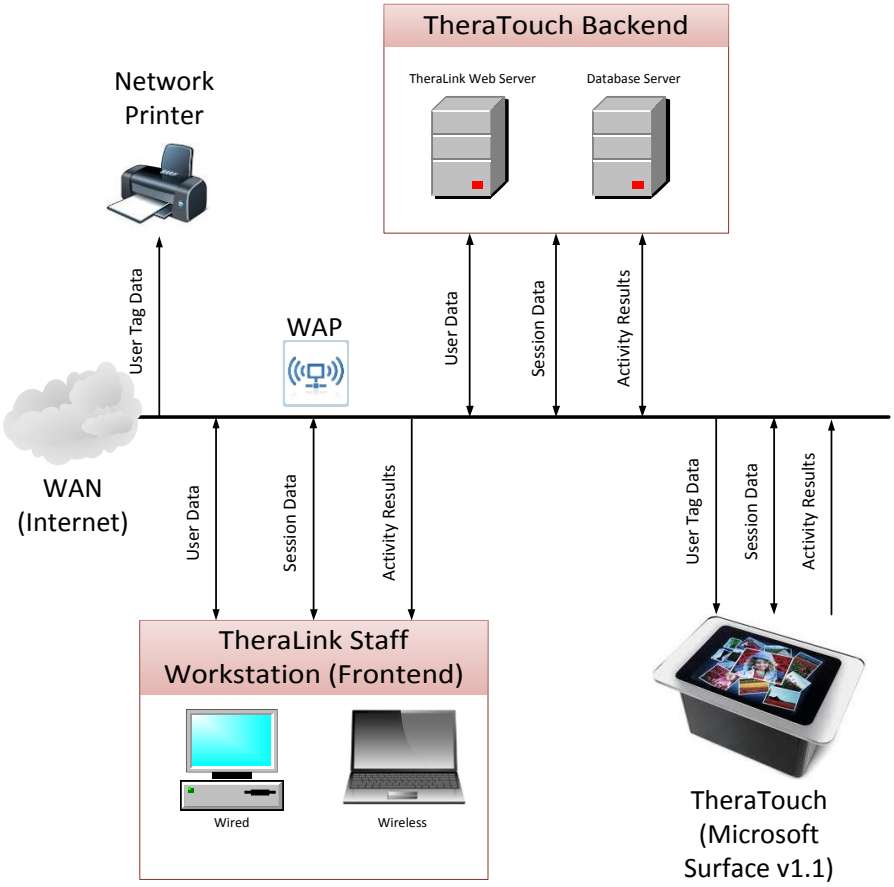
3. System Architecture

3.1 Components in the System

The TheraTouch system consists of three major components:

1. Microsoft Surface running the TheraTouch application
2. The TheraLink web application, accessible from a computer with an internet connection
3. The TheraTouch system database

3.2 Communication between Components

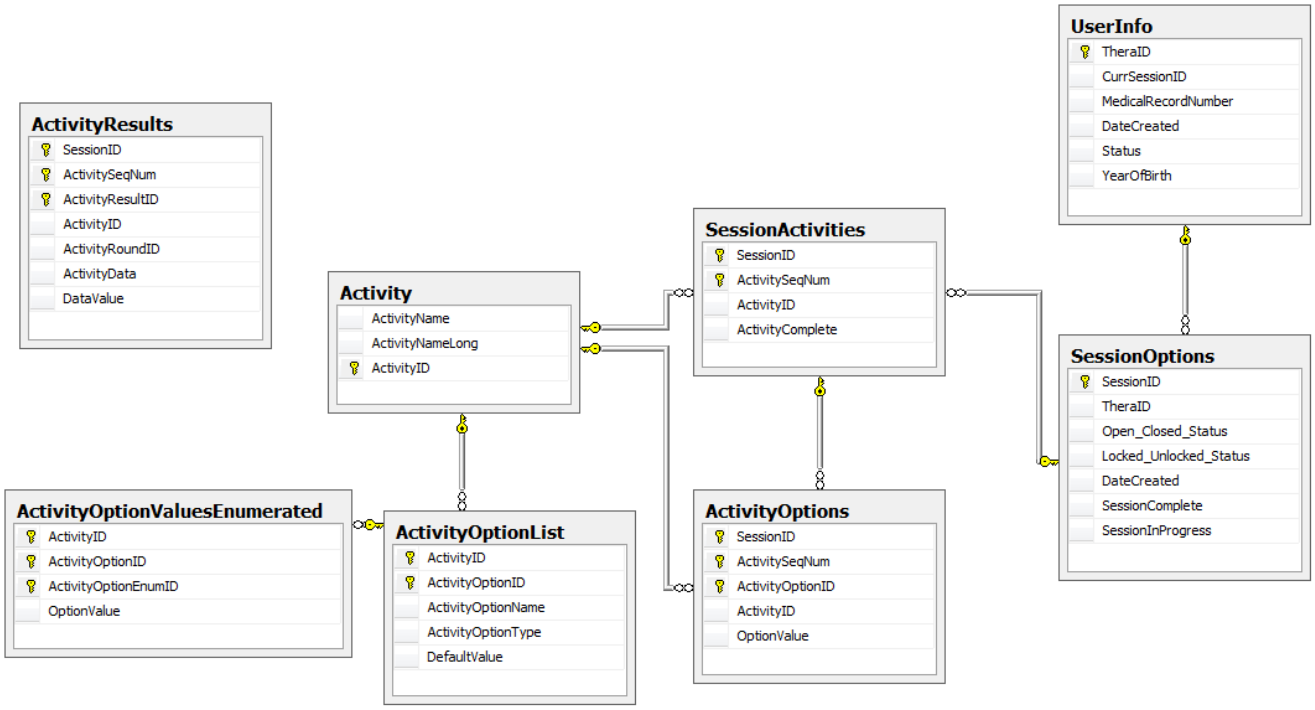


4. Database Design

4.1 Introduction

The database schema was taken from the HealingTouch project. It has been modified to fit the new requirements and uses for the TheraTouch project. Modification of the original project was necessary to allow therapists to add new activities easily and track their clients' progress.

4.2 Schema



4.3 Summary of Tables

The activity tables were made more generic to allow for easier implementation in adding new activities. All activity data is now saved in one table. All activity options are now stored in one table and have a unique activity ID.

UserInfo Table-This table stores basic information about the user.

Column	Description
TheraID -PK	Unique identifier of the user used by this project.
CurrSessionID	Stores the SessionID of the currently active session for the user.
MedicalRecordNumber	THR identifier of the user.
DateCreated	Date the user was added to the database.
Status	Flag to handle whether the user should be considered active. Either “Active” or “Inactive”.
YearOfBirth	The year that the patient was born.

SessionOptions Table-Relates a session to a user.

Column	Description
SessionID -PK	Unique identifier for this session of user therapy.
TheraID -FK	The user associated with this session. Key from UserInfo table.
Opened_Closed_Status	Flag of either “Opened” or “Closed” that specifies whether the session can be modified or not.
Locked_Unlocked_Status	Flag that specifies whether the session order is locked in the Surface Framework. Either “Locked” or “Unlocked”.
DateCreated	The date this session was created in the web application.
SessionComplete	Flag that indicates whether all activities in the session have been completed.
SessionInProgress	If the session is open on the TheraTouch framework, this flag is set to True.

SessionActivities Table -Relates activities in a session to a session.

Column	Description
SessionID-PK, FK	Identifies which session this record is for. Key from SessionOptions table.
ActivitySeqNum -PK	Identifies the index of the activity within Session. Used with SessionID to uniquely identify an instance of an Activity.
ActivityID -FK	Identifies which Activity this record is for. Key comes from the Activity table.
ActivityComplete	Flag of “True” or “False” that specifies if this instance of an Activity has been completed on the Surface.

Activity Table -Stores basic information about each activity that is available on the Surface.

Column	Description
ActivityID -PK	Unique identifier for the activity.
ActivityName	The title of the activity used by the Surface.
ActivityNameLong	The full title of the activity used by UI elements in the Web Application.

ActivityOptions Table -Stores information about the options used for an instance of an Activity in a particular Session.

Column	Description
SessionID –PK, FK	Identifies which session this record is for. Key from SessionActivities table.
ActivitySeqNum –PK, FK	Identifies which instance of Activity within the Session this record is for. Key from SessionActivities table.
ActivityOptionID -PK	Identifies which option is being specified by this record.
ActivityID -FK	Which general Activity this option comes from. Key from Activity table.
OptionValue	The value of the option, used by the Surface framework.

ActivityOptionList Table-Stores all the possible options for an Activity. Used by the Web Application when specifying the possible options to be used for an instance of an Activity in a Session.

Column	Description
ActivityID –PK, FK	Specifies which Activity this option is to be used for. Key from Activity table.
ActivityOptionID-PK	Identifier that is unique within the Activity, used as an artificial key to make each ActivityOption record unique.
ActivityOptionName	The name of the option, to be used in the web application.
ActivityOptionType	The type of value that can be specified. Currently the only type is “Enumerated”.
DefaultValue	The default value to be used when creating an instance of an Activity within a Session.

ActivityOptionValuesEnumerated Table-Stores all the possible values for options for an Activity. Used by the Web Application when specifying the possible options to be used for an instance of an Activity in a Session.

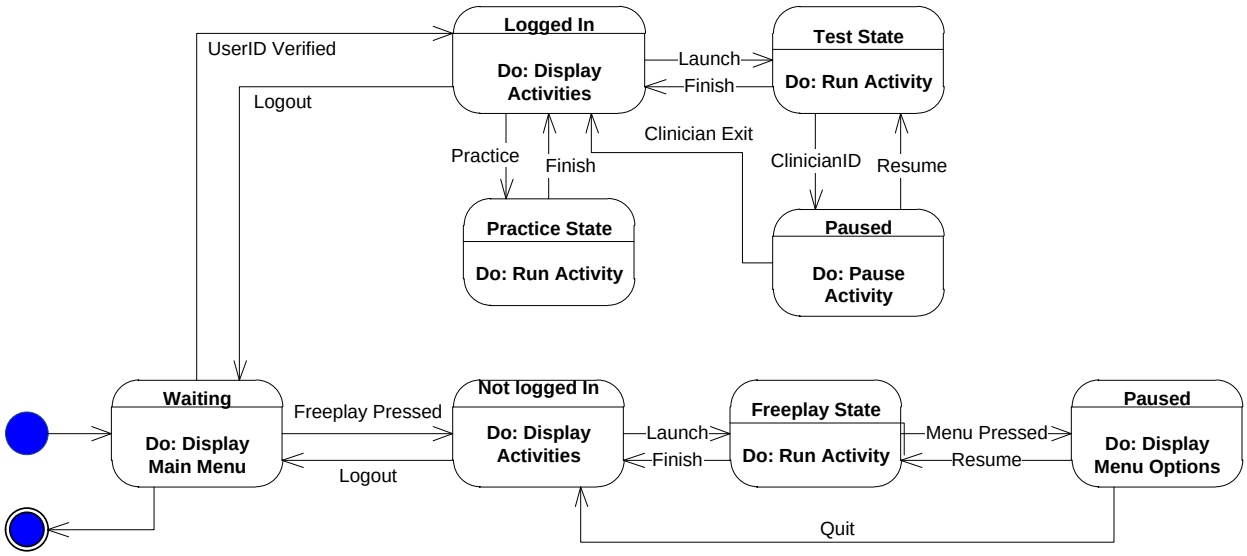
Column	Description
ActivityID –PK, FK	Specifies which Activity this option is to be used for. Key from ActivityOptionList table.
ActivityOptionID-PK, FK	Identifier that is unique within the Activity, used as an artificial key to make each ActivityOption record unique. Key from ActivityOptionList table.
ActivityOptionEnumID-PK	Identifier that is used as an artificial key to make each record unique.
OptionValue	A possible value that can be used when specifying the option for an instance of an Activity.

ActivityResults Table-Stores the results for activities that have been played on the Surface. Results are only stored for activities that are played as part of a session.

Column	Description
SessionID –PK	Specfies which Session this record is for. Key from Session Options table.
ActivitySeqNum -PK	Activities which instance of an Activity within a Session this record is for.
ActivityResultID -PK	Artificial key used to make the record unique.
ActivityRoundID	Indicates which round within the activity (if applicable) that this record is about. If the record is about the entire activity, the ActivityRoundID should be 0.
ActivityID	The Activity that this record is about. Key from the Activity table.
ActivityData	The name of the metric that this record is about.
DataValue	The value of the metric that was recorded while playing a Session.

5. Surface Design

5.1 State Diagram



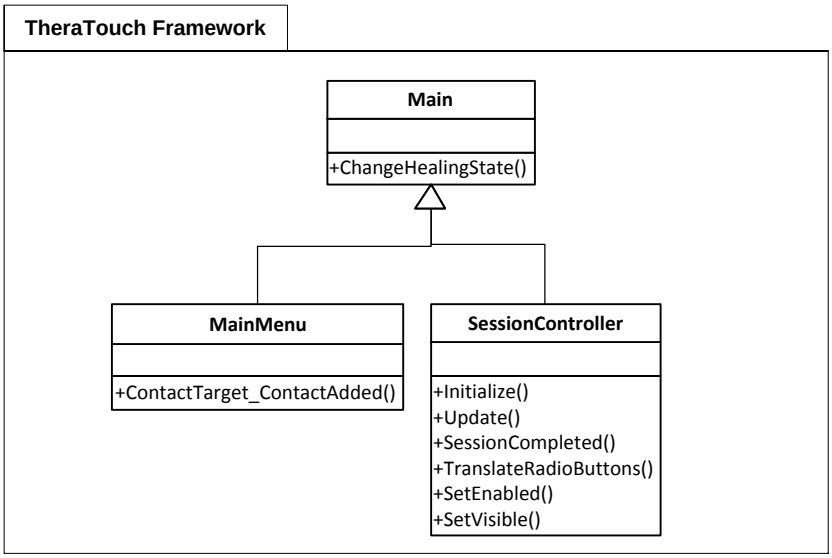
5.1.1 State Diagram Description

State	Description
Waiting	The Surface is waiting for user input. The Main Menu is displayed.
Logged In	The Surface is waiting for the user to select launch, practice, or logout. Pre-defined activities are displayed.
Practice State	The Surface runs the Activity in practice mode. Activity Options are set based on the Session. The Activity is displayed. Upon completion, no data is collected.
Test State	The Surface runs the Activity in test mode. Activity options are set based off the Session. The Activity is displayed. The Clinician can pause the activity with a clinician tag. Upon completion, data is collected and stored.
Paused	The Surface pauses the current activity, when a clinician tag is recognized. Options are displayed.
Not Logged In	The Surface is waiting for an Activity to be launch. All activities are displayed.
Freeplay State	The Surface runs the Activity in Freeplay Mode. Options are predefined as easy, medium, and hard. The activity is displayed.
Paused	The Surface waits for user input. The Activity Menu is displayed

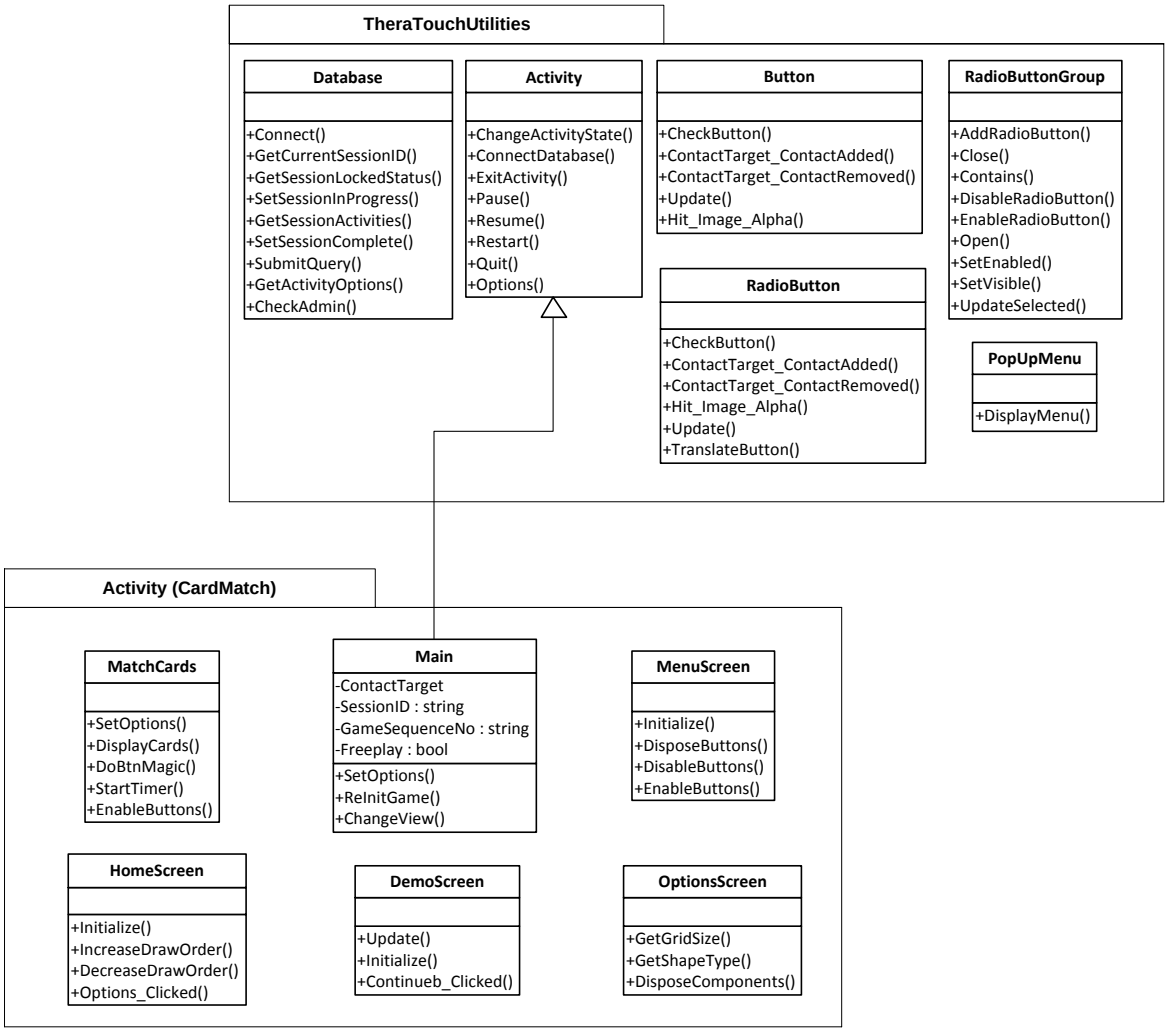
Stimulus	Description

Waiting	The user has placed a valid user tag on the Surface, and a Session is available.
Practice State	The user has logged in, selected an Activity, and pressed the practice button.
Test State	The user has logged in, selected an Activity, and pressed the launch button.
Paused	The clinician has placed a valid clinician tag on the Surface during an Activity.
Not Logged In	The user has pressed the Freeplay button.
Freeplay State	The user is in FreeplayHome, selected an Activity, and pressed the launch button.
Paused	In an Activity, during Freeplay Mode, the user has pressed the menu button.

5.2 Surface Class Diagram



5.3 Surface Activity Class Diagram



5.4 Surface Design Procedures

- The activity should have a Main Class
- Export the latest TheraTouchUtilities.dll to project references
- Extend the Activity class from your Main Class
- Use the utility methods contained in TheraTouchUtilities to implement database and other functionality

5.5 Surface Components

The Microsoft Surface utilizes infrared camera to detect touches and objects on the screen. The Surface projects its display using a 30-inch DLP projector. It runs on the Windows Vista operating system.

5.5.1 Activity Class

The Activity class is part of the TheraTouchUtilities.dll. It provides methods for controlling the activity such as Pause, Resume, Restart and ExitActivity.

5.5.2 Database Class

The Database class is part of the TheraTouchUtilities.dll. It provides methods for database connectivity as well as retrieving data and saving data from the database.

5.5.3 Main Class

The Main class has an object for the following classes, Database, MainMenu and SessionController. It uses the method ChangeHealingState to switch between the SessionController, MainMenu and Activity classes.

5.5.4 MainMenu Class

MainMenu class displays the title screen for TheraTouch. It also displays the Freeplay button. It will also detect if an user tag has been placed down on the surface. If so it will launch into SessionController in Session mode. If the Freeplay button or a user tag is placed down the SessionController class will be launched here as well.

5.5.5 SessionController Class

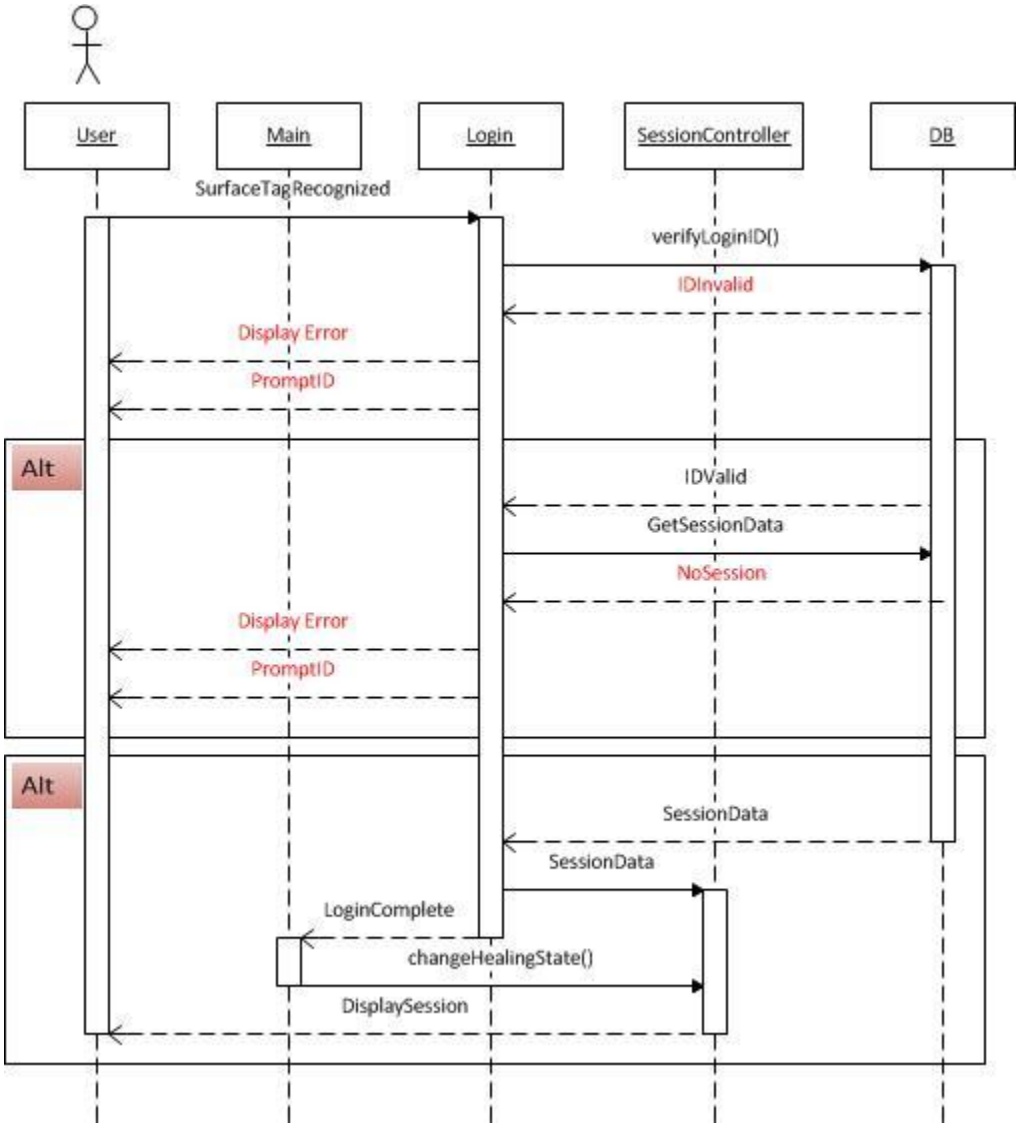
The SessionController creates a scrollable interface for users to select an activity from. If a user tag is placed down a session is launched and the SessionController will display only the icons for the activities that are stored for that particular session. If the Freeplay button is pressed it will display the selectable icon of all the current activities in TheraTouch.

5.5.6 TheraTouchUtilities.dll

TheraTouchUtilities is a .dll file that is referenced in TheraTouch and every Activity that is included in Theratouch. It includes a number of classes common to every activity in TheraTouch. These include classes for Buttons, Radio Buttons, Database Connections and a Pop-up menu.

5.6 Sequence Diagrams

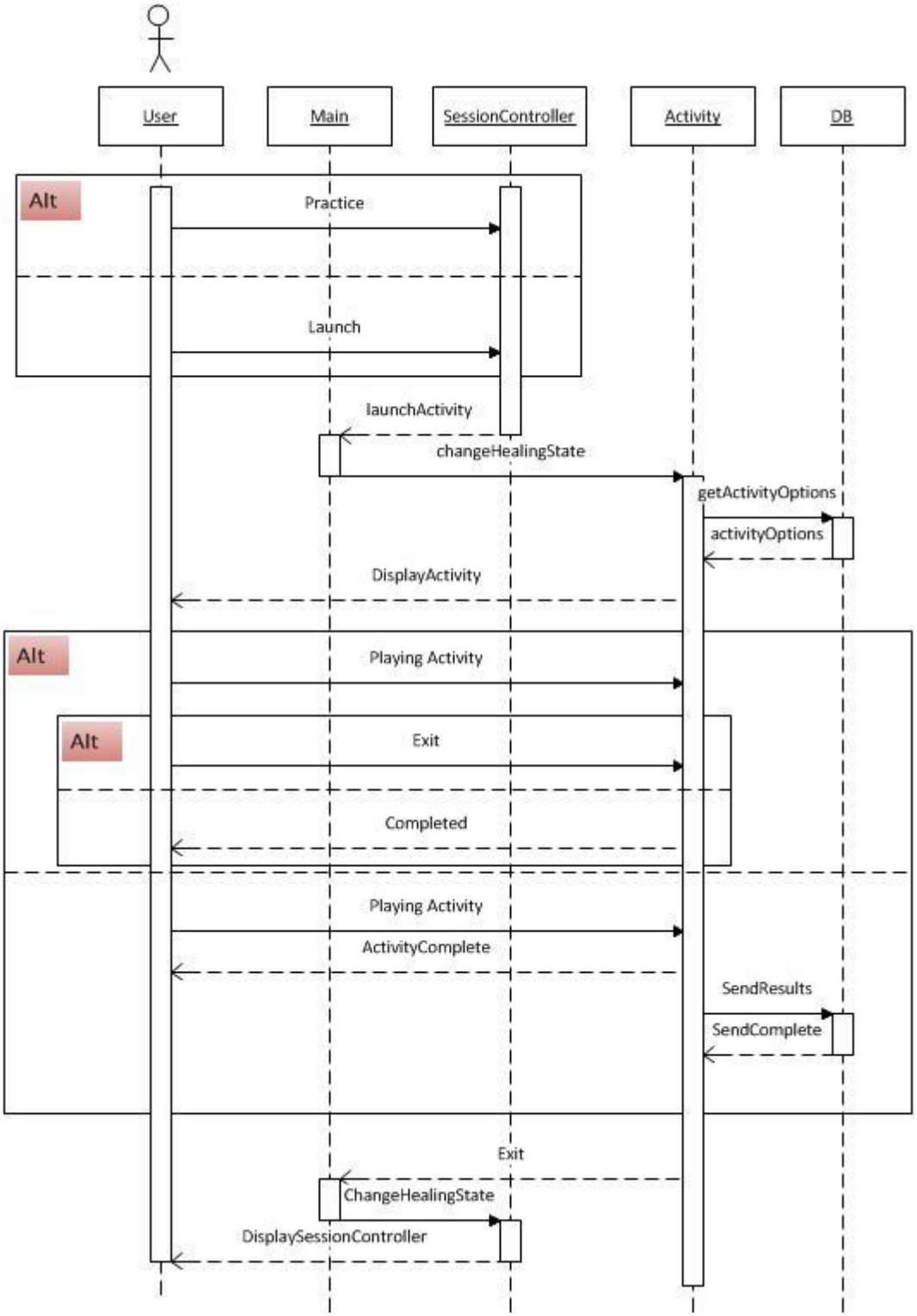
5.6.1 Login



5.6.1.1 Login Description

Actor/Class	Description
User	Places a valid user surface tag onto the surface.
Login	Sends the tag information to the DB class.
DB	Verifies the information on the database.
DB	• If DB returns invalid user ID The Login class will display an error and prompt the user. • Else proceed.
Login	Sends a message to DB to gather session information.
DB	• If DB returns NoSession The Login class will display an error and prompt the user. • Else DB will return session data to the LogIn class.
Login	Sends the session information to the SessionController class.
Login	Sends a message to Main that the login is complete.
Main	ChangeHealingState() to SessionController.
SessionController	Displays session to the user.

5.6.2 Session

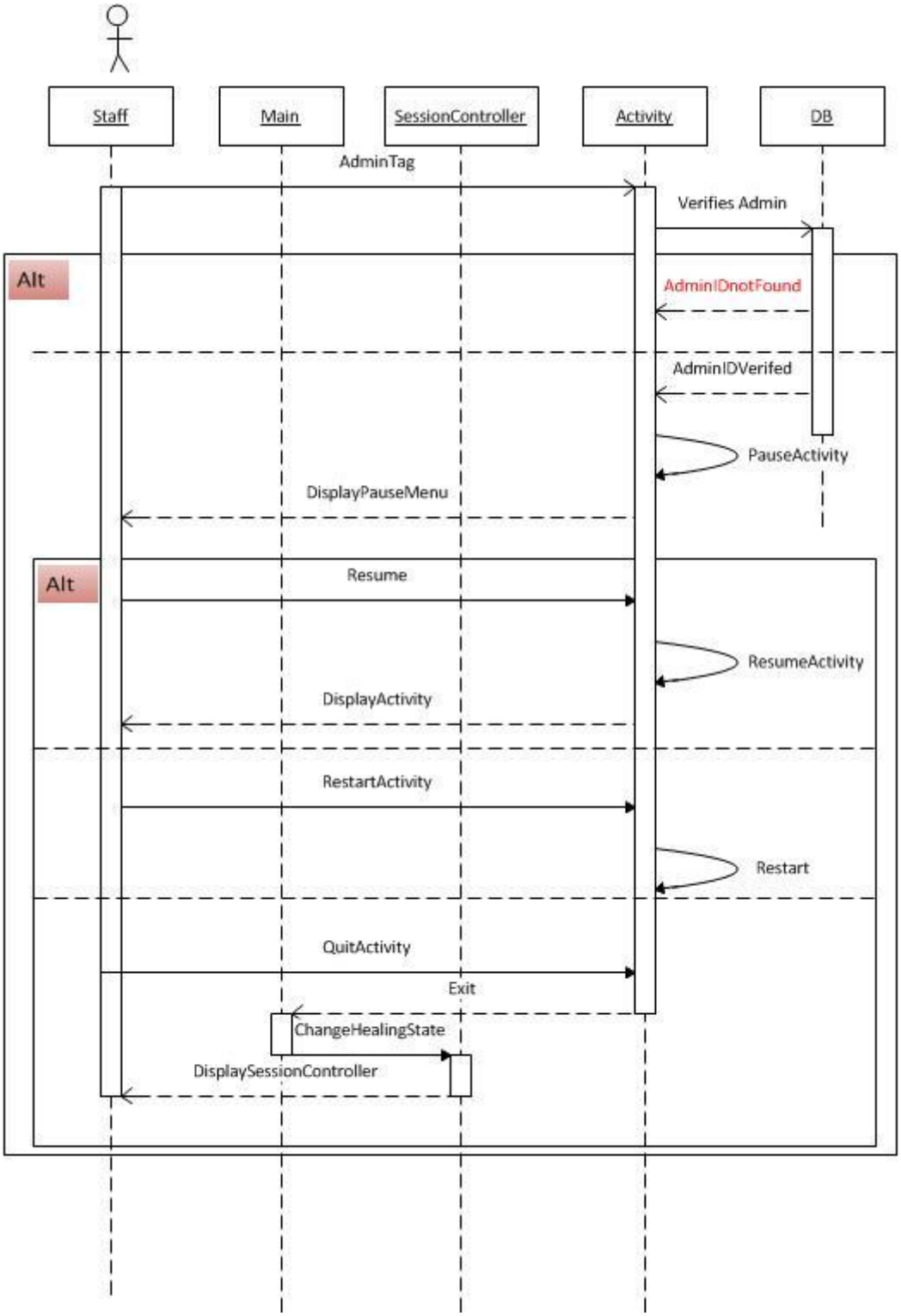

User
Main
SessionController
Activity
DB
Alt
Practice
Launch
launchActivity
changeHealingState
getActivityOptions
activityOptions
DisplayActivity
Alt
Playing Activity
Alt
Exit
Completed
Playing Activity
ActivityComplete
SendResults
SendComplete
Exit
ChangeHealingState
DisplaySessionController

5.6.2.1 Dynamic Session Description

Actor/Class	Description
User	Selects an activity and selects practice from the dynamic session screen.
SessionController	Sends a message to Main to launch the activity.
Main	ChangeHealingState() to the selected activity.
Activity	Sends a request to DB for stored options.
DB	Gathers the options information from the database.
Activity	Displays the activity to the user.
User/Activity	Either the user selects “quit” or the activity finishes and sends the message to Main.
Main	ChangeHealingState() to the SessionController.
SessionController	Displays the session screen to the user.

Actor/Class	Description
User	Selects an activity and selects practice from the dynamic session screen.
SessionController	Sends a message to Main to launch the activity.
Main	ChangeHealingState() to the selected activity.
Activity	Sends a request to DB for stored options.
DB	Gathers the options information from the database.
Activity	Displays the activity to the user.
Activity	Sends the activity information to DB.
DB	Sends the activity information to the database and returns a confirmation to Activity.
Activity	Sends exitActivity message to Main.
Main	ChangeHealingState() to SessionController.
SessionController	Displays the session screen to the user.

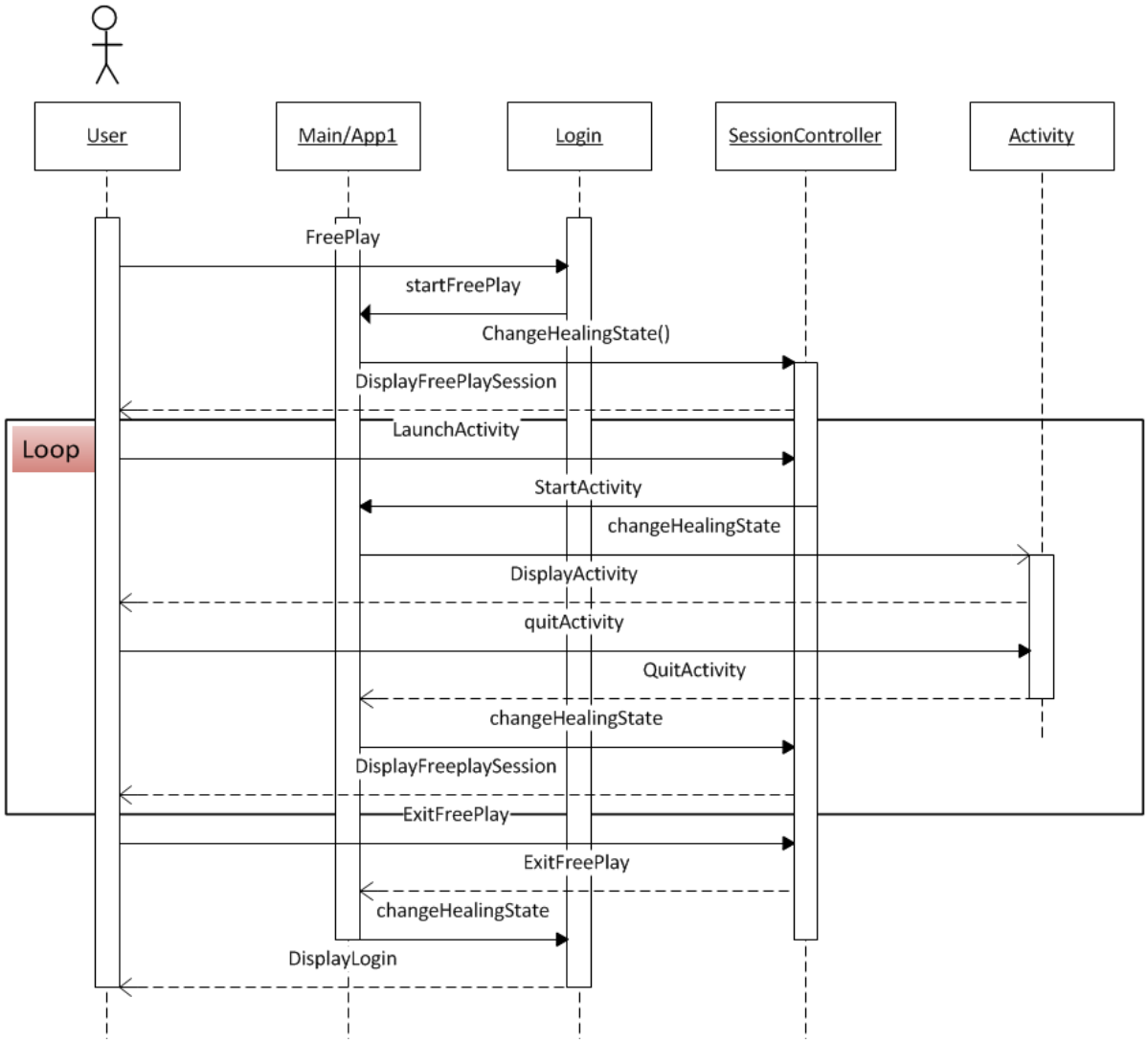
5.6.3 SurfaceAdminTag



5.6.3.1 SurfaceAdminTag Description

Actor/Class	Description
Staff	Places tag on the surface
Activity	Sends tag info to DB
DB	Verifies AdminTag
Activity	Pauses the activity and displays a pause screen
Staff	Selects “Resume”, “Restart” or “Exit”
Activity	Resumes, restarts, or exits the activity
Main	If “Exit” changehealingstate to sessioncontroller
SessionController	Display SessionController

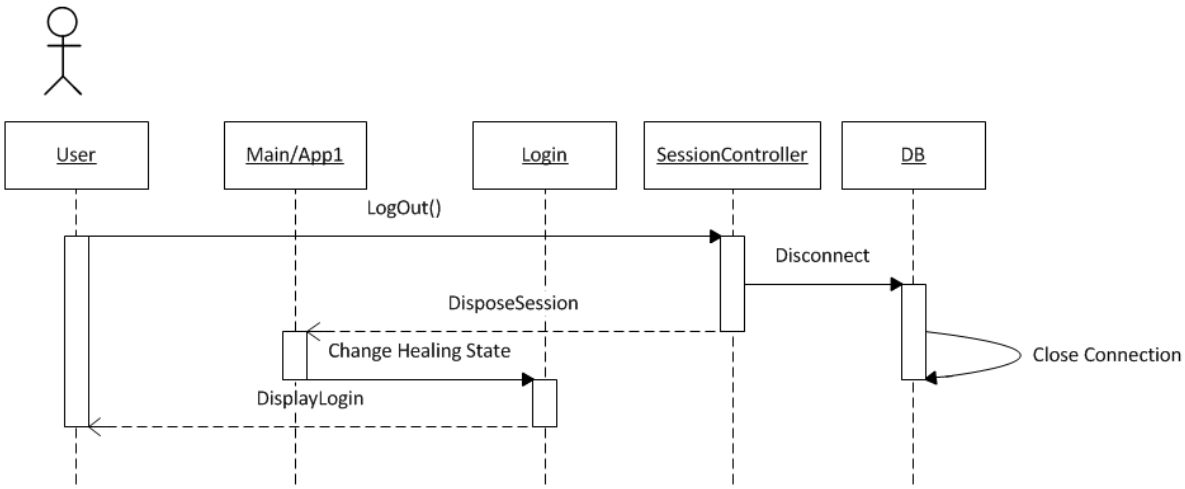
5.6.4 Freeplay



5.6.4.1 Freeplay Description

Actor/Class	Description
User	Selects Free Play from the surface main menu screen.
Main	Sends “startFreePlay” message to the Login Class
Main	ChangeHealingState() to the SessionController.
SessionController	Displays free play session to the user.
User	Selects “launch” to begin the activity.
SessionController	Sends message to Main that an activity has been started.
Main	ChangeHealingState() to a selected Activity.
Activity	Displays activity to the user.
User/Activity	Either the user selects “quit” or the activity finishes and sends the message to Main.
Main	ChangeHealingState() to the SessionController.
SessionController	Displays free play session to the user.
User	Selects “Exit” from the free play session menu.
SessionController	Sends a message to Main to exit the session.
Main	ChangeHealingState() to Login.
Login	Displays the surface main menu screen.

5.6.5 Logout



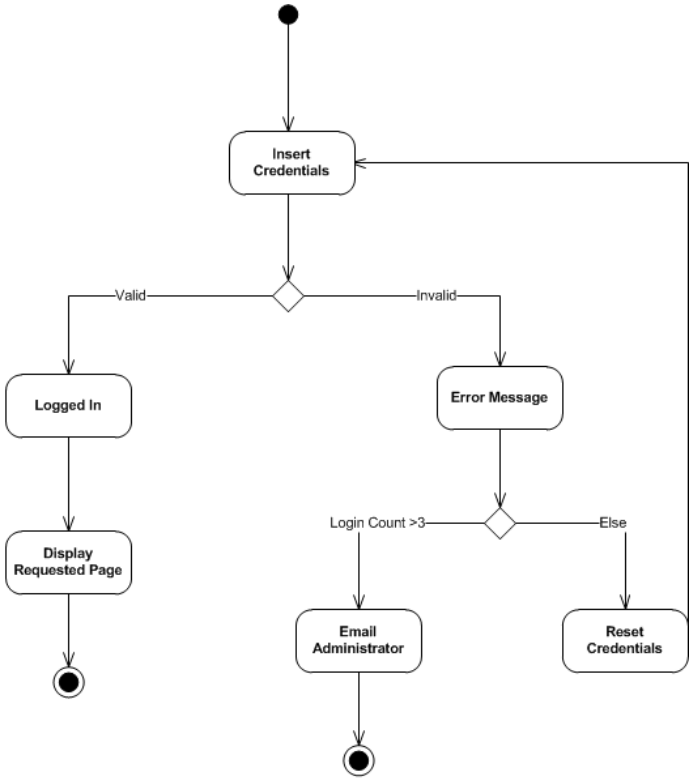
5.6.5.1 Logout Description

Actor/Class	Description
User	Selects Logout to the SessionController.
SessionController	Sends a request to DB to logout the user.
SessionController	Sends a request to dispose of the session to Main
Main	ChangeHealingState() to Login.
Login	Displays the surface main menu screen to the user.

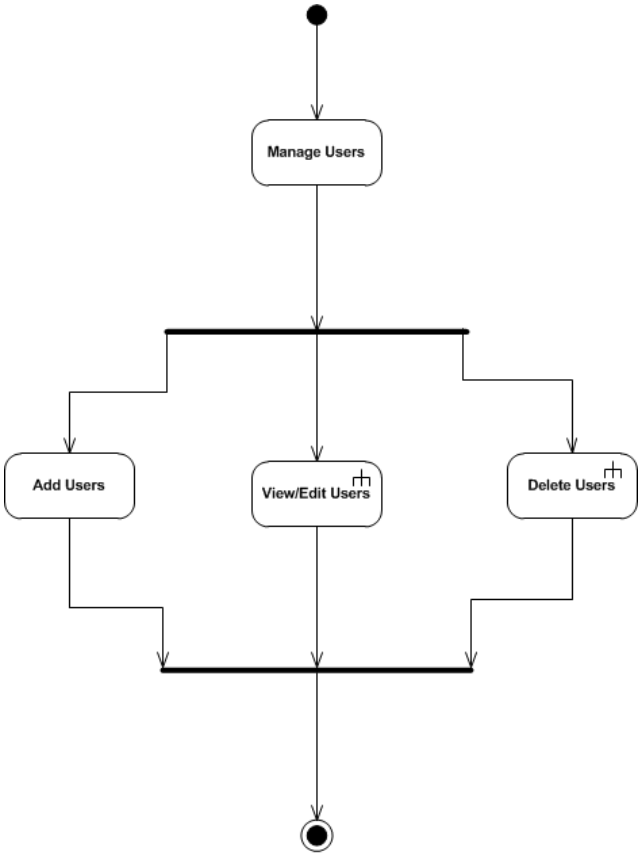
6. Web Application Design

6.1 Activity Diagrams

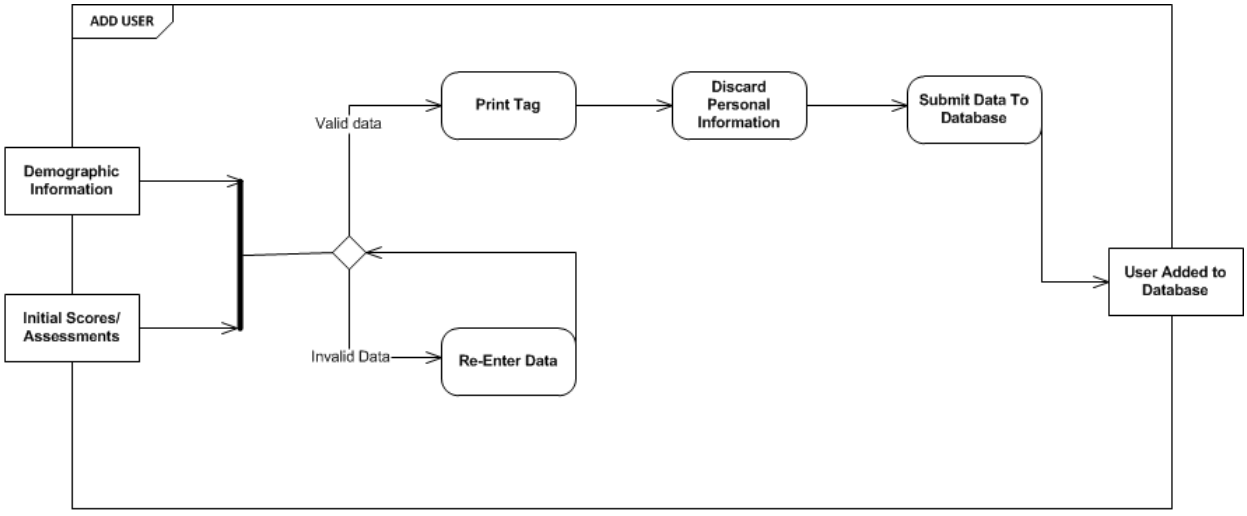
6.1.1 Login



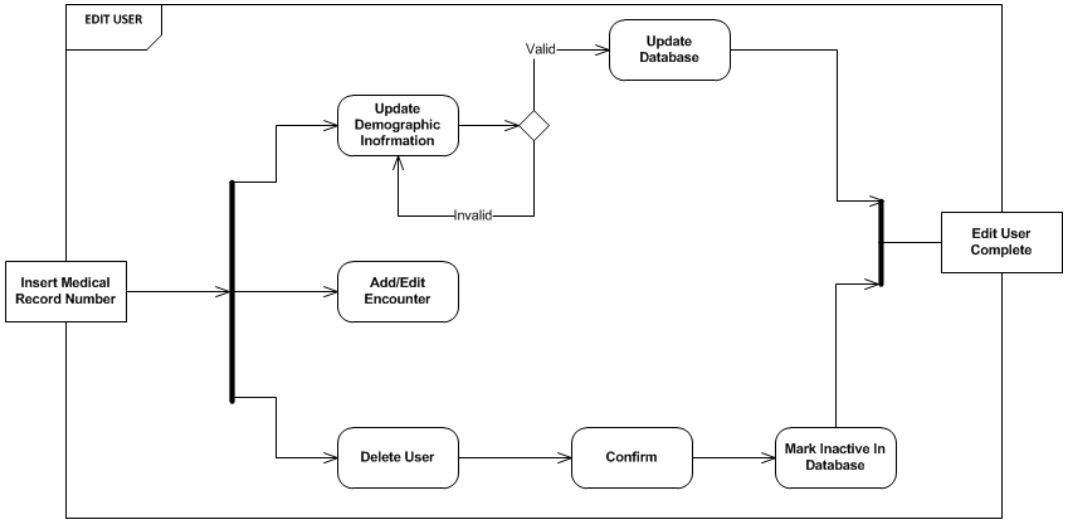
6.1.2 Manage Users



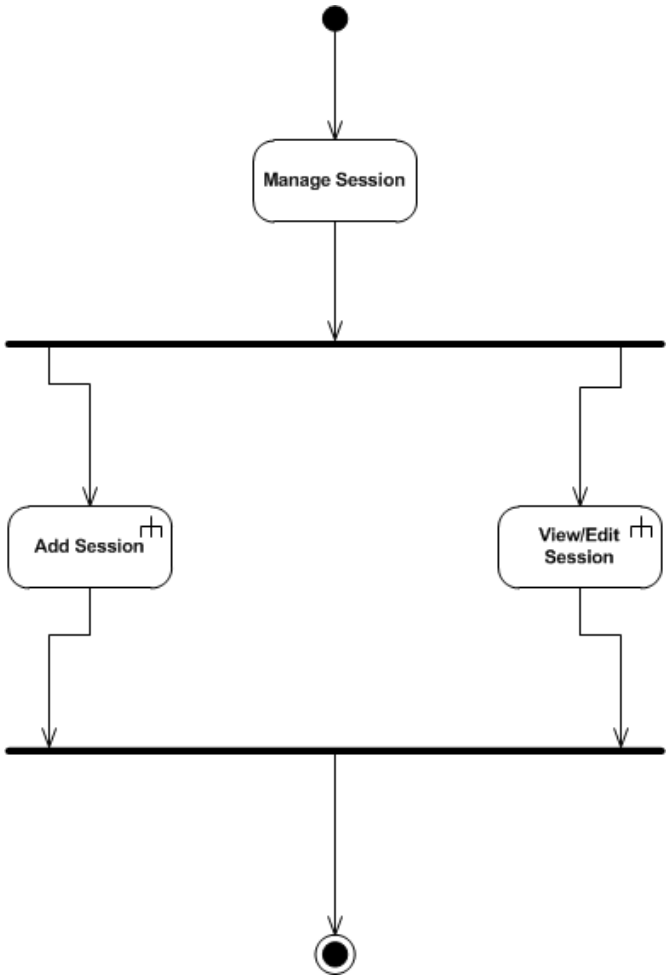
6.1.2.1 Add Users



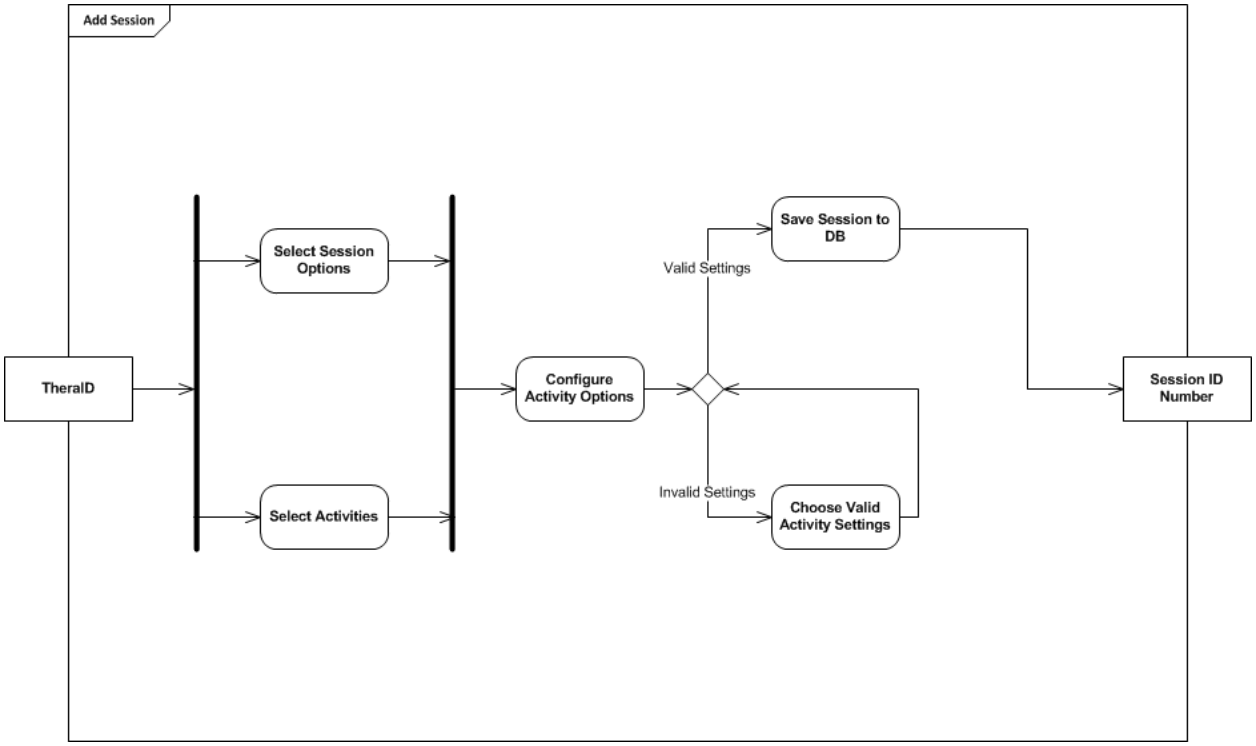
6.1.2.2 Edit Users



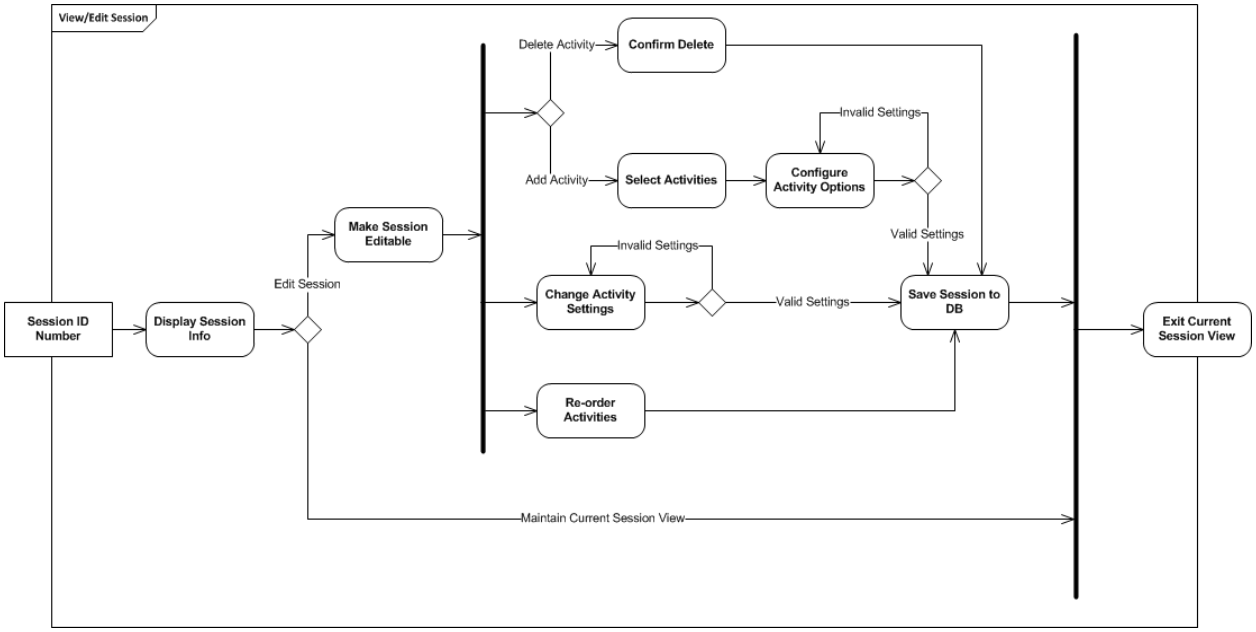
6.1.3 Manage Session



6.1.3.1 Add Session



6.1.3.2 View/Edit Session

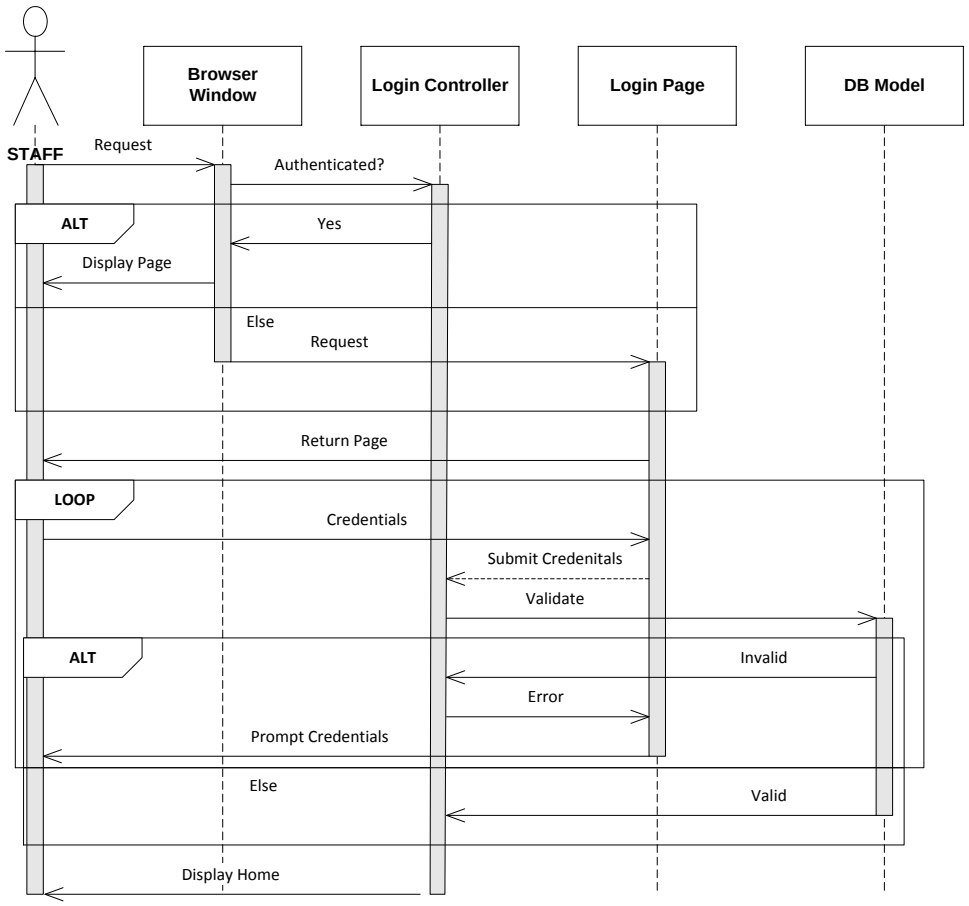


6.2 Web Application Components

- User Management
  - Add New User

- Session Management
  - Add New Session
  - Edit Session
  - Copy Previous Session
- Report Management
  - Time/Accuracy Reports
  - User Progress Reports
- Administration
  - Add New Employee User
  - Edit Employee User Roles
  - Print Employee User Tag
  - Reprint TheraTouch User Tag
  - Edit TheraTouch User
  - Reset Session In Progress

6.3 Sequence Diagrams



7. Activity Interface

7.1 Adding an Activity to the Database

To add an activity to the database, insert the name of the activity into the activity table, where it lists all of the playable activities. You must also add all of the activity's options into the activity options table, which lists all of the different options of each activity.

7.2 Adding an Activity to TheraTouch

7.2.1 Preconditions

Before you can add an activity to the framework, it must extend the activity class and must contain a create method, which will be called when the activity needs to be created. If the activity satisfies these conditions, it can be added to the framework.

7.2.2 Adding the Activity to the Framework

To add an activity, first the activity needs to be included in the project folder. Once it's there, the name of the activity (its name in the activity table) must be added as a new case to the switch in the launch activity method, which resides in the session controller class. The updated TheraTouch will then need to be redeployed to the Surface.

7.3 Adding an Activity to TheraLink

To add an activity to TheraLink, the data models will need to be updated after the changes to the database have been made. The TheraLink application will then need to be redeployed to the server.

8. User Interface

8.1 Surface Interface Introduction

Below are the different states of the TheraTouch portion of the project.

8.2 Surface

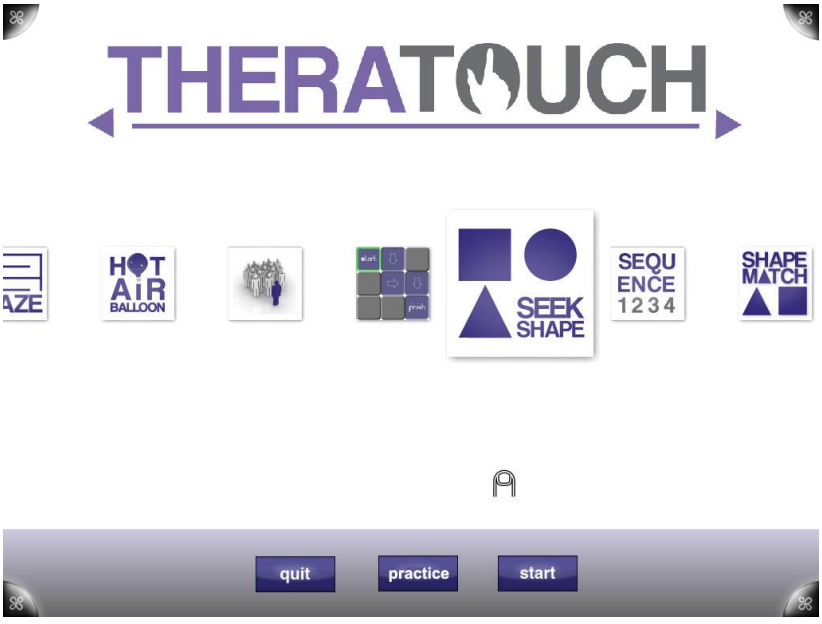
THERATOUCH Home Screen

- Press the free play button to go to the activity home screen.
- An admin tag can be placed on the screen to launch the session activity screen.

TheraTouch Free Play Activity Screen

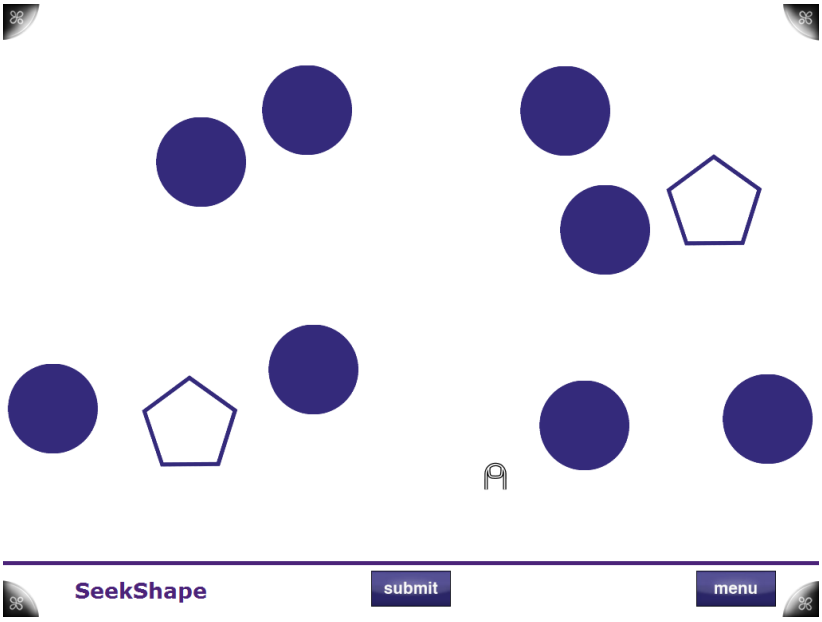
- Press activity icon to select that activity.
- Start button will launch activity and take user to activity start screen.
- Quit button will take you to the TheraTouch home screen.

TheraTouch Session Activity Screen



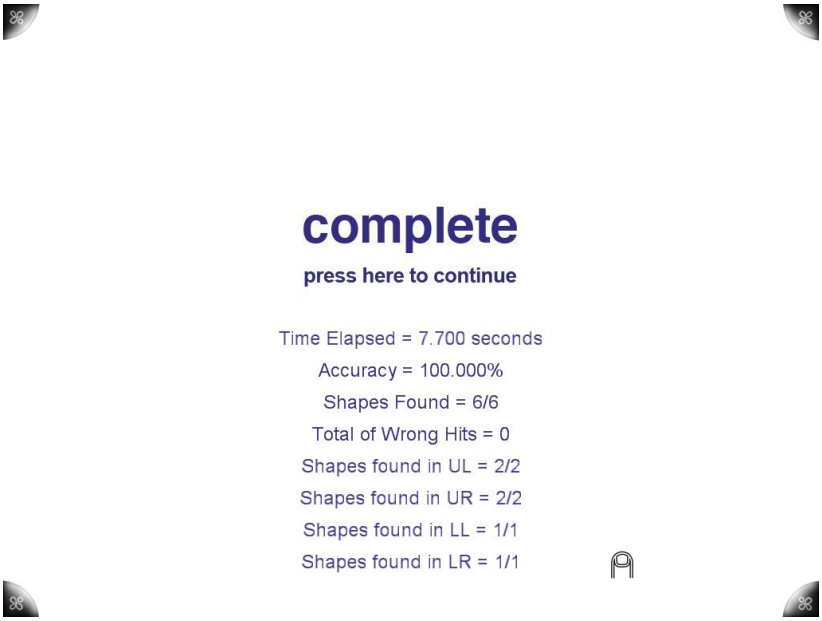
- Press activity icon to select that activity.
- Practice button will launch activity and take user to activity start screen.
- Start button will launch activity and take user to activity start screen.
- Quit button will take you to the TheraTouch home screen.

Activity Screen



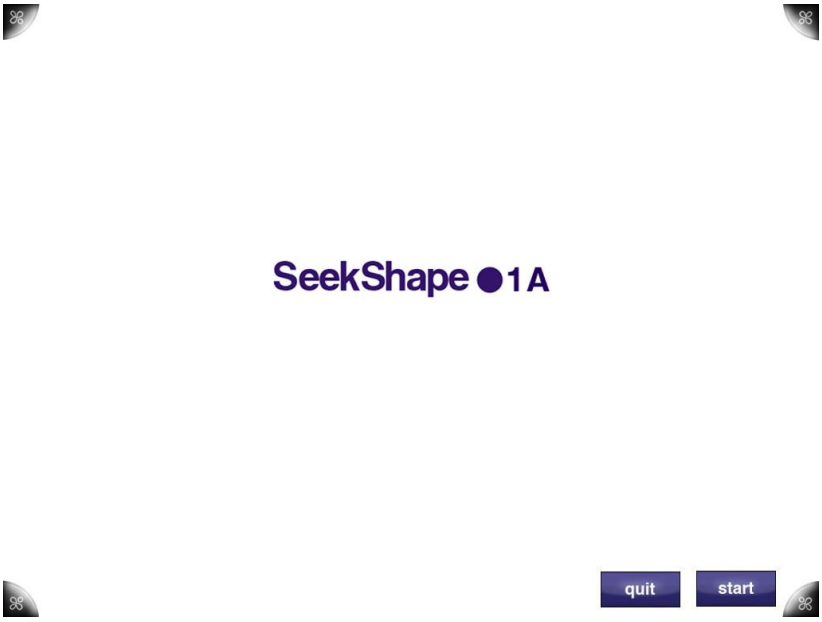
- When an activity finishes it will go to the activity complete screen.
- Menu button will take the user to the menu screen.

Activity Complete Screen



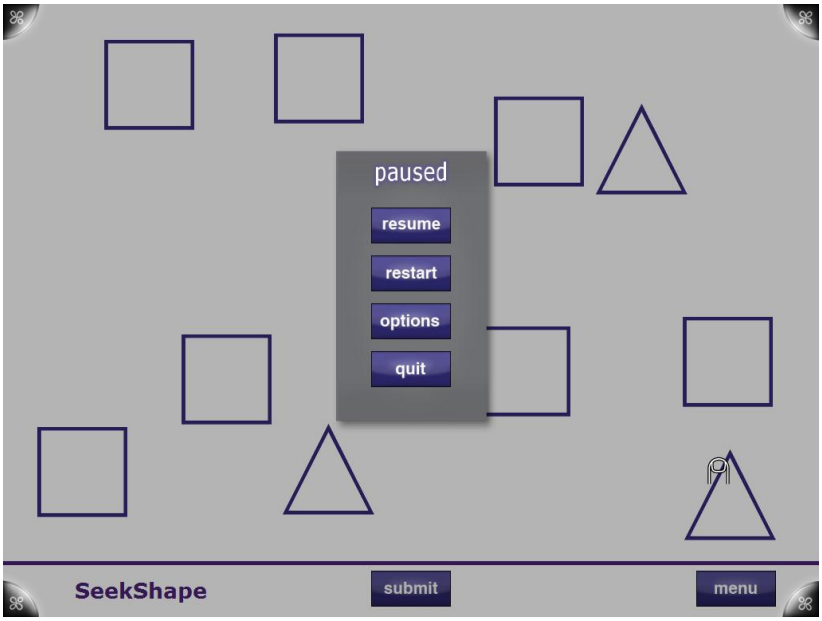
- Data stored in database once activity completes.
- Results are not displayed when activity completes during a session.

Activity Start Screen



- No data stored in the database during practice mode.
- Quit button will take user back to session home screen.

Menu Screen



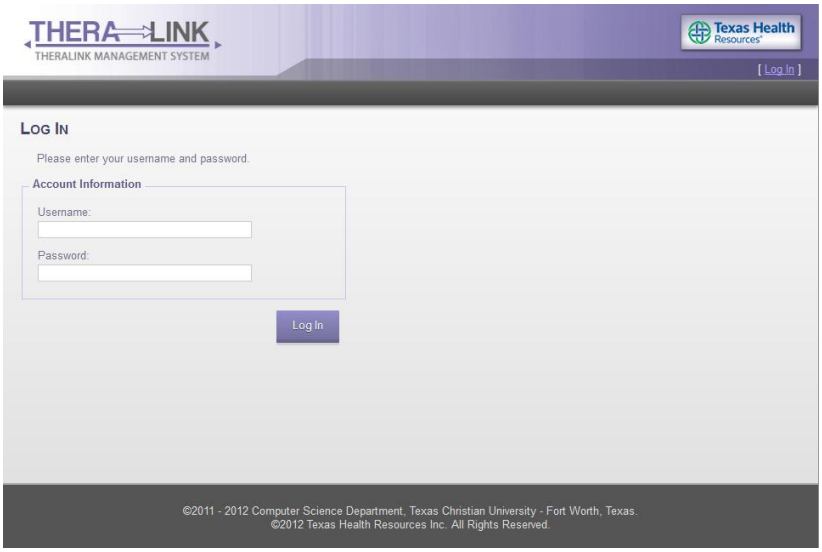
- Resume button starts activity from point when Menu button pressed.
- Restart button will refresh the activity.
- Will take you to the activity home screen.

8.3 TheraLink Introduction

TheraLink is the web application design that serves as the clinician interface with the DB and TheraTouch application. TheraLink will allow clinicians to manage users, sessions, and to perform administrative tasks related to managing staff roles and user statuses.

8.4 Web Application

Login Screen

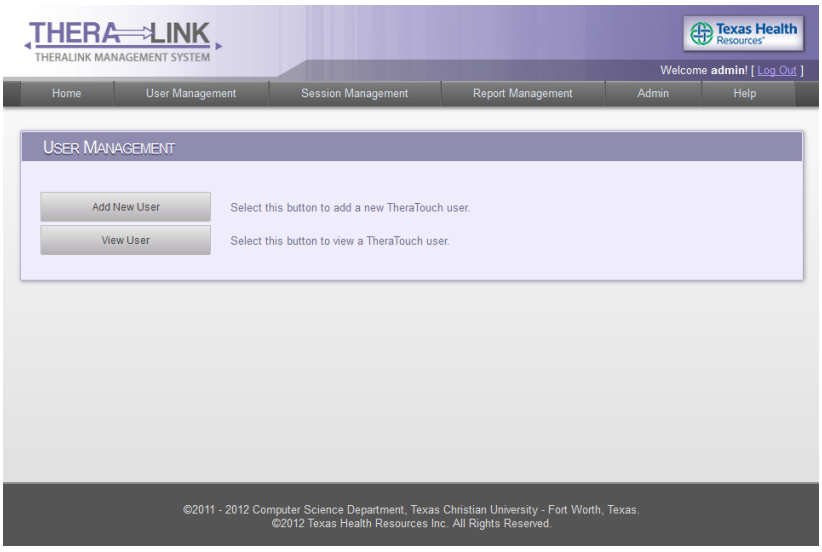


- This is the login page, which is the first screen present when accessing the portal. It will also be displayed when trying to go to any page that requires a permissions level, or when pressing the login button.
- To add a new staff, a current staff member must be logged in and have the appropriate permissions for adding new staff. This staff member will then go to the admin link in the navigation menu.
- The staff member should enter their username and password, and click the Login button to log into TheraLink.

Home Screen

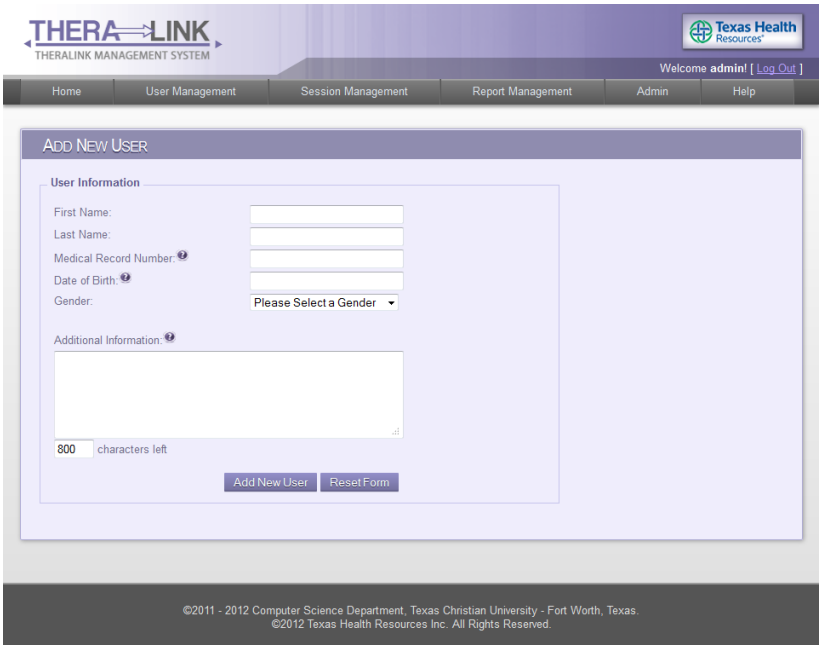
- The home screen is the first screen displayed after a successful login attempt. It serves as a welcome screen and gives a brief overview of the navigation.

User Management Screen



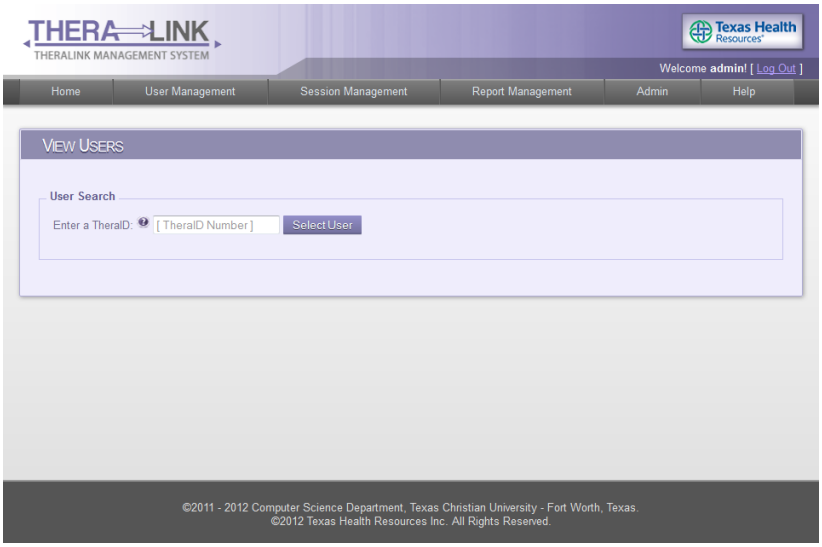
- To get to this page, click user management from the navigation menu.
- Clicking the Add User button will take you to the add user page.
- Clicking the View/Edit User button will take you to the View/Edit User page.

Add New User Screen



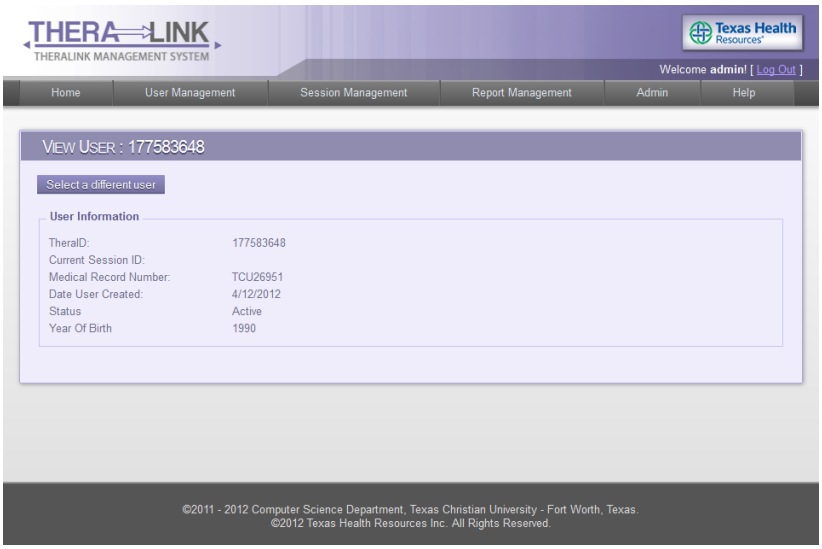
- To get to this page, hover over User Management in the navigation menu and select Add User, or select the Add User button on the user management page.
- All field names except first name, last name, and date of birth will be populated from a database table. If a field doesn't apply to a user, the staff can leave it blank. First name, last name, and date of birth will be hard-coded into the form, because these fields are not saved in the database.
- Clicking the Save and Print ID Tag button will save all data except first name, last name, birth day and month to the database. It will print an ID tag and prompt the user with a dialog box asking if the tag printed correctly. The staff can select Reprint Tag to reprint the tag, or select finish to save the user and return to user management page. Clicking the Reset Form button will set all the field values to empty.
- To cancel this action, click any of the other links in the navigation.

View Edit User Screen



- To get to this page, click Edit User on the user management page, or hover over the user management link and click View/Edit User from the drop-down menu.
- A drop-down menu will display with a list of all the user IDs. Once the user ID is selected, press the Edit Selected User button.

View User Screen

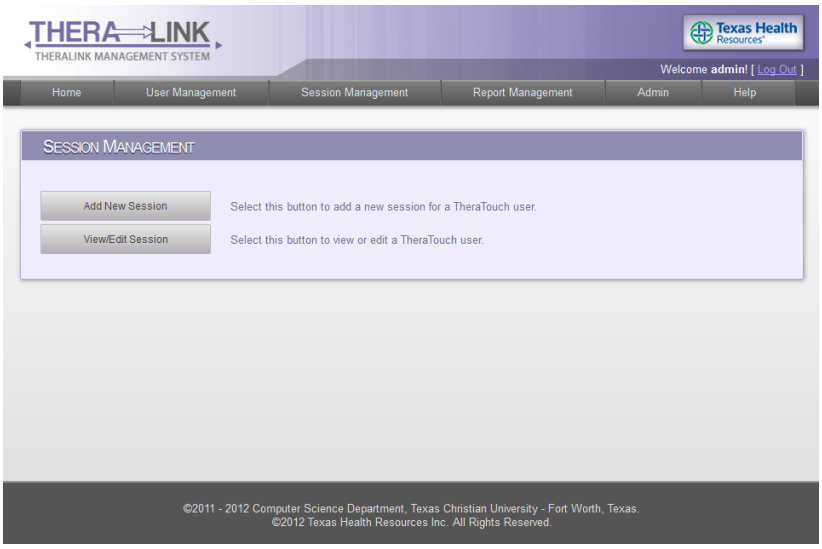


- To get to this page the Edit Selected User button must be clicked. Then the Edit Value button must be clicked.

Activate User/Deactivate User

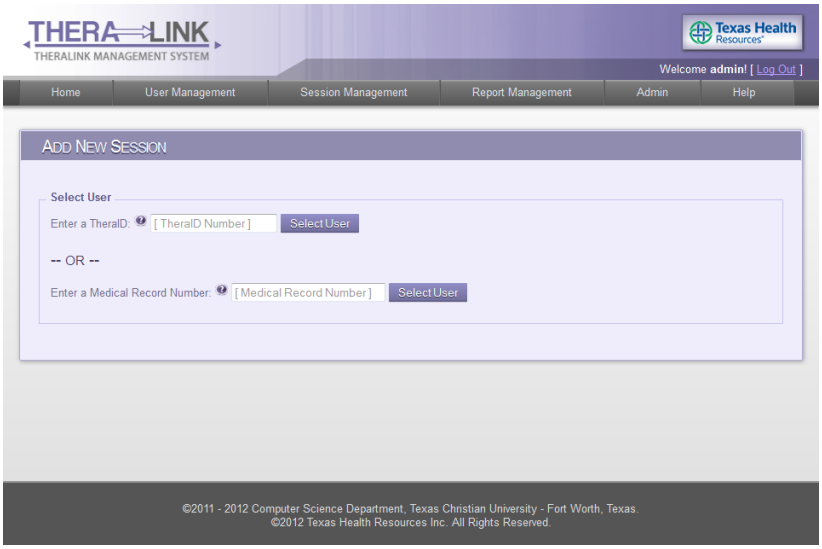
- To get to this page, click Admin from the navigation menu.
- Then click Edit TheraTouch User button will take you to this page.
- Having the users TheraTouch id one can activate or deactivate them.

Session Management Screen



- To get to this page, click Session Management from the navigation menu.
- Clicking the Add New Session button will take the staff member to the Add New Session page.
- Clicking the View/Edit Session button will take the staff member to the View/Edit Session-Select User page.

Add New Session Screen

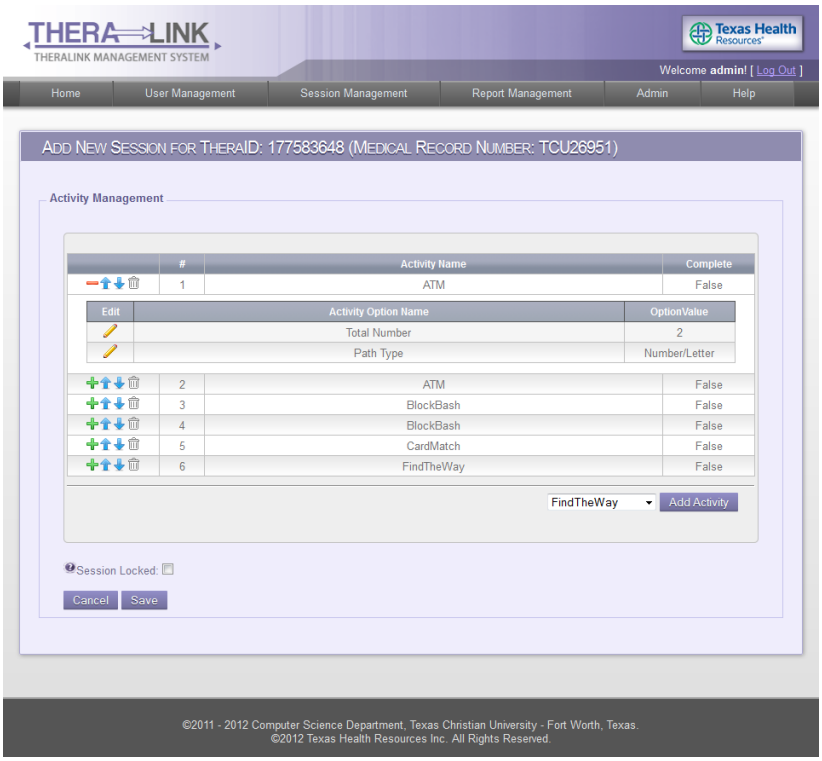


- To get to this page, click Add New Session on the session management page, or hover over the Session Management link and click Add New Session from the drop-down menu.
- Select a user from the drop-down menu containing all user IDs, or enter a value in the search field and click the Search button.
- Clicking on the Search button will display a table with all search results below.

Edit Screen

- The staff will get to this page after selecting a user from the View/Edit Session-Select User page.
- A drop-down menu displays all the current IDs staff can select from.
- There will be one Current Session that the staff can edit or view.
- This page will also list all of the previous sessions. These sessions can be viewed from here to display the results or activity options that were used.

Edit Session, Add New Activity Screen

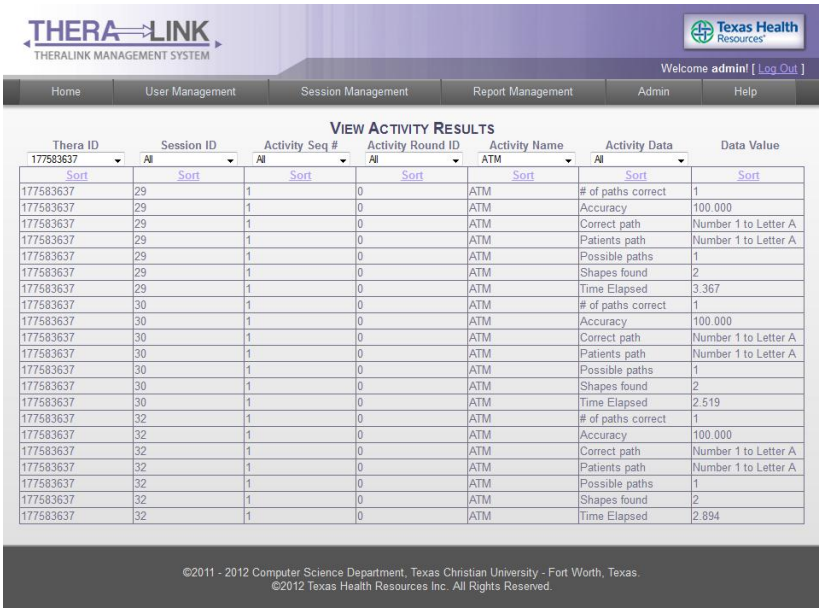


- Click the Add Activity button to add activities to the interactive table. When the staff clicks this button, it will add a new activity row to the table.
- To edit an activity that was just added, the plus icon must be clicked.
- When finished setting up the activities, click the Save button to save the session to the database. If the Cancel button is pressed, the staff will return to the session management page.

Edit Activity in Session Screen

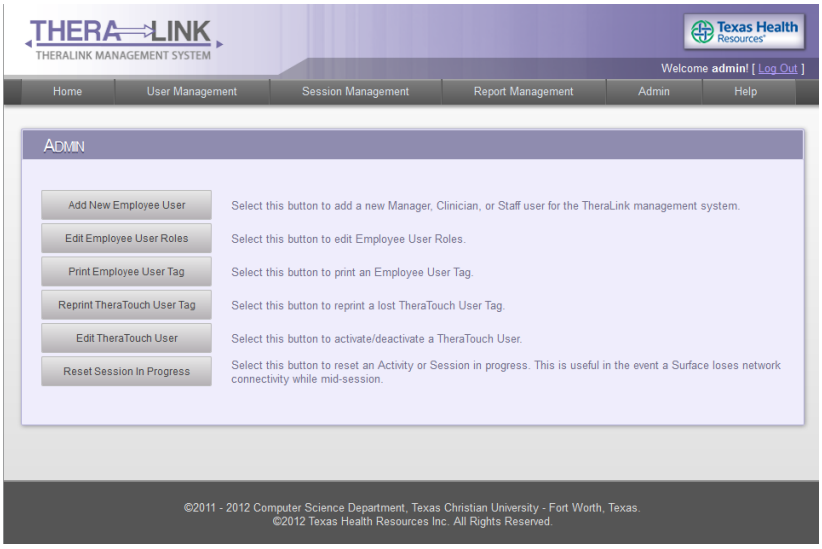
- Click the Plus icon to open a pop-up with that session's activity table. The staff member can edit options here. When the staff member clicks the Edit pencil button the drop-down menu will appear beneath each option. Click the green check-mark icon to save the edit.
- To delete an activity, press the trash can icon to remove it from the session.
- To change the order in which an activity is played, press the either the up or down arrow icons.

Report Management Screen



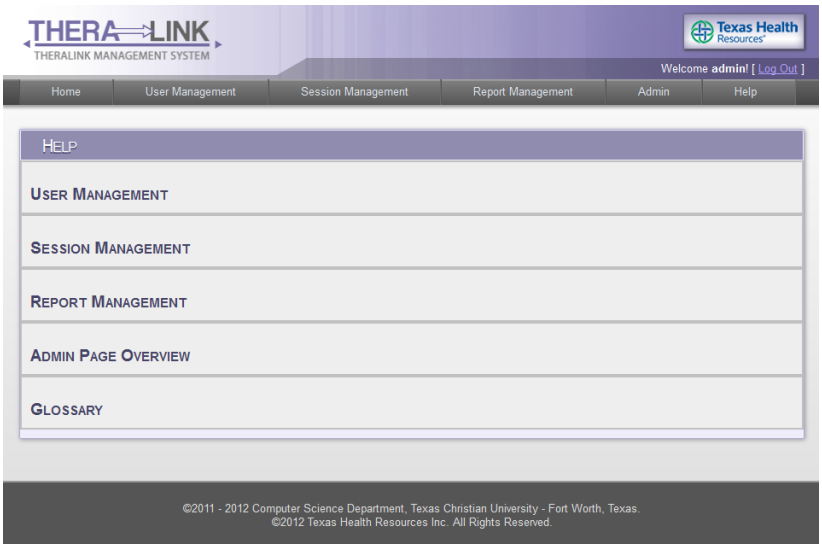
- To get to this page, click the Report Management link in the navigation bar.
- This page will display all the data collected from each session that has been completed.
- This page allows the data to be sorted by Session ID, Activity Sequence #, Activity Result ID, Activity Name, and Activity Data.

Administrative Functions Screen



- The Add New Staff button will add a new staff member to the database. The permission level will need to be specified.
- The View/Edit Staff button will edit or view a current staff member.
- Reprint User ID Tag will bring up a form to reprint a User's ID tag. First name, last name, and data of birth will need to be re-entered.

Help Screen



- To get to this page click the Help link in the navigation bar.
- The User Guide button will open the web application user guide in a new window.
- The Contact Us button will have a list of THR IT contacts that are in charge of maintaining the application.

9. Glossary of Terms

CITE – Computer Information Technology

Cognitive – Cognitive refers to a scientific term that means mental processes, cognition. Thus, cognitive therapy is therapy that helps exercise the mental ability of people.

Cognitive Contact – Team name for team working on TheraTouch project.

DB – Database

HealingTouch – The 2010/11 Senior Design Project.

HIPAA – Health Insurance Portability and Accountability Act of 1996, it protects health insurance coverage for workers and their families when they change or lose their jobs.

Microsoft Surface – A multi-touch tabletop computing device that uses gesture recognition to allow users interact with the machine.

Neuromuscular – Neuromuscular refers to the ability of the brain to control the body's muscles through the nervous system. Neuromuscular therapy is exercising the brain's ability to do this after it has been damaged, most likely through some sort of injury.

Report specs – The specs of a report are the parameters, the query, and the description of what that report does.

Report results – The actual data from the execution of the report that displays to the user.

SDK – Software Development Kit: A set of development tools for a specific software package.

Simulator – In this context, a simulated Microsoft Surface environment used in conjunction with Visual Studio

SPI – Sensitive Personal Information

TCU – Texas Christian University

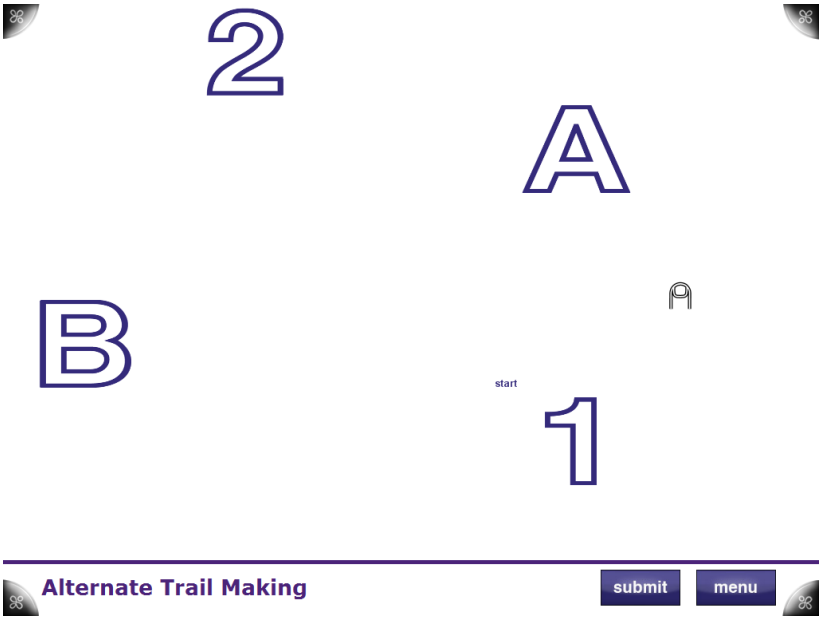
TheraLink – The name of the clinician workstation application developed by Cognitive Contact

TheraTouch – The name of the Surface application developed by Cognitive Contact *(also is used to refer to the overall system)*

THR – Texas Health Resources

Appendix A Activity Prototypes

9.1 Alternate Trail Making



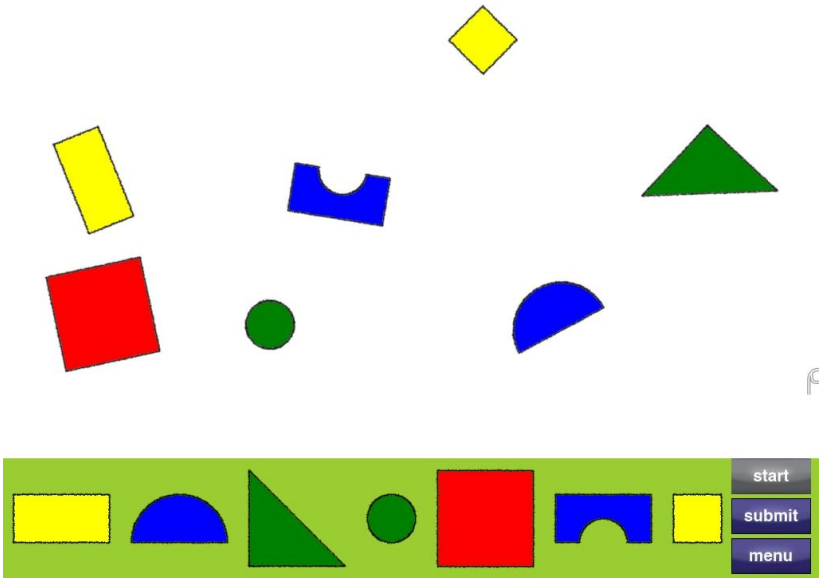
- Shapes appear on screen
- User must draw a line/connect the number 1, to the letter A , then the letter A to the number 2, then then the number 2 to the letter B

- Shapes appear on screen
- Once the last Letter in the sequence is highlighted the user will press submit

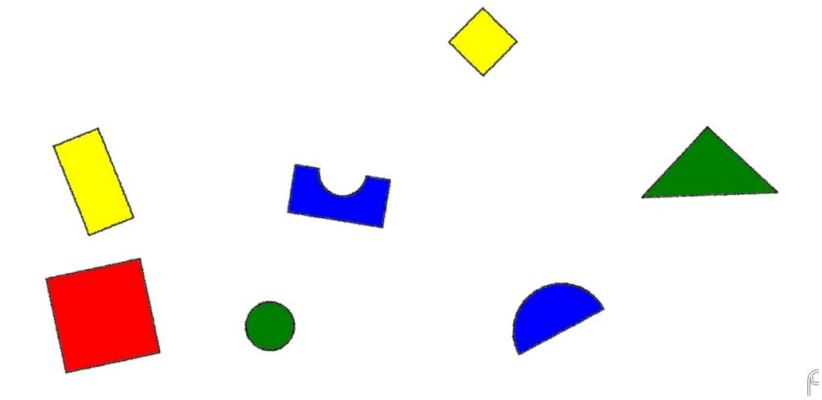
Alternate Trail Making

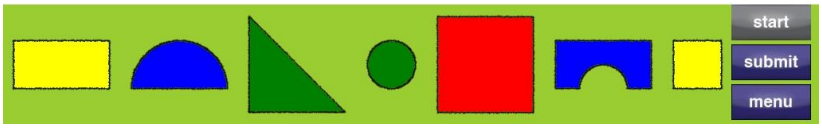
- Activity Options:
  - Circle à Triangle, 1 -> A -> 2 -> B -> 3 ->C…
  - # of sizes (for shapes)/# of alternates (for number ->letter) = (2-5 pairs)
  - Number of activity instances
- Information Recorded:
  - Time it takes to complete activity
  - Whether shapes or number/letter alternates
  - Is path correct?
  - Where wrong?
- To select:
  - Finger
  - Pen

9.2 Block Bash

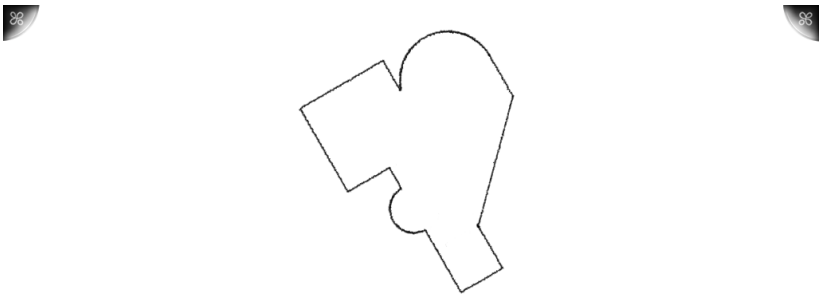


- Bottom row of shapes are placeholders for 3-D wooden blocks (each colored accordingly with tags for Microsoft Surface recognition)
- The following screens describe 3 different levels of this activity. Level will be provided based off of level selection by therapist in TheraLink (web application)

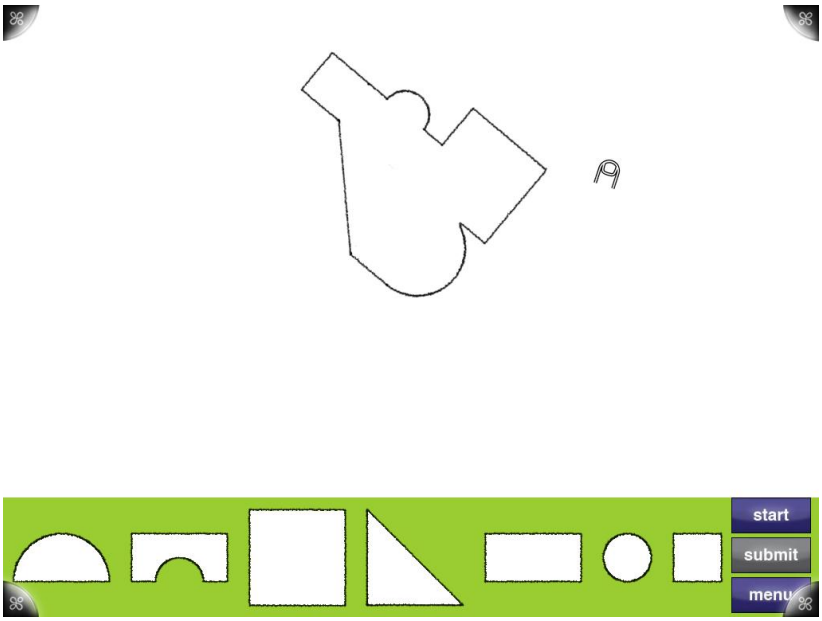




- Easy level – shapes appear on the screen in random location and orientation
- User must place block on top of matching shape (color and style)



- Medium Level – tangram appears on the screen; tangram is in color for matching
- User must place block on top of matching shape (color and style)

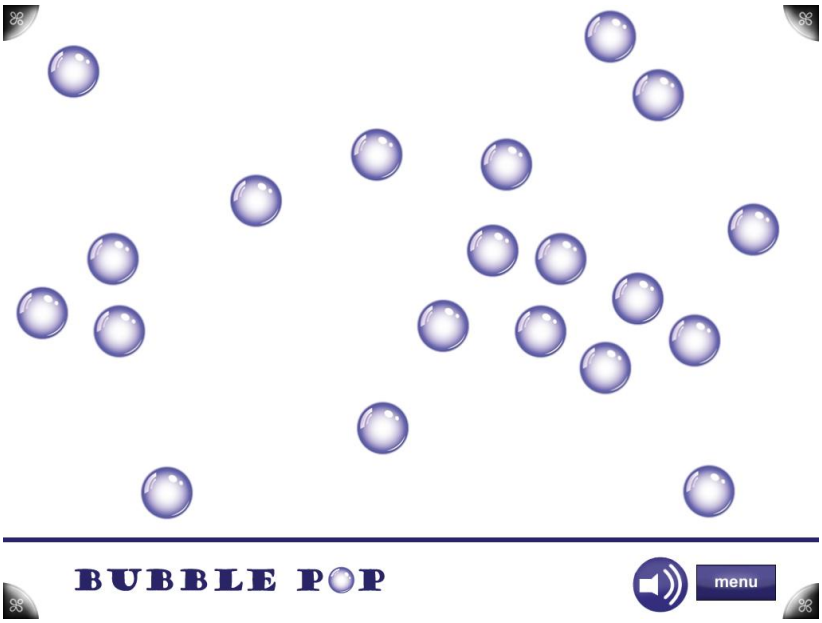


- Hard Level – tangram appears on the screen; color has been removed
- User must place blocks to create tangram on screen

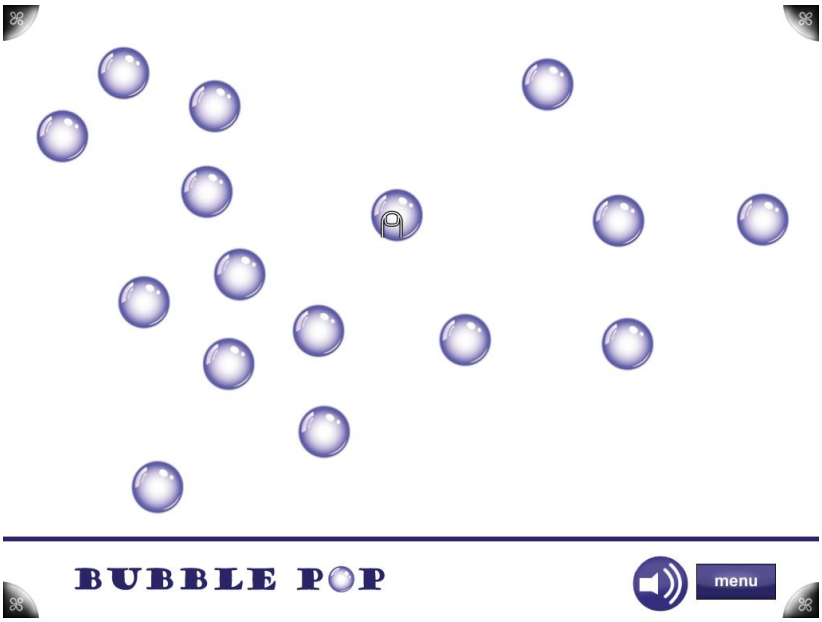
Block Bash

- Options
  - Three Levels
    - Easy (Random Shape Placement/Orientation)
    - Medium (Tangram with Color)
    - Hard (Tangram Monochromatic)
- Info Recorded
  - Time to Complete
  - Correct/Incorrect Block Placement
- To Register with Microsoft Surface
  - Using Block

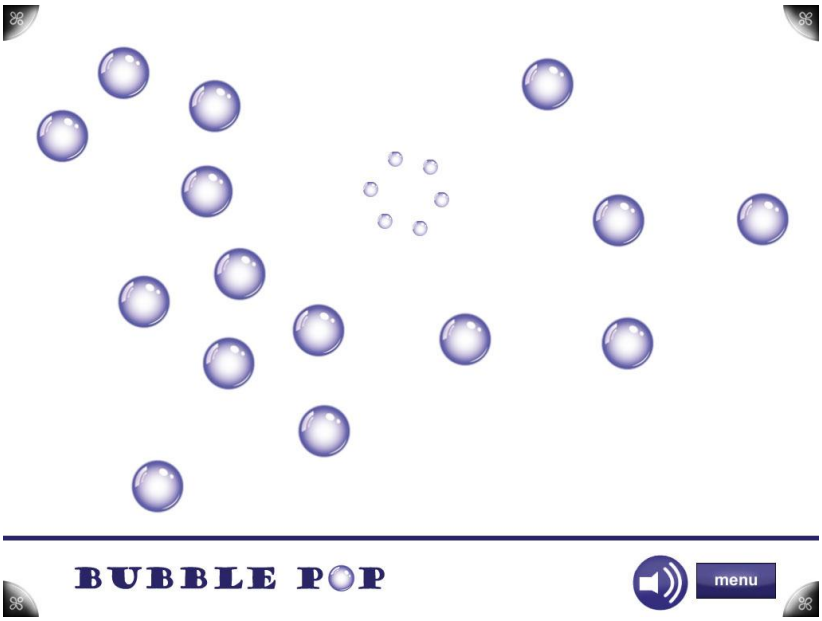
9.3 Bubble Pop



- Bubbles will enter screen from all sides, and will remain on screen until popped
- Bubbles will be constantly moving/bouncing against each other and edges of screen
- Number of bubbles displayed & size of the bubbles defined in level chosen by therapist in TheraLink (web application)



- User must “pop” bubbles by touching a bubble

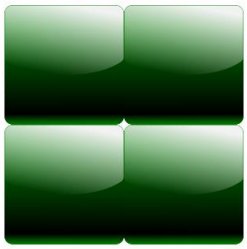


- Bubble will pop on contact
- Activity completes when all bubbles on screen have been popped

Bubble Pop

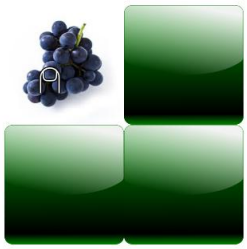
- Options
  - Number of bubbles displayed
  - Size of bubbles
- Info Recorded
  - Time it takes to complete activity
- To Pop Bubbles
  - Finger

9.4 Card Match



CardMatch menu

- # of cards specified in Staff Application
- User selects one card

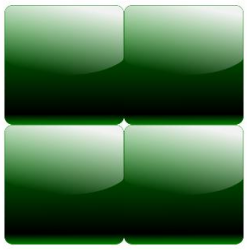


CardMatch menu

- Card image stays displayed while user selects another card

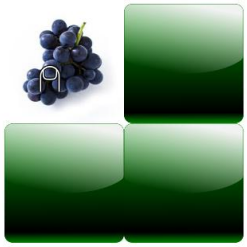
CardMatch menu

- Cards do not match



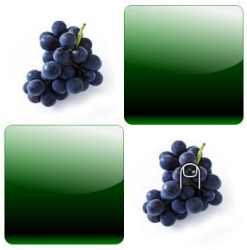
CardMatch menu

- User must try again
- User selects one card



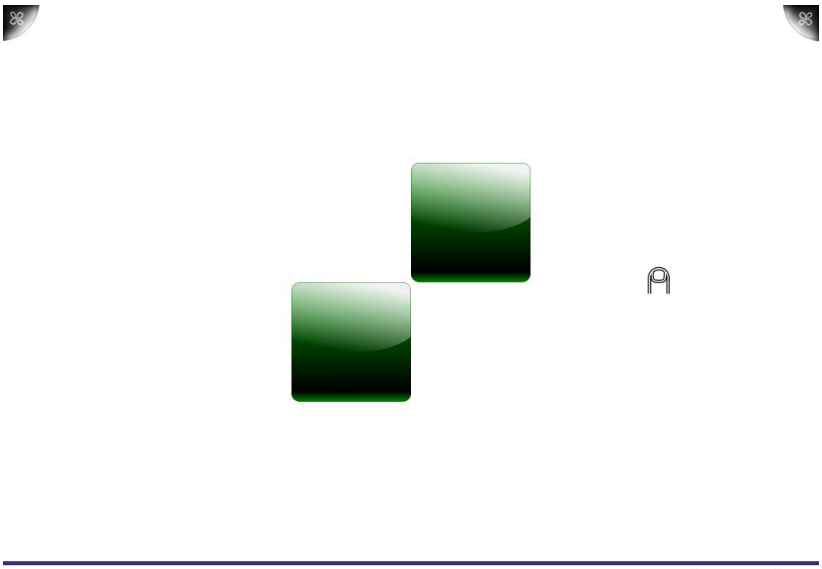
CardMatch menu

- Card image stays displayed while user selects another card



CardMatch menu

- Match Found!

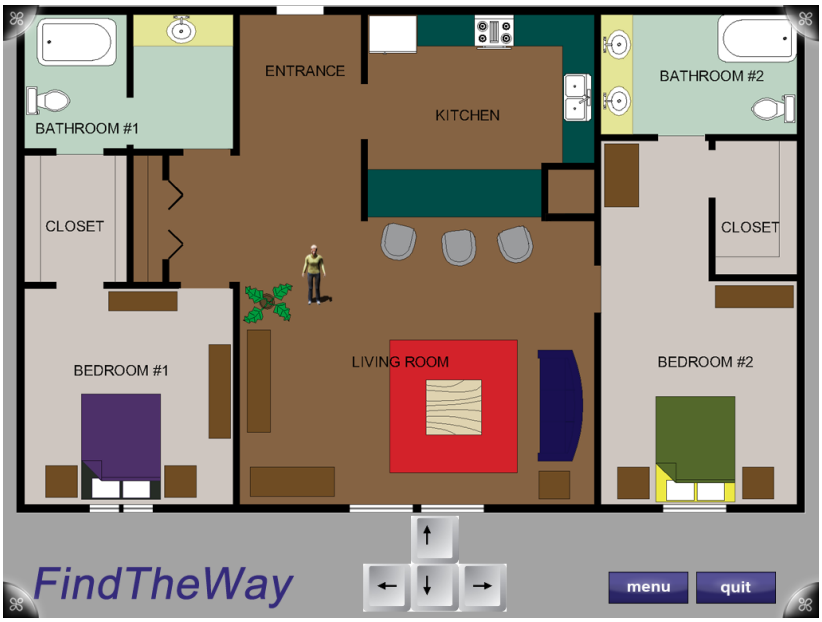


- Matching cards disappear
- User must select another card

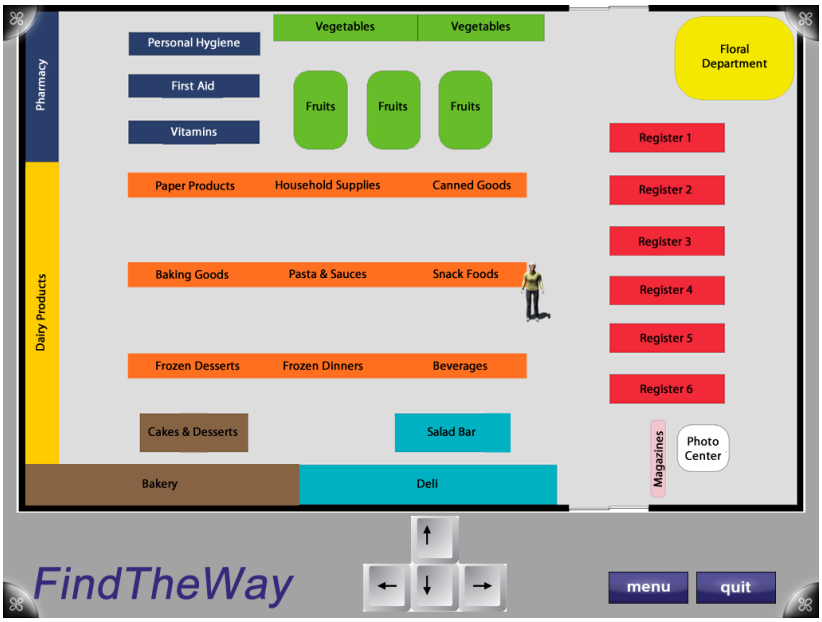
Card Match

- Activity Options
  - # of cards (no more than 10 pairs)
- Info Recorded
  - Time it takes to complete activity
  - Number of cards used
- To select cards
  - with finger
  - with pen

9.5 Find The Way



- User will be provided a floor plan determined by therapist in TheraLink (web application)
  - Two-Bedroom Home
  - Grocery Store
- Therapist (or User) will choose where to start the person by touching the screen in the desired location

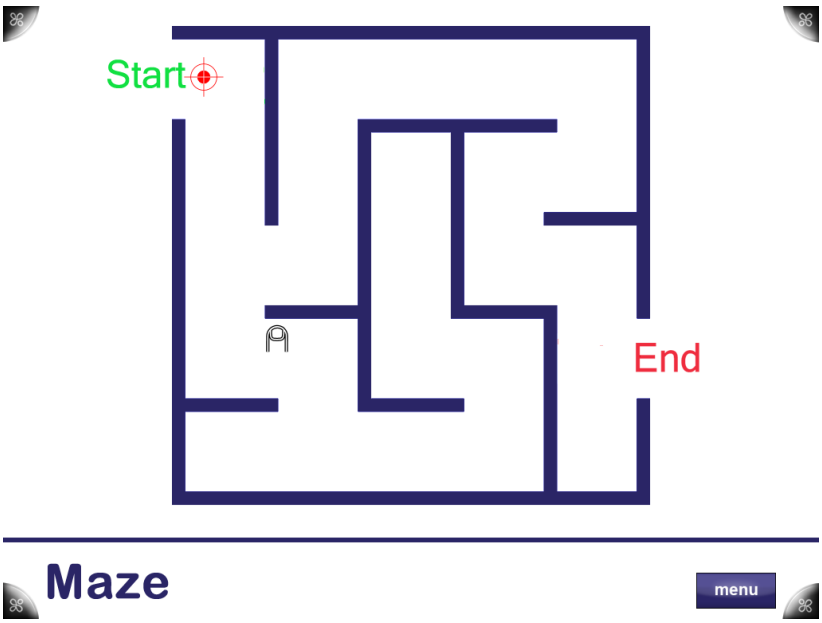


- User will be provided a floor plan determined by therapist in TheraLink (web application)
  - Two-Bedroom Home
  - Grocery Store
- Therapist (or User) will choose where to start the person by touching the screen in the desired location

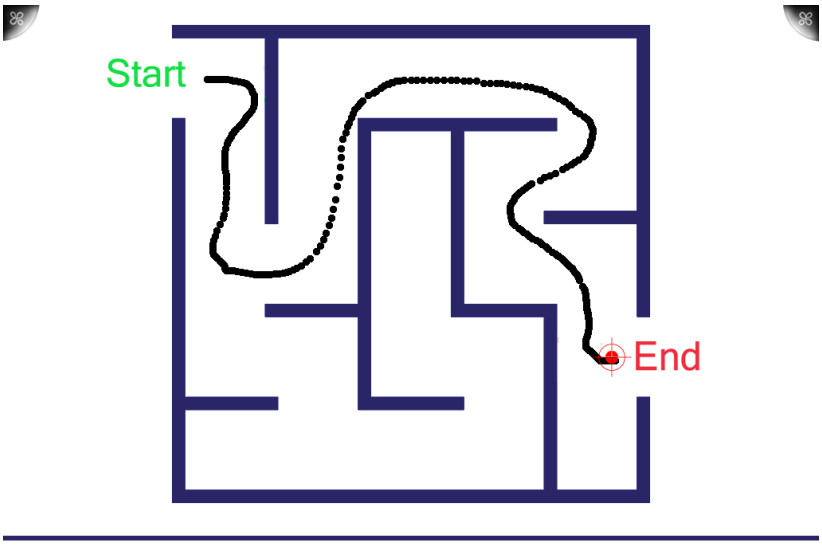
Finding the Way

- Options
  - Various Floor Plans
    - Two Bedroom House
    - Grocery Store
- Info Recorded
  - None – an interactive tool for therapist only
- To Place Person
  - with finger touch
- To Move Person
  - with arrows

9.6 Maze



- Maze will appear on the screen (difficulty pre-defined)
- User must start dragging finger at “start” and solve maze by getting to the “finish”



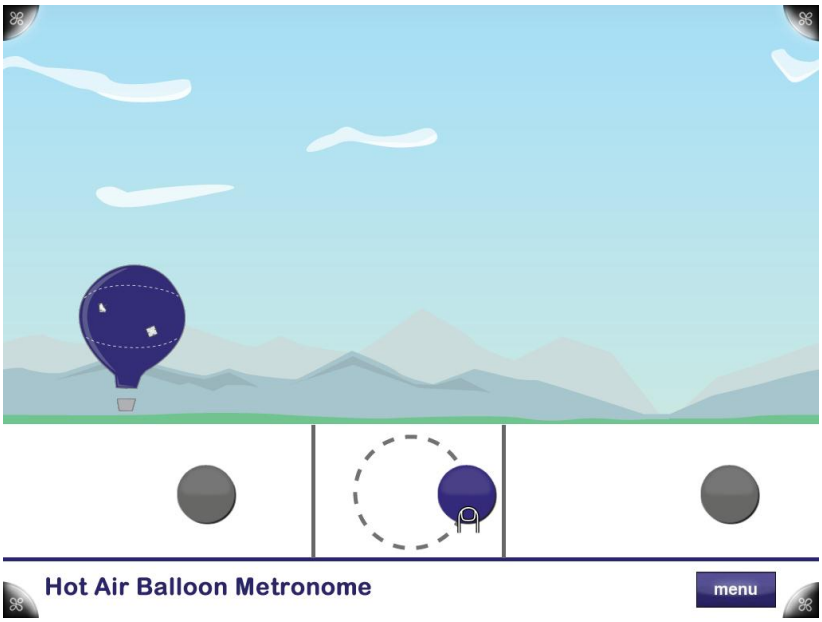
- User shall try to not hit any walls when drawing path
- Activity is complete when user reaches “Finish”

Maze

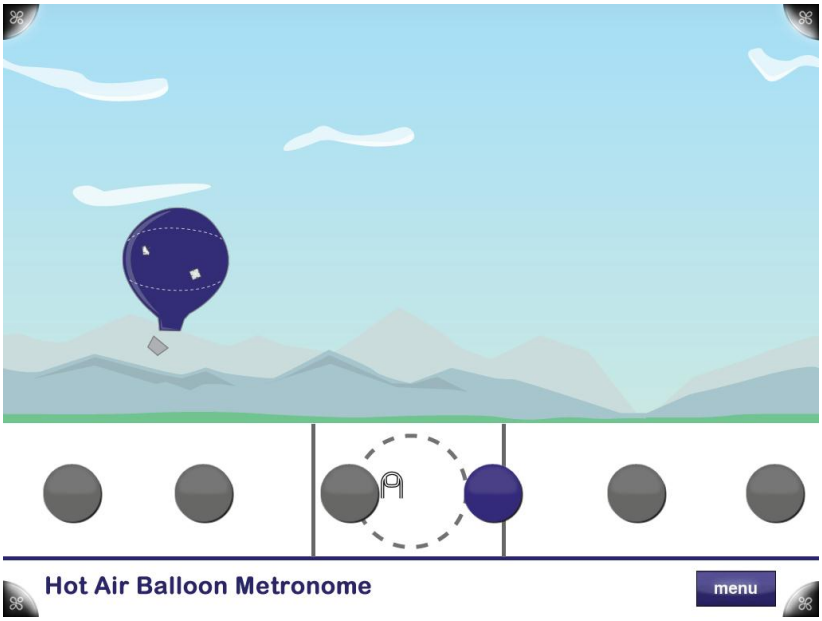
- Options
  - Difficulty (Easy, Medium, Hard)
  - Each level contains 5 mazes which are randomly chosen to be displayed & randomly oriented when displayed
- Information Recorded
  - Time to Complete
  - Wall Hits
- To Register with Microsoft Surface
  - Finger

.

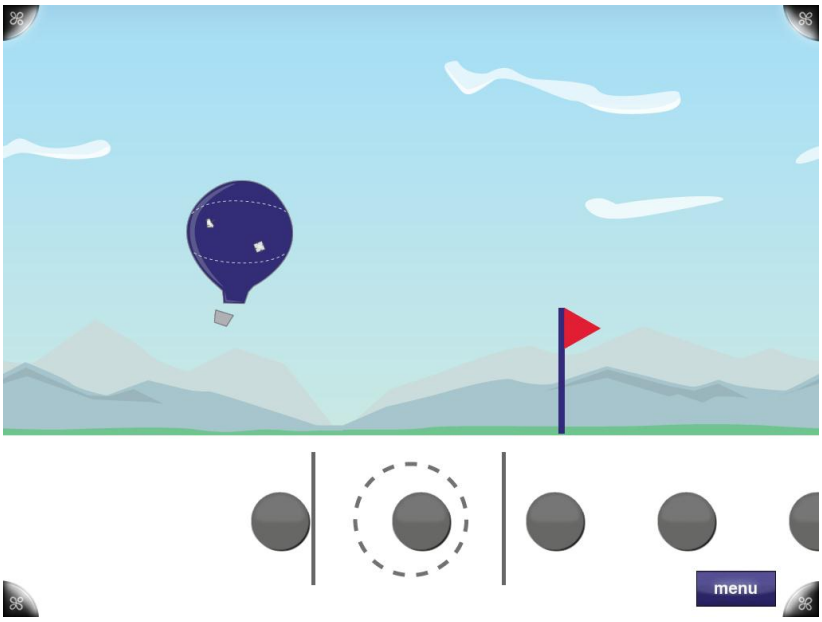
9.7 Metronome



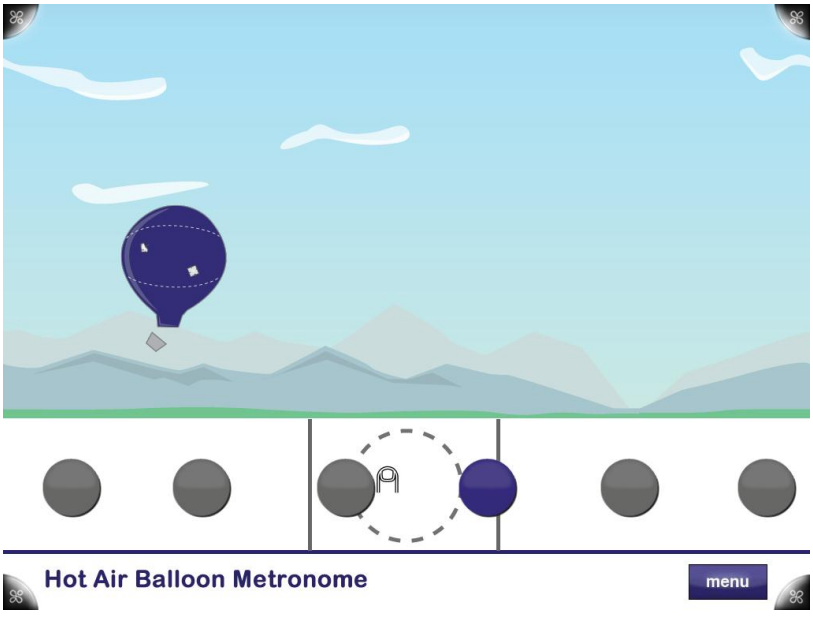
- The goal is to tap on the circles when they move within “Target Zone” the dashed circle in the middle of the bar



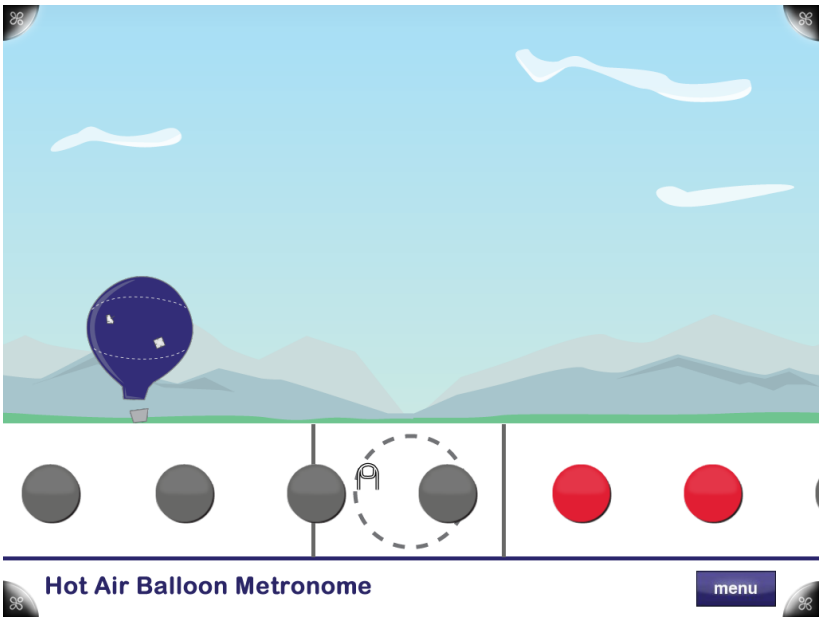
- When the user taps/presses the “Target Zone” in-sync with the pace/”circles” the hot air balloon takes off/increases in elevation



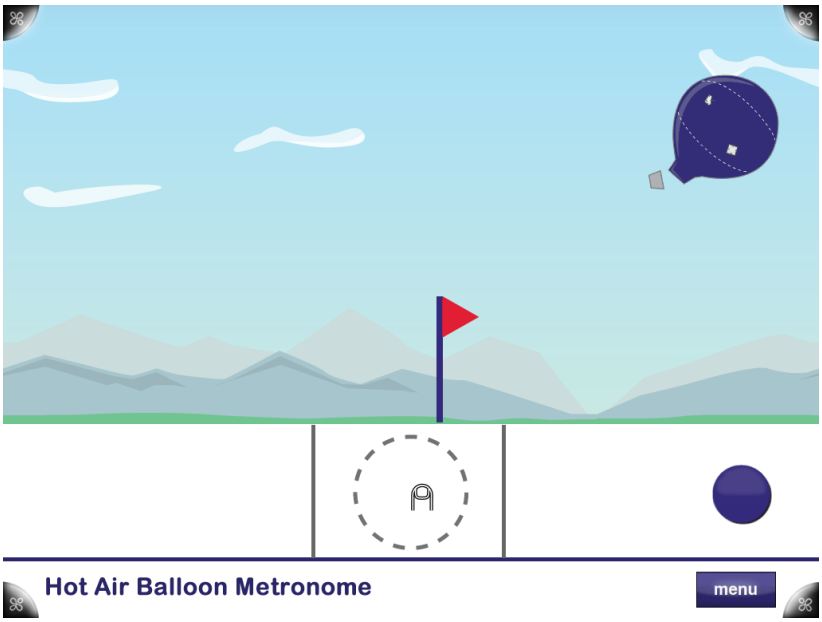
- This is an Interactive Metronome activity, it is made up of a mini video game (top window) that reflects the user's input and the metronome bar (bottom)
- When the activity starts, the pace of the metronome is represented by circles which move across the bar



- When the user misses the pace or presses the "Target Zone" too early, the hot air balloon decreases in elevation or lands on the ground if low enough.



- Metronome pace, length of activity, and other options can be defined in the activity options using TheraLink

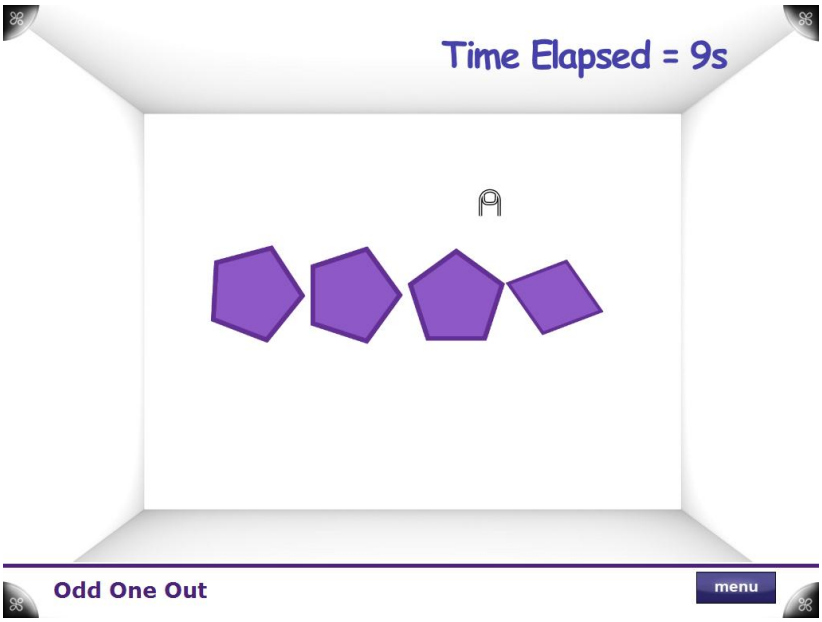


- The activity ends when the time (duration) option that was selected is reached

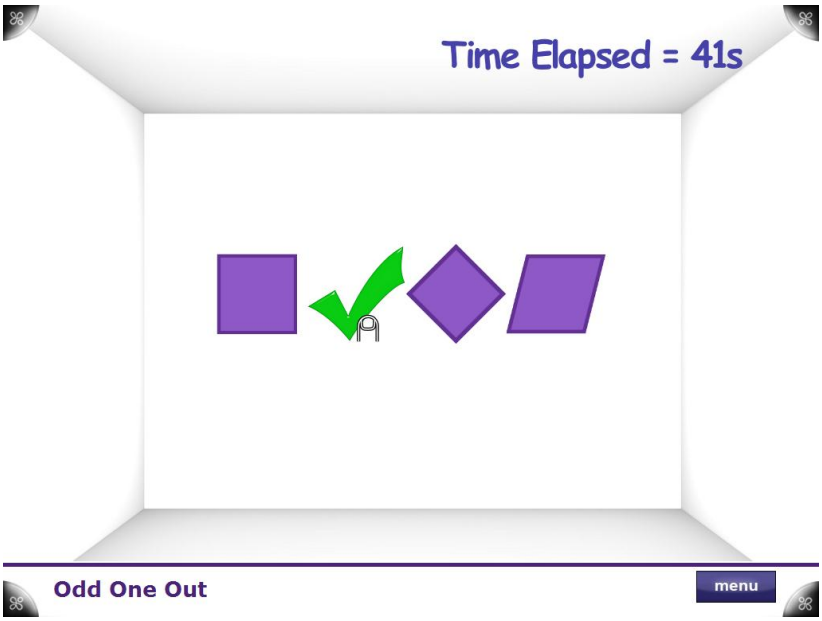
Metronome

- Activity Options:
  - Metronome pace
  - Length of activity (duration)
- Information Recorded:
  - Number of missed beats
  - Total number of beats
- To Press the “Target Zone”:
  - Finger

9.8 Odd One Out



- 4 shapes or pictures will appear
- User will decide which image does not belong based on the given set of images
- The user will then touch with their finger which item does not belong in the set displayed.

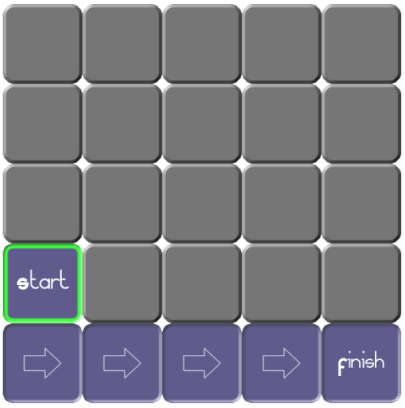


- Correct answer will be displayed
- The next set of random images will be displayed
- The user will then touch with their finger which item does not belong in the set displayed.

Odd One Out

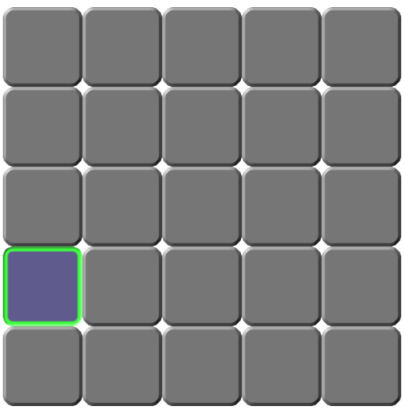
- Activity Options
  - Shapes, Pictures (real-life images or line drawings)
  - Categories (if picture option chosen - fruits, cars, animals ,etc.)
  - Number of shapes/pictures (3-8)
  - Number of activity instances
- Info Recorded
  - Number of shapes/pictures used per question (3-8)
  - Accuracy (correct/incorrect)
  - Categories used
  - Length of time taken for a guess
- To select correct image
  - with finger
  - with pen

9.9 Path Track



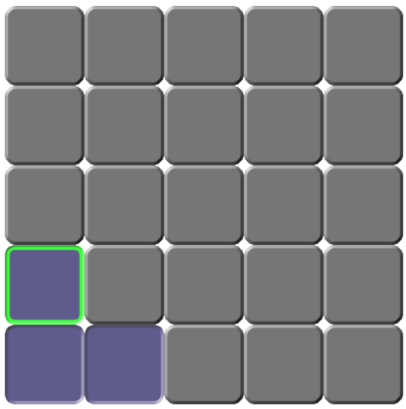
PathTrack continue menu

- Hand is animated moving from tile to tile through the matrix, to indicate the direction of path
- Path is outlined in a color or a visual marker to indicate where the path that was made
- Button press to clear matrix for user to enter path



PathTrack submit menu

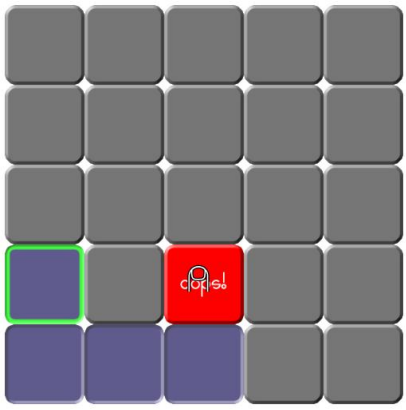
- Data collection starts
- User starts to retrace path from start to finish with finger



PathTrack submit menu

- User can draw paths either by having constant contact (finger to matrix) or individually pressing each tile in the correct order from start to finish
- User's path will be outlined in a color or a visual marker as user draws path
- User's last correct tile is colored darker or marked differently to signify where to continue from

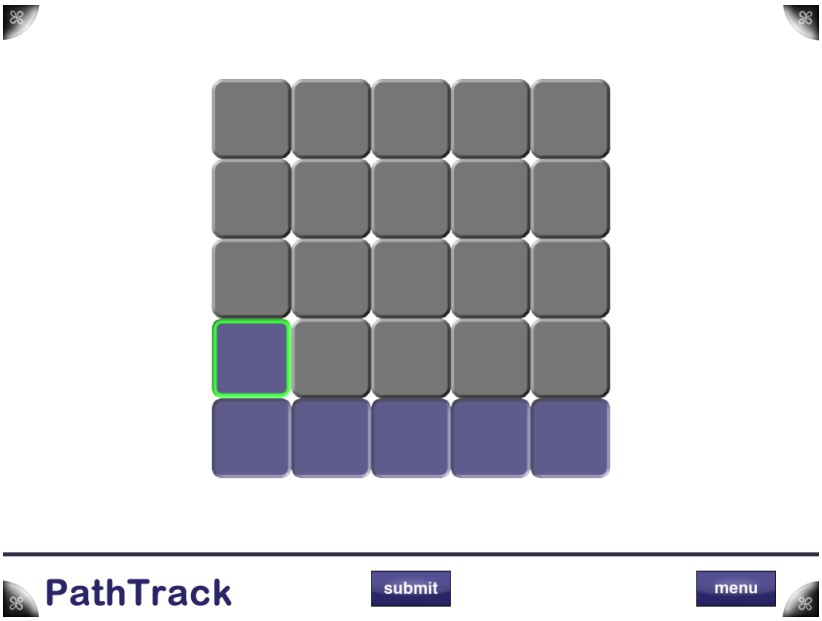
**Path & Drawing Options can be customized*



PathTrack submit menu

- If user selects or draws to a tile not in path or is in path, but not in correct sequence, the selected tile will be colored or marked in a way to indicate not in path or incorrect order
- Incorrect tiles will fade back to a unselected default tile

**Options for Error Handling can be configured differently to get desired results (example: Turn off error indicators, so user's path is not skewed by errors)*

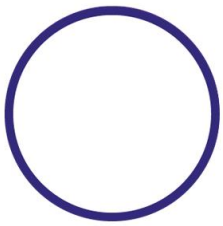


- User presses the "Finish" button to indicate path is redrawn and to stop activity/data collection
- If specified in options, Path Recall will restart with the next set of options and path pattern

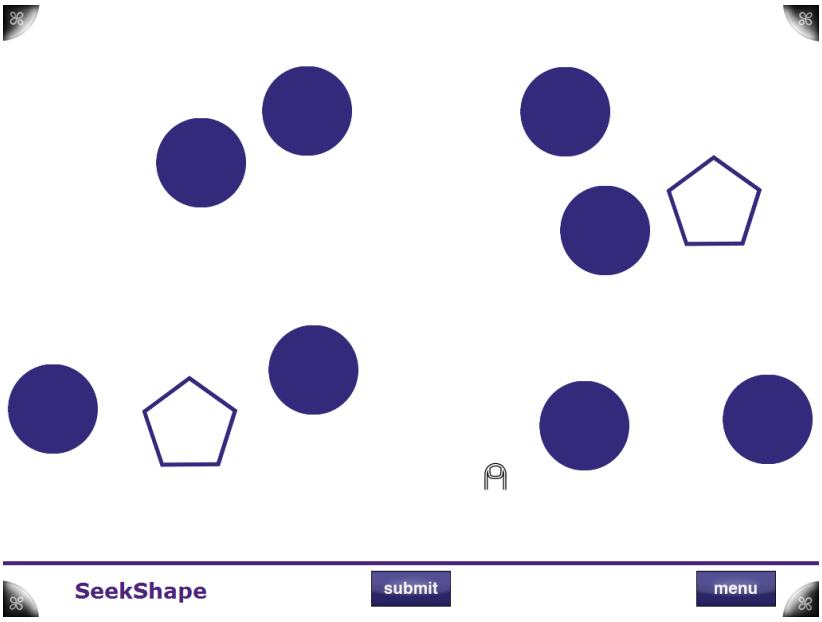
Path Track

- Activity Options:
  - Size of Matrix (# of squares on screen) = (3X3 - 6X6)
  - Path pattern (easy, medium, difficult)
  - Enable/disable error indicators
  - Number of activity instances
- Information Recorded:
  - Time it takes to complete activity
  - Size of matrix
  - Path difficulty
  - Number of selected incorrect tiles not in path
  - Number of select incorrect tiles not in correct order
- To select/draw path:
  - Finger
  - Physical object

9.10 Seek the Shape



- Shape fades in
- Stays on screen for 5 seconds
- Shape fades out

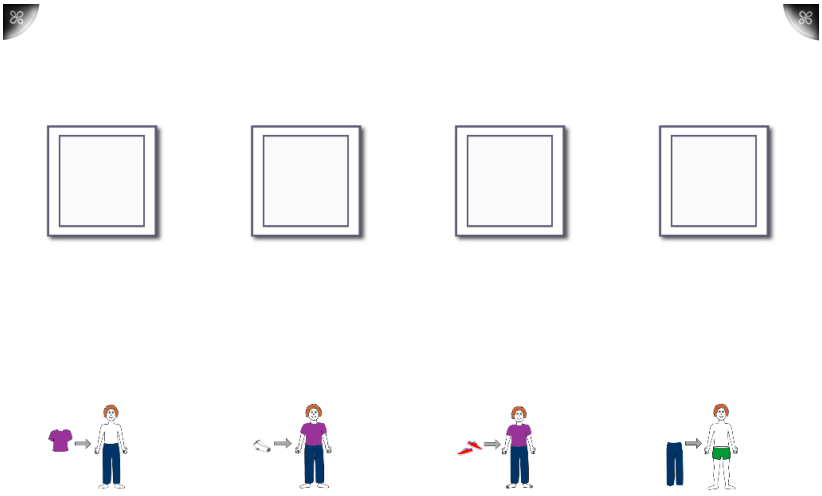


- User must select all instances of the shape appearing on the previous slide
- Once selected, shape changes colors

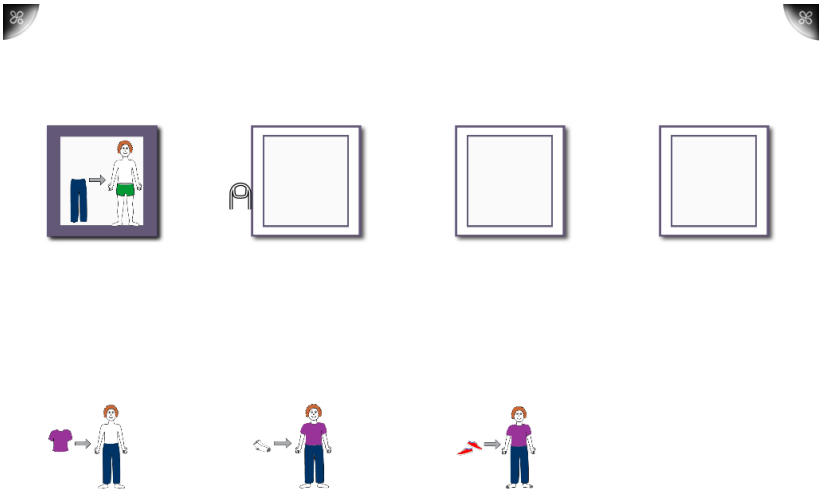
Seek the Shape

- Activity Shape Options
  - Numbers
  - Letters (uppercase & lowercase)
  - Other Symbols/Shapes/Pictures
- Activity Options – when shape selected
  - strike through
  - changes to a different color (MOST IMPORTANT)
- Activity Options - shapes
  - levels (1=very different shapes à x=very similar shapes)
  - # of unique shapes (2-5)
  - # of shapes on screen (20-50)
  - shapes will then be displayed evenly over 4 quadrants with at least one of the “seek shape” in each quadrant
- Info Recorded
  - Time it takes to find all instances of the shape
  - Accuracy
- To select Shape
  - with finger
  - with pen

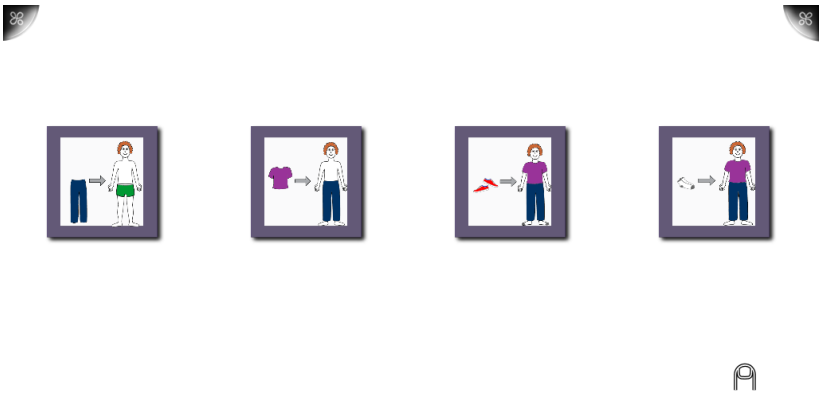
9.11 Sequence



- User must place pictures in logical order by sliding them to their proper place



- Once an item is placed in the correct order it will lock into place

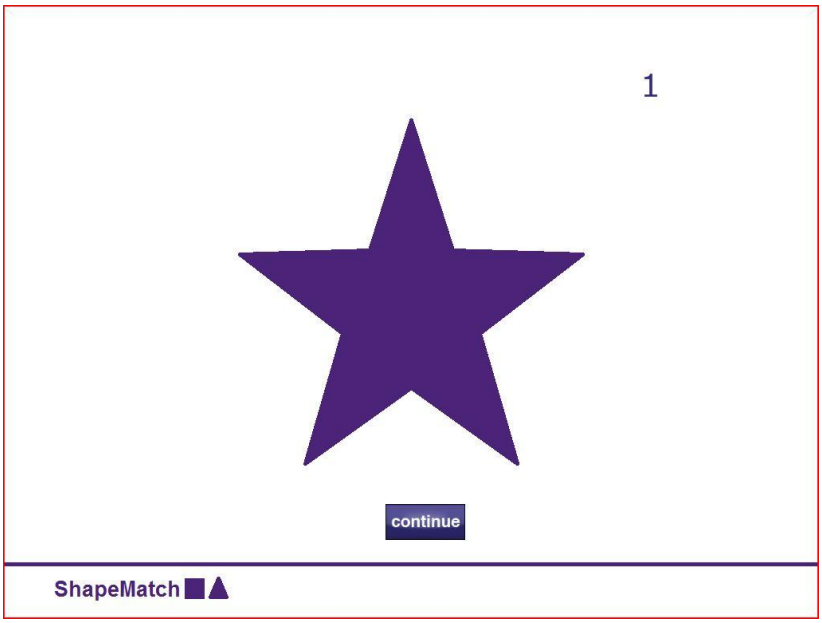


- Once the user is satisfied with the order they have created, they must select the “submit” button
- If the order is incorrect, the user will be told to try again (if the option is selected, the pictures in the correct spots will have a drop shadow showing the user which pictures to then rearrange and re-submit)

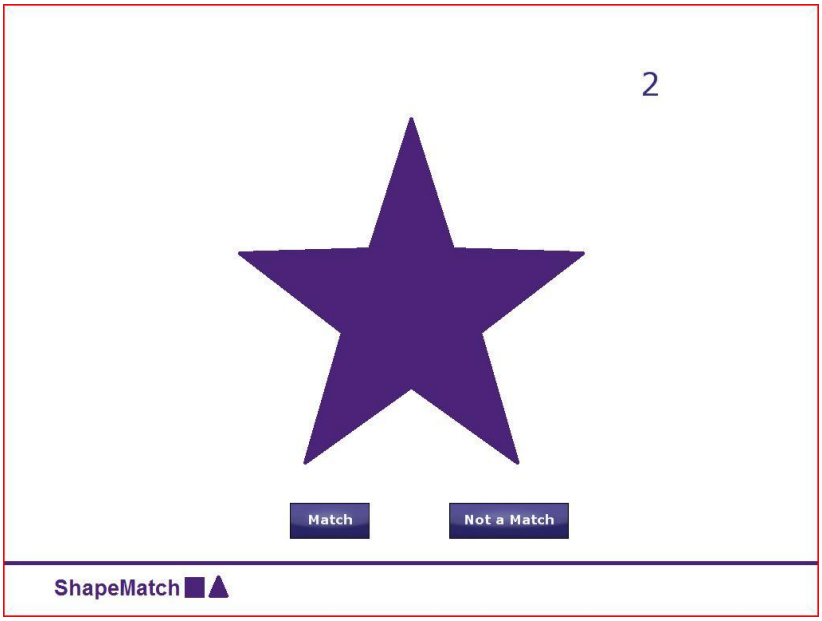
Sequence

- Activity Options
  - Words/Only Pictures
  - Type of Sequence (Brush Teeth, Put on Clothes, Mail Letter, Make Spaghetti)
  - Apply drop shadow on correct (after submit)
- Info Recorded
  - Time it takes to complete activity
  - Number of incorrect placements
- To move pictures
  - with hand

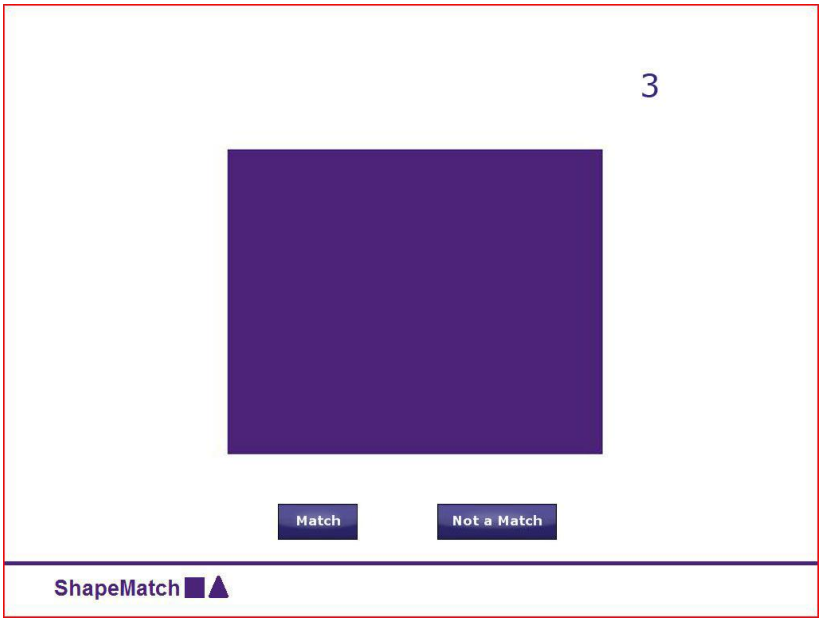
9.12 Shape Match



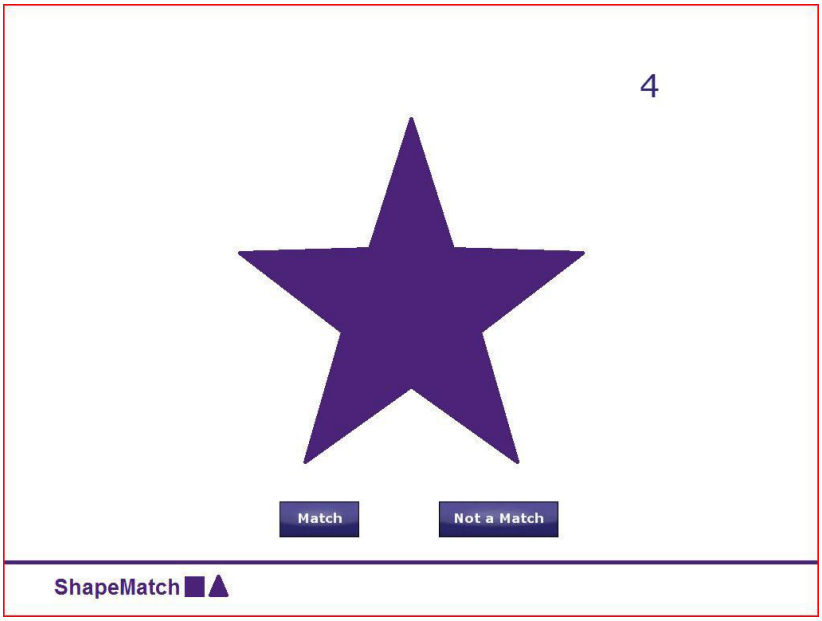
- First shape appears
- After the “continue” button is pressed to begin data collection



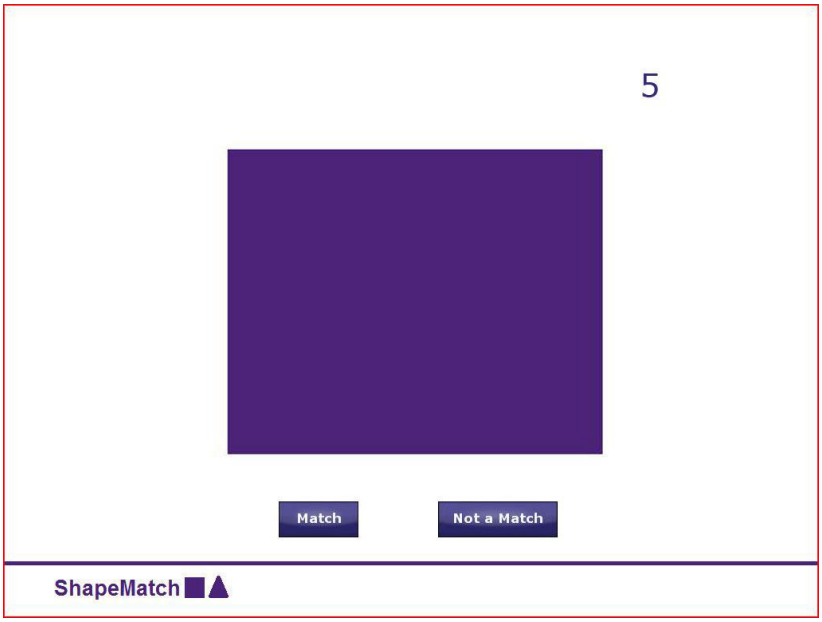
- Next shape appears
- User must select if the previous shape matches the current shape
- User will use the “YES” or “NO” button



- Next shape appears
- User must select if the previous shape matches the current shape
- User will use the “YES” or “NO” button



- Next shape appears
- User must select if the previous shape matches the current shape
- User will use the “YES” or “NO” button



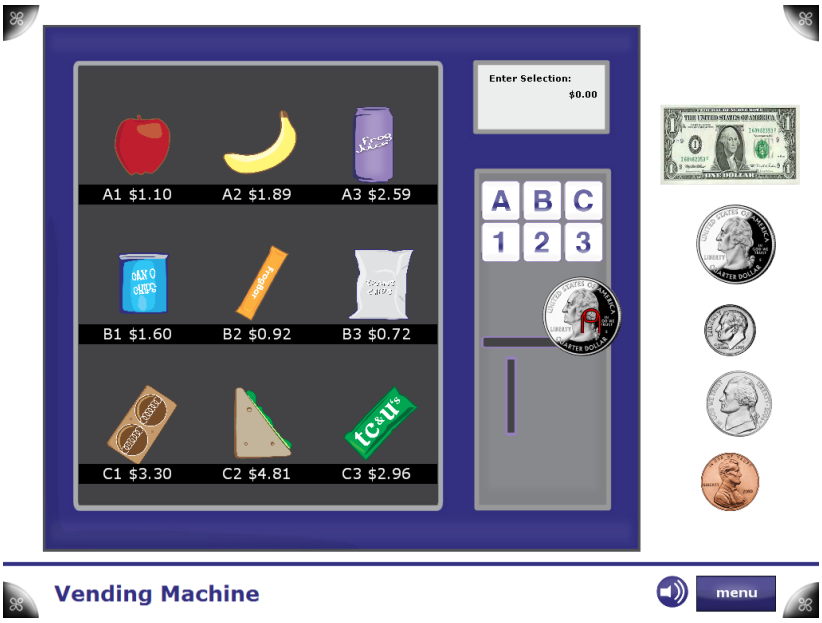
- Next shape appears
- User must select if the previous shape matches the current shape
- User will use the “YES” or “NO” button

Shape Match

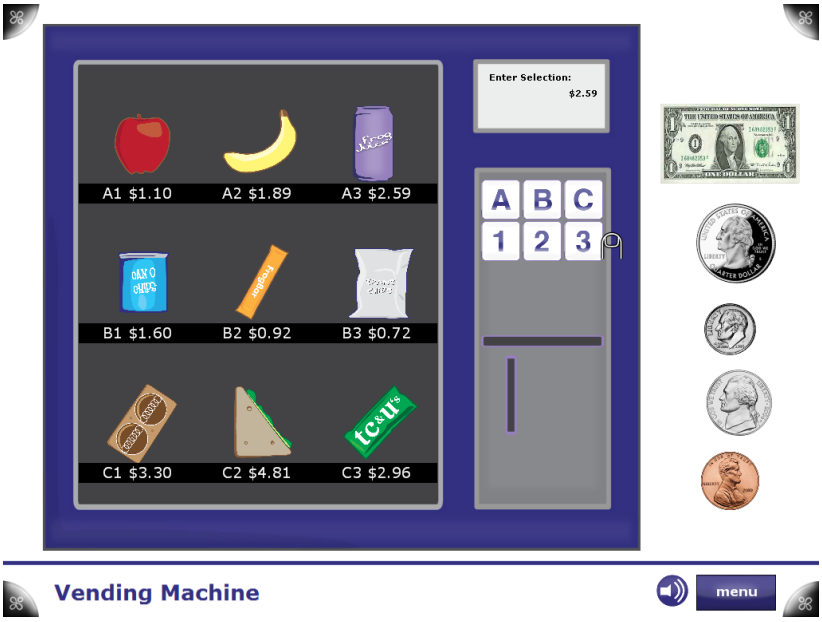
- Activity Options:
  - Shapes, Numbers, Letters, Pictures (line drawing or photograph) (only 2 unique)
  - # of shapes in the set (5, 10, 15, 20)
  - Number of activity instances

- Information Recorded:
  - Time it takes to complete activity
  - # of correct/incorrect answers
  - Whether shapes, numbers, letters, or pictures
  - # of shapes in the set

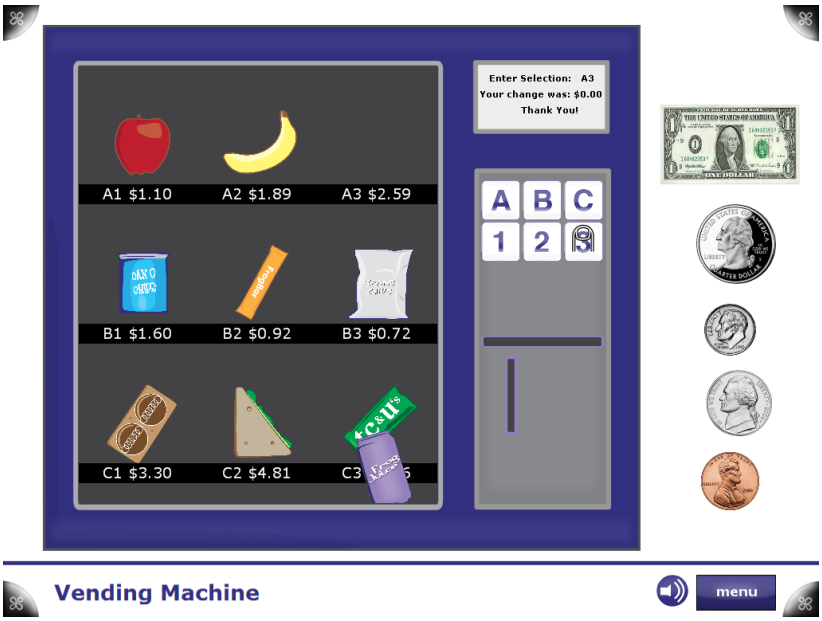
9.13 Vending Machine



- User will choose which item they wish to purchase
- User will drag money from tray to coin/dollar slot(s)



- Once money has been entered (user determines how much), they must then enter the letter-number associated with the item they wish to purchase



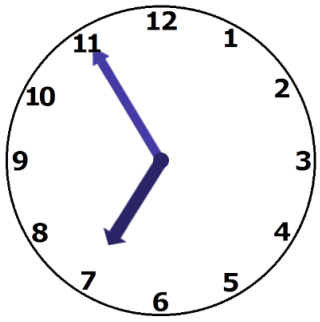
- If correct amount entered, item selected will “spin and drop” as if purchased
- If incorrect amount entered, display will show an error and count as incorrect

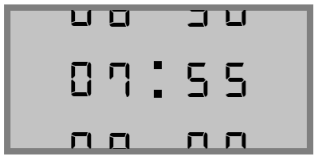
Vending Machine

- Activity Options

- Info Recorded
  - Time it takes to complete activity
  - Number of incorrect
- To select Shape
  - using sponge (something to grasp)
  - with hand

9.14 What Time is it

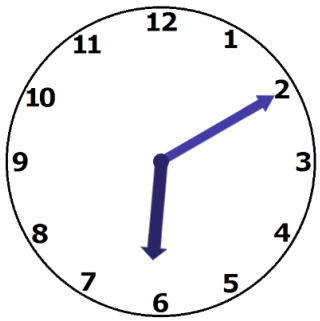


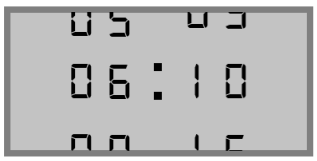


submit

What Time Is It? menu

- Digital clock wheels are locked
- User must drag hands of analog clock to match digital time
- Press “Submit” button to check for accuracy
  - If wrong, try again!
- Repeat for # of times specified by therapist in Web App





submit

What Time Is It? menu

- Analog clock hands are locked
- User must spin digital clock wheels to display time on analog clock within red area
- Press “Submit” button to check for accuracy
  - If wrong, try again!
- Repeat for # of times specified by therapist in Web App

What Time is it?

- Options
  - digital - analog
  - analog - digital
- Info Recorded
  - Time it takes to complete activity
  - Is time correct? - Accuracy
  - Analog # correct/incorrect
  - Digital # correct/incorrect
- To move arrows/wheels
  - with finger

9.15 Wipe the Table

- Splat fades in with # (not necessarily in correct order)
- Stays on screen until user “wipes” (user must determine if number on screen is numerically next)
- Splat fades if user “wipes” off

Wipe The Table

menu

- Splat fades in with #
- Stays on screen until user “wipes”
- Splat fades if user “wipes” off

Wipe The Table

menu

- Splat fades in with # (4 does not come after 2)
- Stays on screen for ?? seconds or until user “wipes” (if they wipe, gets marked incorrect)

Wipe The Table

menu

- Splat fades in with #
- Stays on screen until user “wipes”
- Splat fades if user “wipes” off

Wipe the Table

- Activity Options
  - Ordered/Unordered sequence of blobs
  - Tap/Wipe blobs away
  - Black & White or Colored blobs
  - Total number of blobs
  - Wait Time between different blobs
  - Fade time before blob disappears without user input
- Info Recorded
  - Time it takes to complete activity (1-10, etc.)
  - Accuracy
- To select Shape
  - with finger
  - using sponge (Any tagged object)