

Alex Reilly

## GUI Design: (Disconnected)

Math Practice

About

+  =

☐ Data Corruption

☐ Display Summary

## Connected:

Math Practice

About

1 + 7 =

☐ Data Corruption

☐ Display Summary

Grade

☒ Grade 1 (1 - 10)

☐ Grade 2 (10 - 99)

☐ Grade 3 (100 - 999)

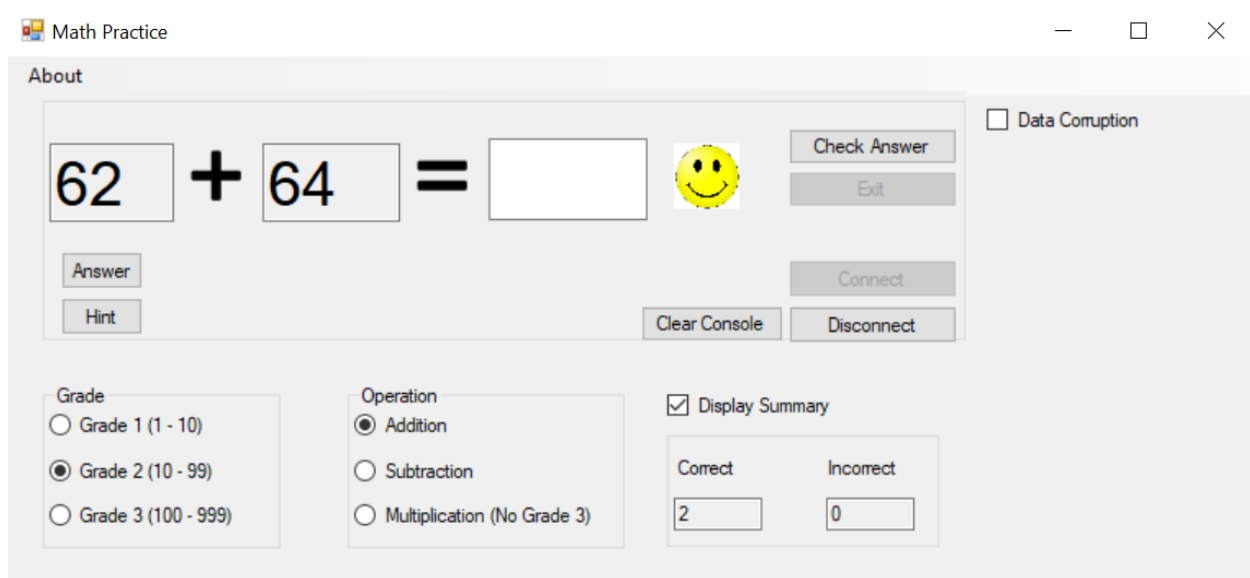
Operation

☒ Addition

☐ Subtraction

☐ Multiplication (No Grade 3)

Testing getting values and adding them  
Gui:

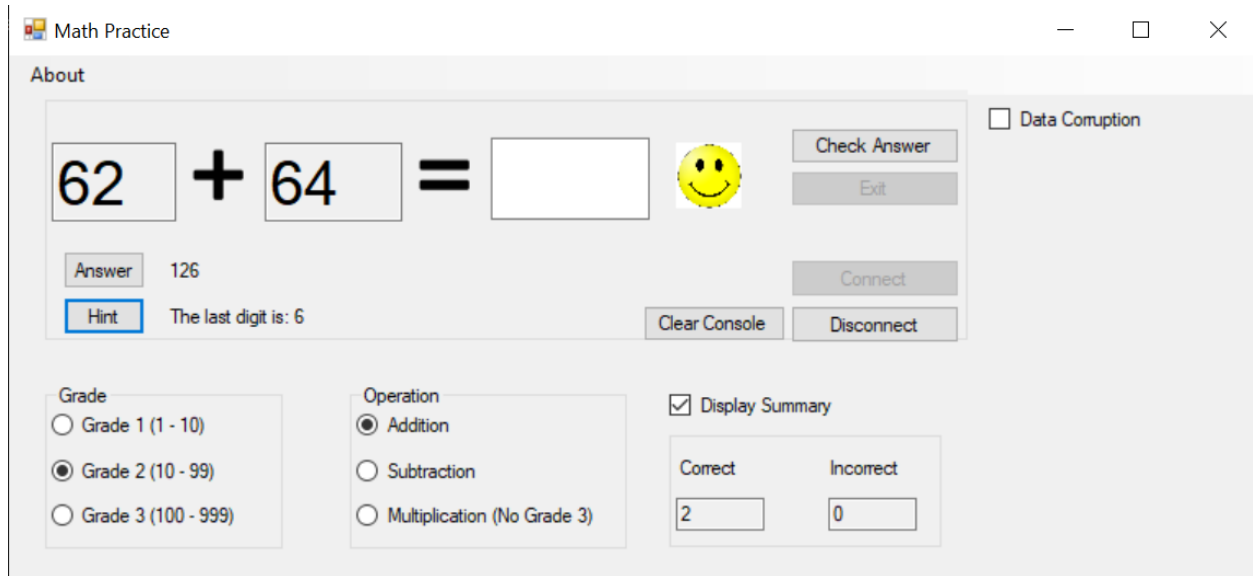


Console:

```
C:\Users\alexr\source\repos\Server\Debug\Server.exe
Received Command: SetValue
Received good integer
Set Values: 9, 4
Received Command: SetValue
Received good integer
Set Values: 78, 58
Received Command: Add
Received good integer
Received good integer
78 + 58 = 136
Received Command: Add
Received good integer
Received good integer
78 + 58 = 136
Received Command: SetValue
Received good integer
Set Values: 62, 64
```

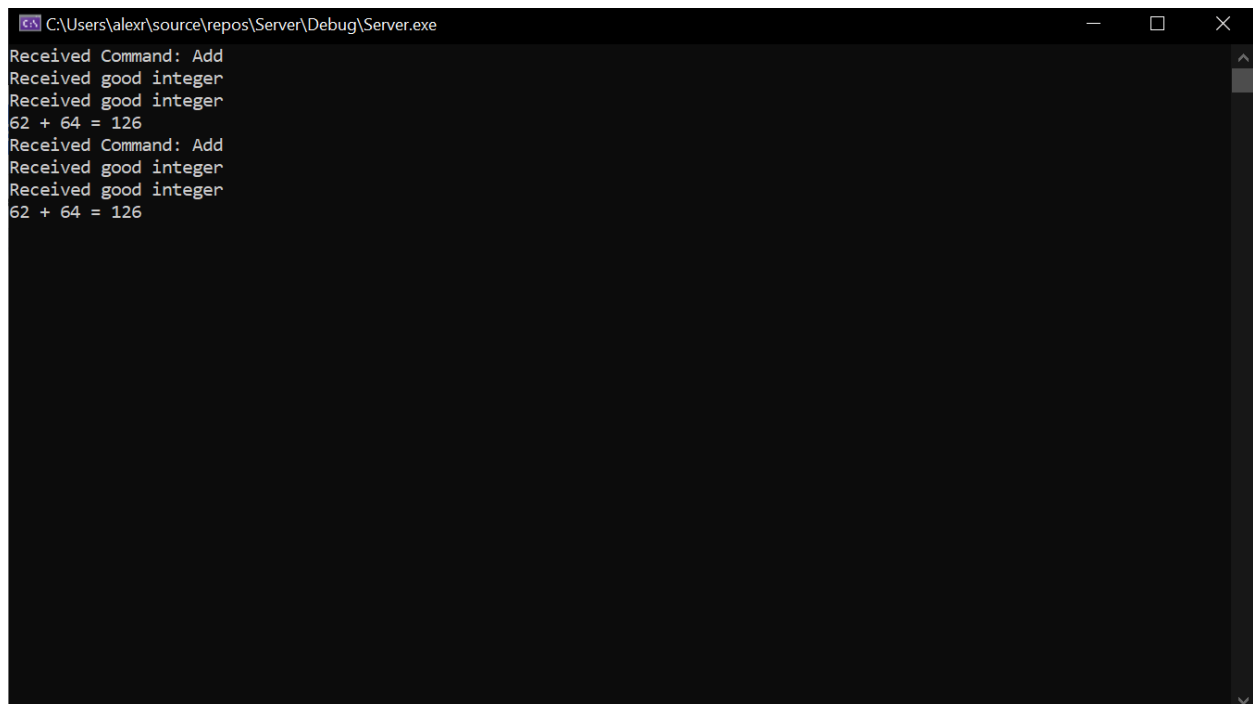
Answer and Add functions:

Gui:



The GUI window is titled "Math Practice" and features a standard Windows title bar with minimize, maximize, and close buttons. The main content area is labeled "About" and contains a math problem  $62 + 64 =$  followed by a yellow smiley face icon. Below the problem, there is an "Answer" field with the value "126" and a "Hint" button labeled "The last digit is: 6". To the right of the problem are buttons for "Check Answer", "Exit", "Connect", "Clear Console", and "Disconnect". A checkbox labeled "Data Corruption" is located in the top right corner. At the bottom, there are three sections: "Grade" with radio buttons for "Grade 1 (1 - 10)", "Grade 2 (10 - 99)" (which is selected), and "Grade 3 (100 - 999)"; "Operation" with radio buttons for "Addition" (selected), "Subtraction", and "Multiplication (No Grade 3)"; and a "Display Summary" checkbox which is checked. Below the "Display Summary" checkbox are two input fields labeled "Correct" and "Incorrect", with the values "2" and "0" respectively.

Console:




```
C:\Users\alexr\source\repos\Server\Debug\Server.exe
Received Command: Add
Received good integer
Received good integer
62 + 64 = 126
Received Command: Add
Received good integer
Received good integer
62 + 64 = 126
```

Switching modes:

Math Practice

About

91  $\times$  14 =



☐ Data Corruption

Grade

☐ Grade 1 (1 - 10)

☒ Grade 2 (10 - 99)

☐ Grade 3 (100 - 999)

Operation

☐ Addition

☐ Subtraction

☒ Multiplication (No Grade 3)

☒ Display Summary

Correct  Incorrect

```
C:\Users\alexr\source\repos\Server\Debug
Received Command: SetValue
Received good integer
Set Values: 27, 36
Received Command: SetValue
Received good integer
Set Values: 91, 14
```

All for task 1 seems to work fine. Commands are:

SetValue: set the values based off of the users grade and mode

Add: add two values and return the sum to client

Sub: Subtract two values and return the sum to the client

Mul: Multiply two values and return the sum to the client

Quit: Terminate the connection

ResetConsole: reset the server console

Also handles:

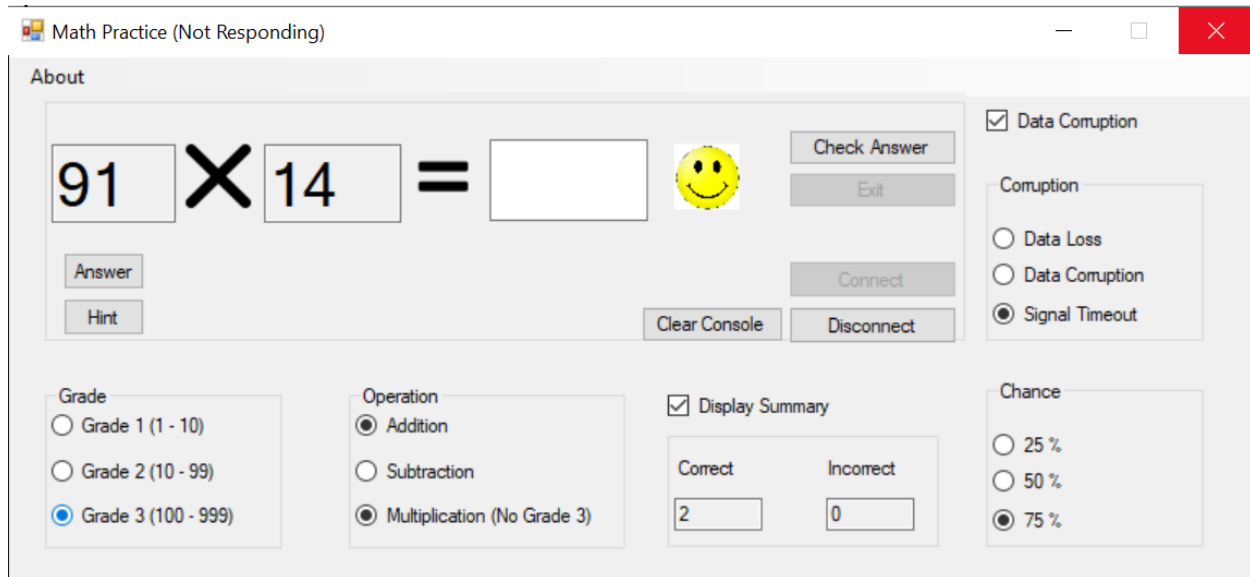
Forceful terminations: program crashes or user abruptly ends

This design seemed the most straightforward and works well with the program.

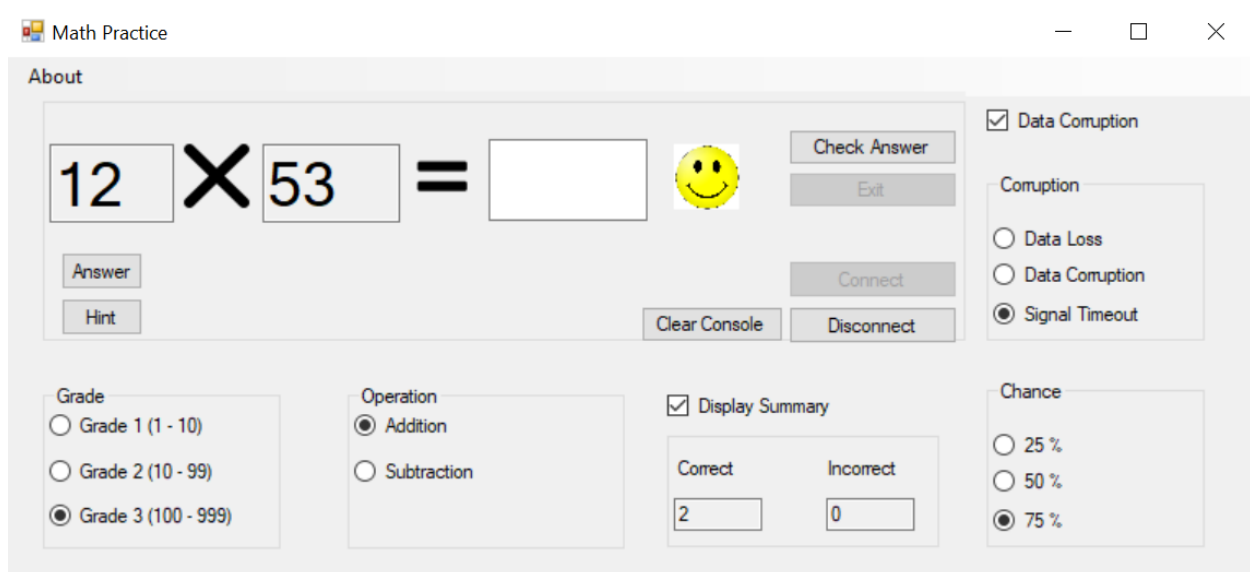
## Corruption Testing:

The signal timeout will be recognized by the server and correctly handled on that end, however the client will stop responding. Termination of the server will however finish the process.

```
C:\Users\alexr\source\repos\Server\Debug\Server.exe
Received Command: SetValues
Unable to read data from the transport connection: A connection attempt failed because the connected party did not properly respond after a period of time, or established connection failed because connected host has failed to respond.
Received good integer
Set Values: 12, 53
```



After server termination:



(Program now unusable)

Corruption works fine and so does data loss (known glitch: data corruption option must be used first for data loss to work).

Data corruption setvalues:

Math Practice

About

169 + 724 =

☒ Data Corruption

Corruption

☐ Data Loss

☒ Data Corruption

☐ Signal Timeout

Grade

☐ Grade 1 (1 - 10)

☐ Grade 2 (10 - 99)

☒ Grade 3 (100 - 999)

Operation

☒ Addition

☐ Subtraction

☐ Display Summary

Chance

☐ 25 %

☐ 50 %

☒ 75 %

```
server waiting for connections
New connection accepted, server thread is t1
Received Command: SetValue
Received good integer
Set Values: 1, 7
Received Command: SetValue
Unable to read data from the transport connection: A connection attempt failed because the connected party did not properly respond after a period of time, or established connection failed because connected host has failed to respond.
Received good integer
Set Values: 4, 0
Received Command: SetValue
Unable to read data from the transport connection: A connection attempt failed because the connected party did not properly respond after a period of time, or established connection failed because connected host has failed to respond.
Received good integer
Set Values: 169, 724
```

## Data Loss set values

Math Practice

About

62 + 64 =

Answer Hint

Check Answer Exit

Connect Clear Console Disconnect

Grade

☐ Grade 1 (1 - 10)

☒ Grade 2 (10 - 99)

☐ Grade 3 (100 - 999)

Operation

☒ Addition

☐ Subtraction

☐ Multiplication (No Grade 3)

☐ Display Summary

Chance

☐ 25 %

☐ 50 %

☒ 75 %

☒ Data Corruption

Corruption

☒ Data Loss

☐ Data Corruption

☐ Signal Timeout

```
Received Command: SetValue
Unable to read data from the transport connection: A connection attempt failed because the connected party did not properly respond after a period of time, or established connection failed because connected host has failed to respond.
Received good integer
Set Values: 478, 358
Received Command: SetValue
Unable to read data from the transport connection: A connection attempt failed because the connected party did not properly respond after a period of time, or established connection failed because connected host has failed to respond.
Received good integer
Set Values: 62, 64
```

## Data loss for checking response, hint, and getting answer

Math Practice

About

15 + 45 =

Answer Hint

Check Answer Exit

Connect Clear Console Disconnect

Grade

☐ Grade 1 (1 - 10)

☒ Grade 2 (10 - 99)

☐ Grade 3 (100 - 999)

Operation

☒ Addition

☐ Subtraction

☐ Multiplication (No Grade 3)

☐ Display Summary

Chance

☐ 25 %

☐ 50 %

☒ 75 %

☒ Data Corruption

Corruption

☒ Data Loss

☐ Data Corruption

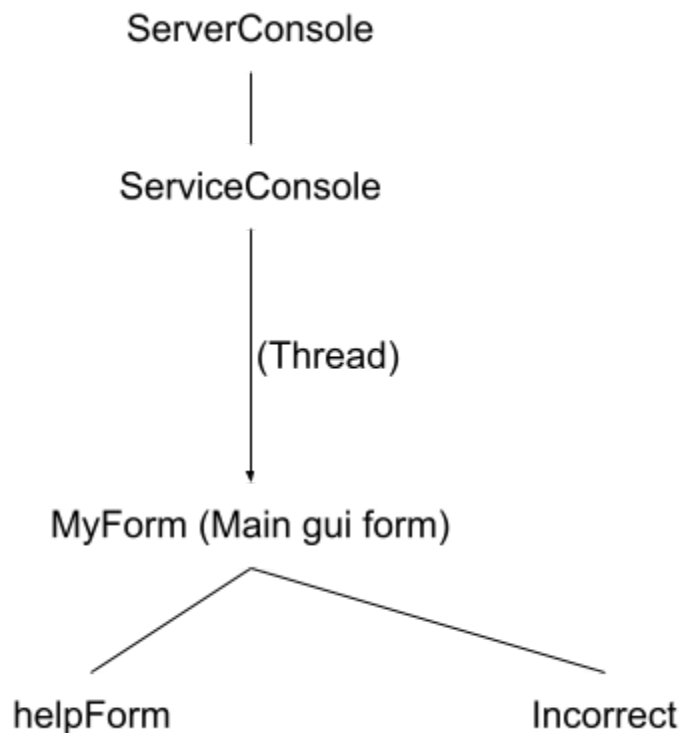
☐ Signal Timeout

```

Received Command: Add
Unable to read data from the transport connection: A connection attempt failed because the connected party did not properly
respond after a period of time, or established connection failed because connected host has failed to respond.
Received good integer
Received good integer
62 + 64 = 126
Received Command: Add
Unable to read data from the transport connection: A connection attempt failed because the connected party did not properly
respond after a period of time, or established connection failed because connected host has failed to respond.
Received good integer
Unable to read data from the transport connection: A connection attempt failed because the connected party did not properly
respond after a period of time, or established connection failed because connected host has failed to respond.
Received good integer
62 + 64 = 126
Received Command: Add
Unable to read data from the transport connection: A connection attempt failed because the connected party did not properly
respond after a period of time, or established connection failed because connected host has failed to respond.
Received good integer
Unable to read data from the transport connection: A connection attempt failed because the connected party did not properly
respond after a period of time, or established connection failed because connected host has failed to respond.
Received good integer
62 + 64 = 126
Received Command: SetValues
Unable to read data from the transport connection: A connection attempt failed because the connected party did not properly
respond after a period of time, or established connection failed because connected host has failed to respond.
Received good integer
Set Values: 15, 45

```

I designed the corruption portion as a separate hidden group box, as it should not be visible unless the user desires. It also allows for selection of corruption type and percentage occurrence, one at a time.





Protocol: Client will send server values, server will verify data integrity and then send back a string verifying the integrity as either "GOOD" or "BAD".