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Project 3 Report

A brief description of notable obstacles you overcame.

1. There were a few obstacles that I had to overcome in the creation of this project. I was unsure of how to compile the commandString correctly. At first my code read “else if (isdigit(commandString[k + 1]) == true)”. However, this led to syntax errors occurring as I tried to run test cases of my code. I resolved the issue by deleting the “ == true” from the code. The problem with my initial code was that isdigit does not behave in the same way as a boolean statement like I was thinking it did. Taking out the “ == true” removed the syntax error because it no longer returned a value that would return false when it was actually true.

Another issue I had with the project was testing the program in g31. I couldn’t pass the test case run by “curl -s -L http://cs.ucla.edu/classes/fall19/cs31/Utilities/p3tester | bash”. The last test would fail when I tried to run this. I was able to resolve this by deleting the “ == true” from “isdigit == true” (the issue I mentioned above) and by deleting the “ == true” from “if (isprint(commandString[k + 1])) == true”. This issue was similar to the one I mentioned above. Removing this allowed my program to successfully run through the test cases in g31.

1. This program is designed to plot characters on a grid according to what the user of the program inputs. For instance, the input “h12” will plot 12 asterisks in a horizontal line at the top of the grid. The “plotLine” function in the program codesets a line segment of characters in the grid. The user has the option to print horizontally or vertically (left, right, up, or down) and have the option to print in the foreground or background of the grid. This function is called by the “performCommands” function, which parses the user’s input to know what should be printed. For example, a command string reading “v10” tells the program that the user the 10 asterisks to be printed vertically in the positive direction (v = vertical).

The main routine of the program is what prompts the user to enter a command string that the program will interpret and draw out onto the grid. It also serves to clear the grid of any characters, call the performCommands function to decipher the user’s command string, and perform the plotting commands. If there is a problem with performCommands, an error function is returned. An empty input just exits out of the main routine.

Pseudocode for the plotLine function is below - This function takes the distance of the line, the desired character, direction, starting position, and foreground/background position. It is called by the performCommands function.

if command string falls within the grid’s bounds:

if user wants to print in the foreground of the grid:

if user wants to print horizontally to the right,

print line from starting coordinate to endpoint

if user wants to print horizontally to the left,

print line from starting coordinate to endpoint

if user wants to print vertically and downwards,

print line from starting coordinate to endpoint

if user wants to print vertically and upwards,

print line from starting coordinate to endpoint

if user wants to print in the background of the grid:

if user wants to print horizontally to the right,

print line from starting coordinate to endpoint

if user wants to print horizontally to the right,

print line from starting coordinate to endpoint

if user wants to vertically and downwards,

print line from starting coordinate to endpoint

if user wants to print vertically and upwards,

print line from starting coordinate to endpoint

if user wants to plot a line segment with 0 distance,

plot a single point at desired location

Pseudocode for performCommands is below - This takes in the user’s command string, the current character, background or foreground, and bad position for the location of the string breaking (if it does break).

while looping through all the characters of the command string:

if the current character is H, h, V, or v,

if the subsequent characters are positive or negative,

call plotLine using the appropriate parameters

else break loop and indicate bad position at position of error

if else the current character is F, f, B, or b preceding another character,

set the new foreground or background accordingly and the new current character

if else the current character is C or c

clear the grid by setting every character to a space

else break loop and indicate bad position at position of error

1. Test Cases for the program

H10 and h10 - checks to see if the program can plot characters horizontally

V15 and v15 - checks to see if the program can plot characters vertically

B h12 and b h12 - checks to see if nothing prints in the grid because it's the ‘’ character

Bh12 and bh12 - checks to see if the characters printed in the background of the grid

F&h12 and f&h12 - checks to see if the characters will cover the background characters

H300 and h300 - testing what happens if the user puts something out of bounds of the grid

V300 and v300 - testing what happens if the user puts something out of bounds of the grid

H-3 and h-3 - testing what would happen if a “-” is entered in the command string

V-3 and v-3 - testing what would happen if a “-” is entered in the command string

C - tests to make sure if the command clears the characters on the grid

h12v3 - checks to see if the program can print in two directions at once

F\*h12B\*v12F&v2 - checks to see if the program can handle changing characters

Fwh12 - checks to see if the program can handle various characters

H12h-20 - checks to see if code breaks from going out of bounds horizontally

H5v5v-7 - checks if code breaks from going out of bounds vertically

S3h12 - checks if code breaks from unrecognized commands

b\*h12f&h3 - checks to see if program can print in background and then have characters in the foreground cover them up

h12h3 - checks to see if program can run two commands in the same direction

h12f&h-11- checks to see if program can overwrite characters going background

v12f&v-5 - checks to see if program can overwrite characters going background

H0 - checks to see if a single point can be plotted

h8f%v8f$h-8f&v-8 - checks if program can plot a rectangle