United International University (UIU)

Dept. of Computer Science & Engineering (CSE)

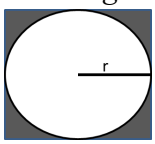
CSE 1110: Introduction to Computer Systems

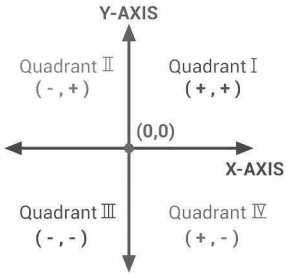
Final Exam, Time: 45 Minutes Marks: 25

A

Name:
Id:

Note: Answer all the questions.

1.	A circle inside a square is given in the following figure. Write a C program to compute the shaded area. You can only take the **Radius, r** of the inner circle and the **Side, a** of the Square as input from the user. ● *Area of triangle = 3.14159 * r * r [r is the radius of the circle]* ● *Area of Square = a * a [a is the length of the side of the square]*  **Sample Input** / **Sample Output** 7 / Shaded Area = 20.7256 3	[5]
2.	Write a C program to calculate the area of geometric shapes based on user input. The program will first allow the user to choose between calculating the area of a triangle (choice 1) or square (choice 2). After that the program will take either the base and height of a triangle or side of a square and compute the area. ● *Area of triangle = 0.5×base×height* ● *Area of Square = side×side* **Note:** You may assume that the value of π is 3.14159. **Sample Input** / **Sample Output** Choice: 2 5 / The area of the square is: 25 square units Choice: 1 6 8 / The area of the triangle is: 24 square units Choice: 4 / invalid	[5]

3.	Suppose you are situated at a point in the XY coordinate system. Now, write a C program that takes input of two floating point values **x** and **y** as your coordinate point and determine in which quadrant your coordinate point lies.  **Sample Input** / **Sample Output** 2 3 → First Quadrant -2 3 → Second Quadrant	[5]
4.	Take **A, B,** and **C** as inputs. Find the minimum of the three numbers. **Sample Input** / **Sample Output** 11 30 20 → Minimum: 11 15 19 5 → Minimum: 5	[5]
5.	Write a program that will take three inputs: one integer **(n)** followed by two floating point numbers (**a**, **b**). The program will print according to the following rules based on the value of **n**. You must use **switch case statements**. *For n=1, print a+b;* *For n=2, print a-b;* *For n=3, print a*b;* *For n=4, print a/b; [b can not be zero]* *For any other values of n, print "Invalid"* **Sample Input** / **Sample Output** 1 2.5 3 → 5.5 5 1 9 → Invalid	[5]

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B

Name:
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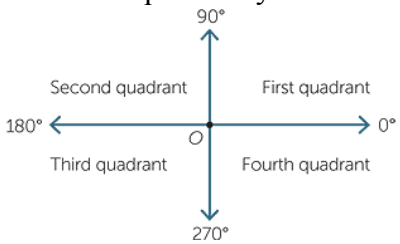
Note: Answer all the questions.

<table>
<tr>
<td>1.</td>
<td>Find the Area and Circumference of a Circle with its standard equation.
The equation of a circle is: $(x-h)^2 + (y-k)^2 = r^2$. Where, (x,y) is a point on the circle, (h,k) is the center coordinates of the circle, and r is the radius of the circle.
The user will input x,y in one line and h,k in another line. The program will output the area ($\pi * radius^2$) and circumference ($2*\pi*radius$) of the circle. Use formatting of output as following:
<table>
<tr><th>Sample Input</th><th>Sample Output</th></tr>
<tr><td>Enter x,y coordinates of a point on Circle: 1 2
Enter center coordinates of the Circle: 2 5</td><td>Area = 31.416
Circumference = 19.869</td></tr>
</table>
</td>
<td>[5]</td>
</tr>
<tr>
<td>2.</td>
<td>Write a C program to convert temperatures between Celsius (C) and Fahrenheit (F) based on the user input. The program will allow the user to choose between converting temperatures from Celsius (choice 2) to Fahrenheit (choice 1) or vice versa.
Temperature conversion equations:
<ul>
<li>Celsius to Fahrenheit: $F = 9/5 \times C + 32$</li>
<li>Fahrenheit to Celsius: $C = 5/9 \times (F - 32$</li>
</ul>
<table>
<tr><th>Sample Input</th><th>Sample Output</th></tr>
<tr><td>Choice: 2
C: 25</td><td>The temperature in F is: 77.00°F</td></tr>
<tr><td>Choice: 3</td><td>invalid</td></tr>
<tr><td>Choice: 1
F: 77</td><td>The temperature in C is: 25.00°C</td></tr>
</table>
</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Suppose you are situated at an angle (in degree) with the X axis of the XY coordinate system. Now write a C program that takes input of a floating point angle theta (0 < theta < 360) and determines in which quadrant you are situated at.


</td>
<td></td>
</tr>
</table>

Sample Input	Sample Output
45	First Quadrant
135	Second Quadrant

4. Write a C program that will take three scores (between 0 and 100) of ICS, English, and BDS courses. Find the *average (mean) of* those marks. Use the average score to *check* whether the student is brilliant, good, moderate, or bad using the following criteria:

- Brilliant: 89 to 100
- Good: 74 to less than 89
- Moderate: 55 to less than 74
- Bad: 0 to less than 55

Sample Input	Sample Output
75 80 87.5	Average = 80.33 Quality = Good
95 85.5 97.5	Average = 92.67 Quality = Brilliant

5. Write a program that takes the last **4 digits of your student id** as input. The program will first find the **last digit of your student id** from your input. The program then uses that digit and switch case statement to find the summation of the next 3 numbers after that digit in the natural number sequence. If the digit is 5, the next 3 numbers are 6, 7, and 8, and the sum is 6+7+8=21. [5]

Sample Input	Sample Output
1145	Sum: 21
1123	Sum: 15