**Math Calculator App**

CMPS 480: C# Distributed Internet Computing

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**Content**

Abstract……………………………………………………………………………………………2

Introduction.……………………………………………………………………………………….2

Core Features……………………………………………………………………………………...3

Planning…………………………………………………………………………………………...4

Tool Used………………………………………………………………………………………….6

Implementation……………………………………………………………………………………6

Evaluation…………………………………………………………………………………………6

Future Expansion……………………………………………………………………………… 13

**Abstract**

The application we have created will use math formulas to help math students solve their math problems. As a student, it is important to check on your answers before you turn in your assignments because your answers can be incorrect. A math calculator will be able to help with that. The name of the application is Math Calculator App. This application will allow the user to choose form five different calculators to help them solve their math problems or study for their math exams. The purpose of this application is to help math students check their answers with a quick and easy to use forms and calculators. So far, the application has 5 core features. These features are default calculator use to compute simple math expressions, find the slope calculator to find the slope of two points, finding the area and perimeter of a multiple shapes, a midpoint calculator to find the midpoint of two points, and random integer generator to produce random integers.

**Introduction**

Our intended audience are students and anybody who are interested in using a math calculator to solve math problems. A scenario that our application can be very useful for math students are when students are checking their answers or are having a hard time solving an issue like finding the area of a circle. For students, having a calculator to help them check the answers can help them the grade they need to pass their classes and study for their exams. A good thing about the current way that student’s study is that they can focus on formulas they need to know. However, the bad thing about the current way students’ study is that they mix up their formulas and get the wrong answers. Some students can find it difficult to memorize all the equations they need to solve their math problems. Our project is going to change the way students can study and solve problems in a great way by giving them an easier way to check on their answers and solve their math problems.

**Core Features**

This application has five major core features. The first major feature is the default calculator. The default calculator can preform subtraction, addition, division, multiplication with two numbers. The respond we be shown in the calculator’s display. The second major feature is the find the slope calculator. The user will be able to enter two points and the app will calculate the rise, run, and slope using the two points the user has entered. In the future, we would like to enter a graph the user will be able to plot their points and see a visual representation of their graphing points.

The next major feature is finding the area and perimeter of shapes. The application will give the user four options to choose from: a circle, a rectangle, a square, and a triangle. The user will need to fill out the necessary fields and submit the inputs for the app to compute the area and perimeter of the shape they have chosen. The fourth major feature is the Midpoint calculator. The user will have to enter two points and submit the inputs for the calculator to compute the midpoint for the user. This calculator can be useful for students to compare their midpoint that they have come up with on their own and check both answers. The next and final major feature is the random integer generator. This section of the app uses an API to compute a number between 1 and 100 inclusively. The numbers are produced randomly, and the user will be able to produce random number if they need to for an assignment. In the future will like for the user to enter the range for the integers and the number of integers the user would like to generate.

**Planning**

Overall, we mostly worked together on this project. Antonio was responsible for creating the area and perimeter, midpoint, and random integer. Julian was responsible for completing the default calculator and find the slope section for the GUI application. Together we worked on creating the files for each section of the app we were task to do. It took us about 2 days to plan and start everything. It took about 6-8 hours to complete the files for the application and another 2-3 hours of testing and commenting on the program. Also took about a day to complete the flowchart and to bring the app together. Overall, it took about a month to get everything done and set.

Estimated timeline for each task and assigned person for it:

* Planning and starting the project took about 2 days. Assigned to Antonio and Julian.
* Creating the area and perimeter, midpoint, and random integer was assigned to Antonio. Took about 2 weeks to implement and complete.
* Creating the default calculator and find the slope section was assigned to Julian and took about 2 weeks to implement and complete.
* Testing and commenting program took about 2-3 hours to complete. Assigned to Antonio and Julian.
* Flowchart took about a day to complete. Assigned to Antonio.
* Both Progress reports took about couple of days to complete. Assigned to Antonio.

App Flowchart:Diagram

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**Tools Used**

We used Visual Studio to create, develop, and implement our Math Calculator application. The Math Calculator application is a GUI application. The project can be hosted or run on any computer. Users will need to have the files downloaded on their computer. The program will then be able to be run on Visual Studios. Other tools like Google Drive and Word Document were used to create progress reports and presentations.

**Implementation**

The implementation process of the whole project was overall smooth and successful. We were able to create a complete program that met the requirements listed on the final proposal document by the deadline. The application was developed on Visual Studios and using C# and is a GUI application. The only two problems we ran into were finding a way to put our code into a single project file. We solved this issue by sharing files on GitHub and implementing the code in our project to make it work together. The next and final issue was finding a way to implement an API into our app. We fixed this issue by adding an API that generates random integers. Once again, the implementation of this project was successful.

**Evaluation**

When testing and evaluating our project, we checked and evaluated each major core feature one by one. The first major feature checked and evaluated was the default calculator. We checked that all numbers, operators, and results worked and were correct. The second major feature checked and evaluated was finding the slope. The third major feature checked and evaluated was area and perimeter and all the shapes that are available to the user. The next major feature checked and evaluated was midpoint and making sure inputs and results were correct. The last and fifth major feature that was checked and evaluated was random integer section. Listed below is the evaluation case and screenshots of the evaluation.

Evaluation Case:

1. Open Application.
2. Use Calculator App to add two numbers
3. Use Find the slope to calculate the slope.
4. Find the area and perimeter of a circle.
5. Find the area and perimeter of a triangle.
6. Use Midpoint Calculator to find the midpoint.
7. Use Random Integer to generate a random integer.

Screenshots of Evaluation:

1. Open Application. Graphical user interface, application, Word

   Description automatically generated
2. Use Calculator App to add two numbers Graphical user interface, application

   Description automatically generated Graphical user interface, application

   Description automatically generated with medium confidence
3. Use Find the slope to calculate the slope. Graphical user interface, application

   Description automatically generated
4. Find the area and perimeter of a circle. Graphical user interface, application

   Description automatically generated
5. Find the area and perimeter of a triangle. Graphical user interface, application

   Description automatically generated
6. Use Midpoint Calculator to find the midpoint. Graphical user interface, application

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7. Use Random Integer to generate a random integer. Graphical user interface, application

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All steps of evaluations were completed and where program was successful.

**Future Expansion**

There are three major expansions that we would like to implement soon. We like our default calculator to be able to perform more functions line sine and cosine and can take more than two values at a time. It is important to continue to expand on the default calculator since it is one of the most important parts of the application. The next major expansion we would like to implement is more shapes to find the area and perimeter for trapezoid and parallelogram. Will would also like to add the 3-dimensional version of the shapes will have implemented in the app so far. The last major change is to use an API to perform more random numbers and use to graph points.