1. The first major obstacle was finding the distance after an ‘H’ or ‘V’ command – mostly because I didn’t thoroughly read the announcements section on the CS31 website that gave big hints about how to do the conversion from string to distance. Another obstacle was in finding errors – my initial implementation would return the first error found in the program, rather than the first syntax error, meaning that performance errors that occurred before syntax errors would be returned, which is incorrect. To solve the problem, I created a boolean that set to true after reaching a performance error, and only returned the performance error after checking through for all syntax errors.
2. Pseudocode

plotLine

returns false if invalid mode input

returns false if invalid direction input

returns false if distance would plot outside grid bounds

returns false if unprintable plotting character

plots horizontal line or vertical line based on direction input

return true

performCommands

repeatedly through commandString:

if command H

syntax error if no following digits at bad position where digit expected

find distance input

if distance within grid bounds

update column location

elif no previous performance error

set bad position to command start position

elif command V

syntax error if no following digits at bad position where digit expected

find distance input

if distance within grid bounds

update row location

elif no previous performance error

set bad position to command start position

elif command F

return syntax error if no following char or following unprintable char

update plot character to character input

update mode to FG

elif command B

return syntax error if no following char or following unprintable char

update plot character to character input

update mode to BG

elif command C

clear grid

reset row, column, plot character, and mode to default values

else (invalid command character)

syntax error at input location

if performance error found

return performance error at bad position

else return success

findDistance

finds numbers up to 2 digits immediately following H or V or a ‘-’ after H or V in string

returns false if no digits found

converts distance string to integer

if negative sign immediately following H or V command

multiply distance value by -1

1. Test cases

Test Reason

|  |  |
| --- | --- |
| H5V5 | horizontal and vertical functions plot properly |
| h5v5cf@h10b#h-5v6 | checks that lowercase commands work just as well |
| h5Cv10 | checks that clear function works |
| HA | non digit or ‘-’ character after H |
| VX | non digit or ‘-’ character after V |
| H-C | non digit after the negative sign |
| H-- | ‘-’ where a digit was expected |
| H123 | invalid command start character |
| H5B@H-5 | checking that background command works |
| H5F@H-5 | checks that foreground command works |
| H50 | out of bounds error returned |
| H5F | syntax error because no input after F |
| V5B | syntax error because no input after B |
| H60V-2H-50 | checks that only first performance error is printed |
| H8H | if no input after H |
| H8V | if no input after V |
| V0 | if distance is 0 |
| H00 | if distance is 00 |
| H5V6F\t | unplottable character after F or B |
| C HAX | checks only first syntax error is printed |