

## CSE108 – Computer Programming Laboratory

### Spring 2022, Lab 1

*This lab will be graded on a scale of 100. No collaboration is permitted.*

**Part 0.** Write a complete C program (in main.c) that takes the coordinates of two points  $A(x_1, y_1)$  and  $B(x_2, y_2)$  on the cartesian plane (as integers) and perform the following tasks. *PS: Don't use any library other than stdio.h.*

**Part 1. (25 pts) Midpoint Calculation:** The program calculates the coordinates of the midpoint of these points and prints it out.

**Part 2. (25 pts) Slope Calculation:** The program calculates the slope of the line that passes through these points and prints it out.

**Part 3. (25 pts) Area Calculation (Circle):** Assuming that the line segment between A and B is the diameter of a circle and midpoint is the center, the program computes and prints out the area of this circle.

**Part 4. (25 pts)** Create a makefile to compile and run the program by creating main.o and main.out files respectively. Your **makefile** should perform the following commands: **clear** (the terminal), **clean** (the files), **compile** and **run**.

#### Formulas:

Input Points :  $A(x_1, y_1)$  and  $B(x_2, y_2)$

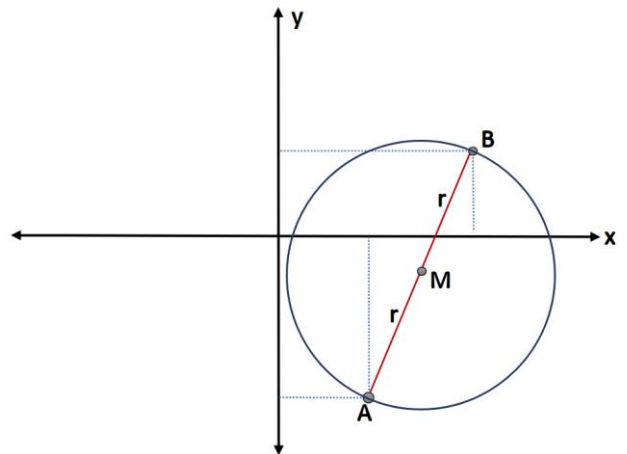
$$\text{Midpoint : } M(x, y) = \left( \frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

$$\text{Slope : } m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$\text{Area of the circle : } A = \pi r^2 \quad (\pi = 3.14)$$

Distance between two points  $A(x_1, y_1)$  and  $B(x_2, y_2)$ :

$$AB = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$



#### Example input and output:

```
x1: 5
y1: 6
x2: -10
y2: -5

Midpoint: M(x,y) = (-2.5, 0.5)

Slope: m = (0.7)

Area: A = 271.6
```