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CS 31

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Project 3 Report

1. Learning to take in one long string at once and iterate through it without a delimiter was tricky. I found the “processing strings” page on the website extremely helpful and used that method to read the commandString. I also had trouble converting digits in the commandString to integers. At first I used stoi(), but I ran into a lot of errors with that. After reading up on the note about characters, I used the same method to turn each individual character that was a digit into an int type. After creating the program, knowing when to return certain integers for errors and the index of the problem was difficult to track, so I spent quite some time debugging it. The trickiest part was finding syntactical errors first, even when distance values entered were out of bounds. My program would return the “Cannot perform command at position” message instead, so figuring out how to processing through the entire command string beforehand was tricky, but I ended up being able to do it by calling the function itself again on a substring of the rest of the command string.
2. **Pseudocode:**

Plotting horizontal/vertical line function:

If distance is zero or positive

Repeatedly while count is less than distance

If columns/rows is out of bounds

Break

If set in foreground

Set the character

Else

Set character if current spot is empty

Increment column/row

If distance is negative

Repeatedly while count is negative

If columns/rows is less than 1

Break;

If set in foreground

Set the character

Else

Set character if current spot is empty

Reduce column/row

plotLine function

if entered values are invalid

Return false

If the distance entered is within the grid

Plot the line using line function

Else

Return false

performCommands function

if commandString is empty

Return 0

While iterating through the commandString

if mode is entered & next character isprint()

Set mode and plot character

Else

Return syntax error

If clear command entered

Clear board, set to original plot character, and more to foreground

If line command entered

Set direction to horizontal/vertical

Convert distance to integer If distance out of bounds & no syntax errors Return out of bounds error

If distance out of bounds & syntax error found

Return syntax error

Return 0

1. **Test Cases:**

Empty string (“”)

Horizontal out of bounds (h45)

Horizontal out of bounds, uppercase (H45)

Horizontal out of bounds, negative (h-45)

Horizontal out of bounds, negative, uppercase (H-45)

Horizontal line with more than 2 digits (H18H-123#)

Vertical out of bounds (v56)

Vertical out of bounds, uppercase (V56)

Vertical out of bounds, negative (v-56)

Vertical out of bounds, negative, uppercase (V-56)

Vertical line with more than 2 digits (H20V405)

Foreground (f%)

Foreground, capital (F#)

Foreground, no character (f)

Foreground, capital, no character (F)

Background (b$)

Background, capital (B&)

Background, no character (b)

Background, capital, no character (B)

Starting command with digits (12C)

Starting command with unrecognizable letter (Q12)

Starting command with a negative sign (H12-13)

Unrecognizable character in the middle of command string (h12v+5f#)

Empty space when not after foreground/background command (V03C H123#)

Syntax error and out of bounds (v86f)

Out of bounds after multiple commands (H28V10H5V86)