Project 3 Report

1. A brief description of notable obstacles you overcame.
   1. Handling the character that comes after the ‘H’ /’V’ command: There are multiple situations: 1. One number and the string of commands ends. 2. One number followed by another command. 3. Two numbers followed by another command. 4. Previous situations, but with a ‘-’ sign. When I’m handling the first number, I must determine whether the string of commands have ended or not after that number. If so, I must not try to access the character (which does not appear) after the last number, or a runtime error will appear. To overcome this obstacle, I used if(i!=commandString.size()-1) to determine whether the number is the last character of the command string, and handle different situations differently.
   2. I realized that I must check for the syntax of the string of commands before running it, so I implemented a function bool checkCommands(string commandString, int& badPos) that looks for syntax errors before running the program.
   3. During Phase 2, I found my code that checks the input for fgbg/vertical or horizontal distance/characters became long and very hard to read. Therefore, I implemented seperate functions such as ' validHorizDistance(**int** c, **int** distance)’ or ‘validFgbg(**int** fgbg)’, and call them in my plotLine() function in Phase 2, to make my program more abstract and easier to understand/debug.
2. Description of program design
3. Test data used: (Assume 20\*20 grid is set up)
   1. Testing the performCommands function:
      1. F@H2 [Test changing character command – Upper Case]
      2. f@H2 [Test changing character command – Lower Case]
      3. FxH3B@H5h-7 [Test Background command -Upper Case]
      4. C [Test clear screen command]
      5. Fxh3B@H5h-7 [Test Background command -Lower Case]
      6. c [Test clear screen command -lower case]
      7. H12h3Fxh-10H-1 [Test for 2 Digit, 1 Digit, 2 Digit with negative Sign, 1 digit with negative sign for command ‘h’ and ‘H’]
      8. v3V11FtV-10v-1 [Test for 2 Digit, 1 Digit, 2 Digit with negative Sign, 1 digit with negative sign for command ‘v’ and ‘V’]
      9. A3 [Test for syntax error command – expected ‘Syntax error at position 0’]
      10. H20F [Test for syntax error command – expected ‘Syntax error at position 3’]
      11. H20 [Test for out of bound commands - double digit number – expected ‘Cannot perform command at position 0’]
      12. H18h2 [Test for out of bound commands - single digit number – expected ‘Cannot perform command at position 3’]
      13. H-5 [Test for out of bound commands - single digit number with negative sign – expected ‘Cannot perform command at position 0’]
      14. H-20 [Test for out of bound commands - double digit number with negative sign – expected ‘Cannot perform command at position 0’]
   2. Testing the plotline function: