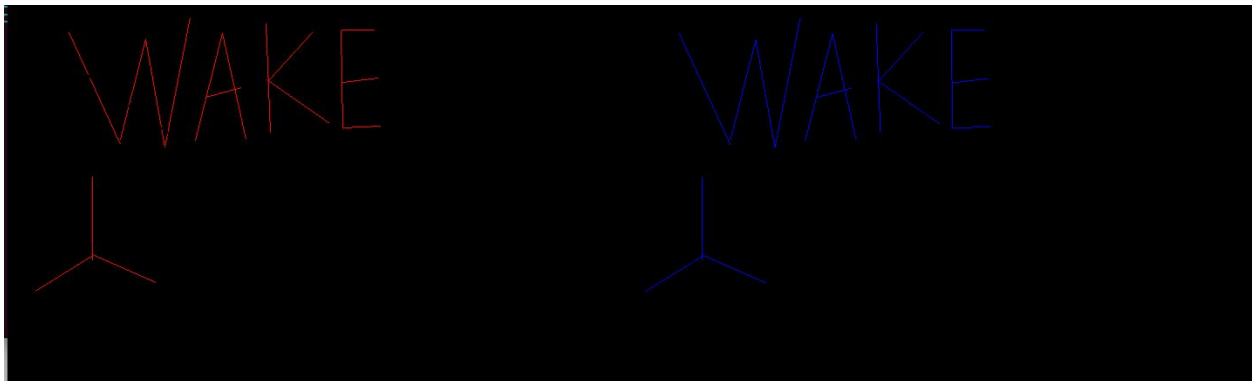
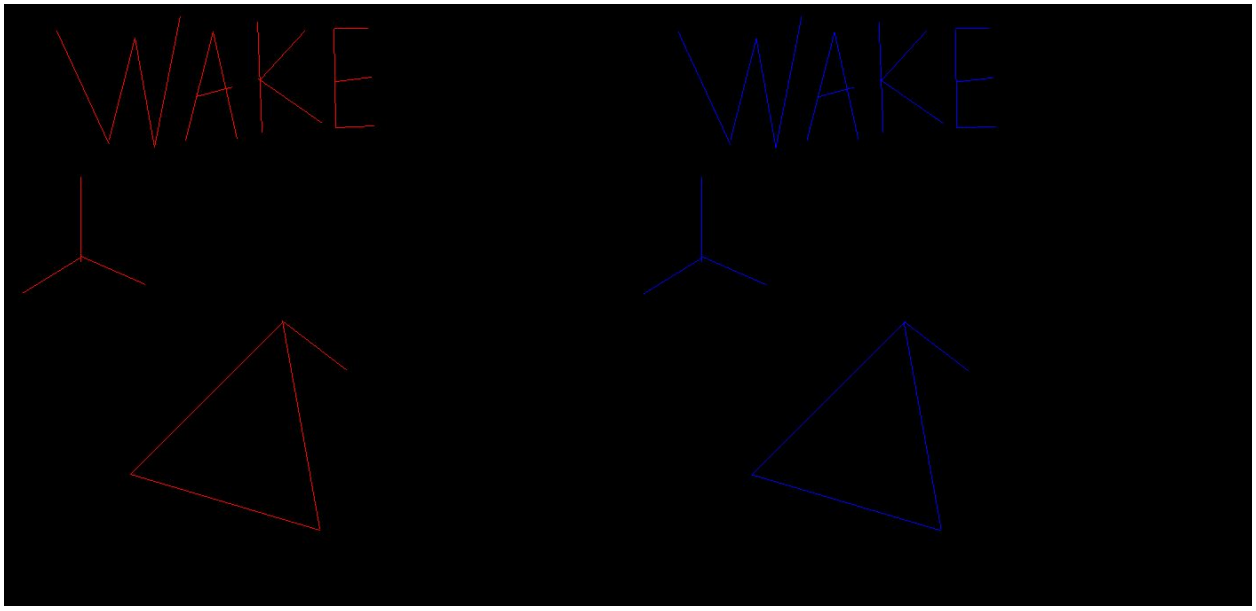
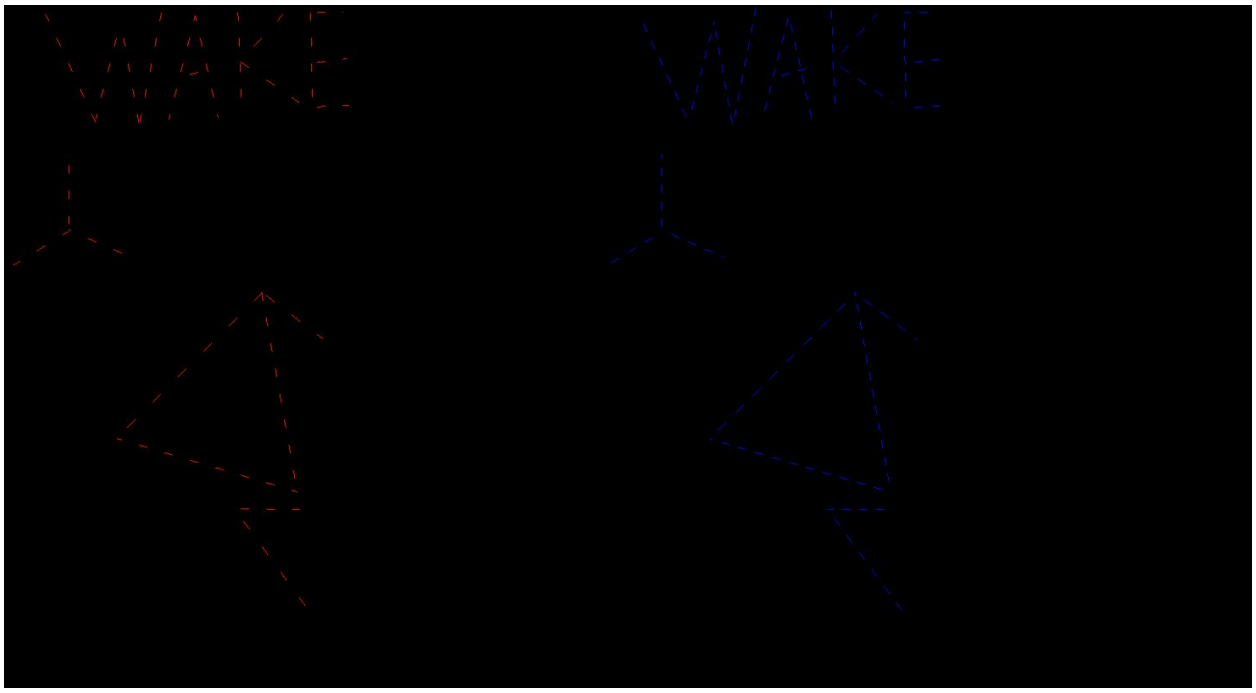
Michelle Tan

1. problem statement
    a. Create a draw line tool using 2 known algorithms
    b. Create a draw circle tool using known algorithm
    c. Style the lines using a stipple
2. algorithm design (with explanation of the major code if necessary)
    a. Bresenham algorithm
        i. Pick the pixel
        ii. From the pixel draw to the next pixel only changing y or x when the error is larger than ½
            1. For octantes 1,8,4,5 use x to plot change y for error
            2. For octantes 2,3,6,7 use y to plot change x for error
        iii. When you hit an error add or subtract one from y or x(depending on octant or slope) and remove 1 from error.
    b. Midpoint algorithm
        i. Pick the left most pixel
        ii. Draw that pixel
        iii. Start drawing the line from the left most pixel.
        iv. Depending on if the slope is positive of negative you can pick from moving east and northeast or east and south east
            1. For a positive slope you move east and north east until you get the line.
            2. For a negative slope you move east and south east until you get the line
        v. Establish a decision variable
        vi. Establish a midpoint between the bottom corner and top corner of the pixels(x+1,y) and (x+1,y+1)
        vii. If the decision variable is above the midpoint you pick the north east pixel
        viii. If it is below the midpoint you pick the east pixel
        ix. Do this until the current x or y is greater than the end x or y
            1. For octantes 1,8,4,5 use x to plot
            2. For octantes 2,3,6,7 use y to plot
    c. Stipple
        i. Draw a pixel if the X or Y pixel follows a regular pattern
        ii. Use the x pixel if you are plotting using x
        iii. Use the y pixel if you are plotting using y
        iv. Dash and dot are used to modify the length and frequencies of the breaks
3. instruction on how to run your program.
    a. Have GLUT pre-installed
    b. Compile using g++ -o assign1 assignment1.cpp -lglut -lGLU -lGL -lm in terminal
        i. This will create an executable called assign1
        ii. Run using ./assign1
    c. Left click continues the line
    d. Right click ends the line

    e. Use s to cycle through 2 stipple styles and one solid line
    f. Use t to toggle between bresenham and midpoint algorithms
4. sample images from screenshots.
5. In order (wake and coords, drawing bresenham, drawing stipple bresenham,drawing midpoint , drawing stipple midpoint)



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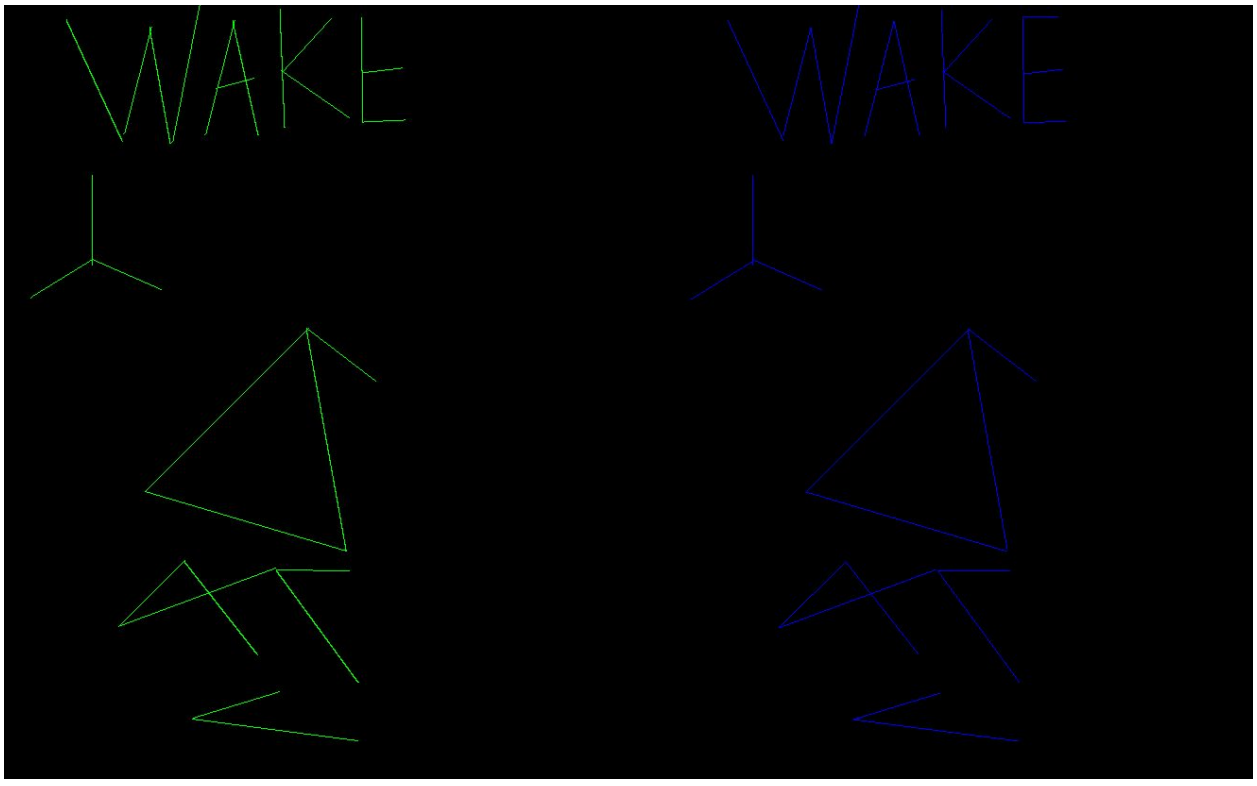
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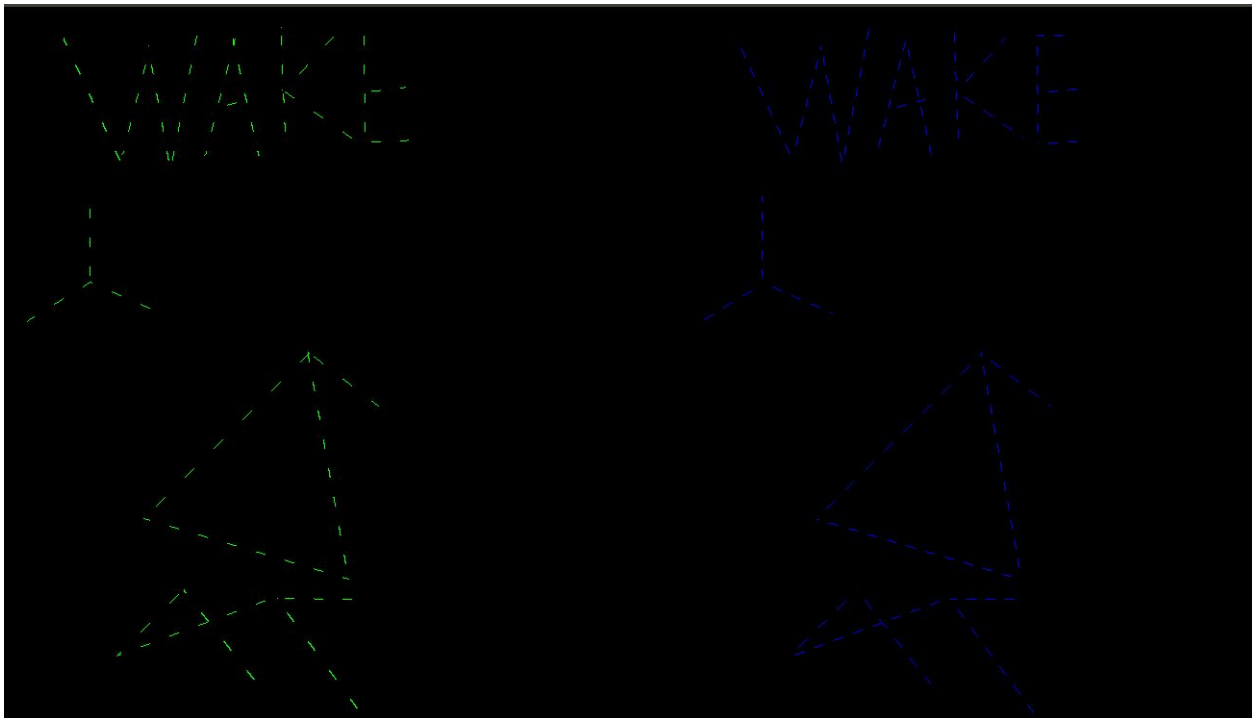
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