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# Writing Robot Planning

# Outline of the Problem to be Solved

The goal of the project is to design a software that will transmit commands from a file via a RS232 serial port to the writing robot to draw out text read from the file. The text’s font will be defined from the read file and each character will have a height between 4mm and 10mm. The text drawn should fit into a writing area of width 100mm.

In order to achieve this, the software should be developed using git for version control and have frequent commits in the code development.

The code should read font data from the “SingleStrokeFont.txt” file which contains instructions such as lifting the pen up/down and the coordinates for the writing robot. Then the code should obtain a height between 4mm and 10mm from an user input. The input will then be used to scale x and y movements such that the height of the letters will be in the range of 4mm and 10mm.

After that, the code should ask for the text file that contains the text to be drawn which is obtained through an user input. The code should also process a file containing text of any length and each word in the file should be processed and drawn by the writing robot before the next word from the file is read.

Finally, the code needs to generate G-code commands to the Arduino which will raise, lower and move the pen on the writing robot.

# Key Data Items

|  |  |  |
| --- | --- | --- |
| Name | Data type | Rationale |
| textHeight | float | Stores the height (4mm to 10mm) obtained through user input |
| scaleFactor | float | Converts font units to mm |
| textFileName | Char | Stores the text file obtained through user input |
| yPosition | float | Y coordinate |
| xPosition | float | X coordinate |

# Function Declarations

*Only include functions that you will develop.*

*Void readFontData(char \*SingleStrokefont)*

*Parameters: none*

*Reads the singleStokeFont file and stores data*

*Float getTextHeight(float textHeight)*

*Parameters: textHeight – user input of text height*

*Returns scaling factor based on text height*

*Void readTextFile(char\*fileName)*

*parameters: filename – name of the text file to be read*

*void generateGcode(char letter, float xOffset, float yOffset)*

*parameters:*

*letter – character to be drawn*

*xOffset – x coordinate for character*

*yOffset – y coordinate for character*

# Testing Information

|  |  |  |  |
| --- | --- | --- | --- |
| Function | Test Case | Test Data | Expected Output |
| readFontData() | Verify correct loading of text file | singleStrokeFont.txt | Correctly loaded text file |
| getTextHeight() | Verify scaling calculations | 10mm | 0.55556mm |
| readTextFile() | Verify correct loading of text file | fileName | Correctly loaded text file |
| generateGcode() | Verify x and y coordinates | “Hello World” | Correct font coordinates for x and y |

# Flowchart

included as separate pdf