# Sarah Williams Project Proposal

Statement of purpose

* Title
  + Witty Mathmagician
* Purpose
  + To make early math a little bit easier for young children
    - Addition
    - Subtraction
    - Shapes

Runtime environment

* Desktop and mobile

Information needed

* Username
* Password
* Phone number to reset password

Data to be persisted (data base)

* Username
* Achievements

App concerns

* Inability to reset username/password

User interface outline and functional flow

C:\Users\swill\OneDrive\MSSA\Capstone Project\Project Outline\

Special features

* Achievement tracking
* Quizzes/Practice
* Scratch pad
* Animations

# Classes, Methods, and Databases

### Random Math Joke Class

* Pulls a random math joke from the math joke database and shows it on the main menu

### Calculator Class

* Basic calculator that will use addition and subtraction ONLY.

### User Class

* Username
* Password

## Shape Interface

### Triangle Class

### Rectangle Class

### Square Class (Inherit from Rectangle class?)

### Pentagon Class

### Hexagon Class

### Octagon Class

### Number Line Class

* + Missing number addition method
    - Takes out the next number in the number line

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | ? | 10 |

* + Missing number subtraction method
    - Takes out the previous number in the number line

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 10 | 9 | 8 | 7 | ? | 5 | 4 | 3 | 2 | 1 |

### Shape Pattern Class

* Starts a pattern with the shapes and has the user click on what shape would come next
  + Square, circle, triangle, square, circle, triangle, square, circle, ???

## Math Joke Database

* Contains a list of math jokes

### Achievement Database

* Contains a list of all possible achievements—names of achievement and conditions
* Link achievements to the User
  + If achievement condition is met, then greyed ribbon turns gold
  + Information persists so the user doesn’t lose progress/ribbons
  + If user is not logged in, achievements will not be earned.

### Achievement Class

* Verifies the conditions for the achievements
* Ribbon Color method
  + Changes the ribbon color of the corresponding achievement if condition is true.

### Practice Addition Class

* Generates random addition problems whose sum is less than or equal to 29
* If user’s answer is correct the question number will turn green.
* If user’s answer is incorrect the question number will turn red.
* Unanswered questions will remain white.

### Practice Subtraction Class

* Generates random subtraction problems with numbers between 1 and 29, whose difference is greater than or equal to 0.
* If user’s answer is correct the question number will turn green.
* If user’s answer is incorrect the question number will turn red.
* Unanswered questions will remain white.

### Practice Shapes Class

* Generates random shapes from the shape interface and requires the user to select the correct name for that shape.
* Shapes will vary in size.
  + “Which shape is a rectangle?” user clicks on the correctly displayed shape.
* If user’s answer is correct the question number will turn green.
* If user’s answer is incorrect the question number will turn red.
* Unanswered questions will remain white.

### Scratch Pad Class or capability of some sort

* Drawing pencil
* Eraser
* Only appear on addition and subtraction practices

## The Achievement Database

|  |  |
| --- | --- |
| ID | Achievement |
| 1 | Create a user account |
| 2 | Complete the addition learning path |
| 3 | Complete the subtraction learning path |
| 4 | Complete the shapes learning path |
| 5 | Complete the square learning path |
| 6 | Complete the rectangle learning path |
| 7 | Complete the triangle learning path |
| 8 | Complete the circle learning path |
| 9 | Complete the pentagon learning path |
| 10 | Complete the hexagon learning path |
| 11 | Complete the octagon learning path |
| 12 | Complete all the learning paths |
| 13 | Complete the addition practice with at least 15 questions correct |
| 14 | Complete the addition practice with all 20 questions correct |
| 15 | Complete the addition practice in less than 15 minutes |
| 16 | Complete the subtraction practice with at least 15 questions correct |
| 17 | Complete the subtraction practice with all 20 questions correct |
| 18 | Complete the subtraction practice in less than 20 minutes |
| 19 | Complete the shapes practice with all 20 questions correct |
| 20 | Complete the random practice with all questions correct |
|  |  |

### Math Joke Database

|  |  |
| --- | --- |
| ID | Joke |
| 1 | Why was the math book sad? Because it had too many problems! |
| 2 | Why was the equal sign humble? Because it new it wasn’t less than or greater than anyone else! |
| 3 | Why do plants hate math so much? Because it gives them square roots! |
| 4 | Why was 6 afraid of 7? Because 7, 8, 9! |