National University of Computer & Emerging Sciences

Lab # 6

For

Programming Fundamentals - Lab

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FAST School of Computing

Instructions:

1. Attempt all your questions on visual studio, once done paste your code and it's screenshot in a word file clearly marking its question number
2. Plagiarism is strictly prohibited.
3. Late submissions are not allowed.
4. This is a solo programming task.
5. Write your roll numbers, lab#, section and date in the name of the file e.g., "ROLLNUM_LAB#_SECTION"
6. Test your code with at least **three** sets of inputs.

Q1	10 Marks

Use the criteria given bellow, take the percentage scored by the user and print the corresponding letter grade on screen.

You cannot use AND, OR operators, or nested if conditions.

Traditional Grading Scale	
Letter Grade	%
A	90-100%
B	80-89%
C	70-79%
D	60-69%
F	0-59%

For an invalid inputs print "Invalid input, please enter in the range of 0-100.

Q2	25 Marks

The user would first input one number followed by 12 numbers. The first number user would under would always be a 3-digit integer. Now your program is to check if in the following 12 numbers being entered by the user were you able to find the 3 digits of the number anywhere.

Sample:

Input: 312
12 Numbers: 32
3 ←
4
5
6
55
77
2 ←
999
0
-1
1 ←

Output: Digits 3-1-2 of the number "312", were found in the input numbers.

Q3	10 Marks

You are tasked with creating a C++ program that implements a switch-based menu for calculating the areas of various shapes. The program should provide the user with four options to choose from: Circle, Rectangle, Triangle, and Square.

The program should utilize the following area formulas:

1. **Circle**:
   - Area Formula: $\pi \times r^2$
   - Where r represents the radius of the circle.
2. **Rectangle**:
   - Area Formula: $\text{length} \times \text{width}$
   - Where `length` represents the length of the rectangle and `width` represents the width.
3. **Triangle**:
   - Area Formula: $\frac{1}{2} \times \text{base} \times \text{height}$
   - Where `base` represents the base length of the triangle and `height` represents the height.
4. **Square**:
   - Area Formula: $\text{side} \times \text{side}$
   - Where `side` represents the length of a side of the square.

Your program should display a menu to the user, prompting them to choose a shape. Once the user selects a shape, the program should ask for the necessary dimensions (e.g., radius, length, width, base, height, side) and then calculate and display the area.

Ensure that the program handles invalid input gracefully, providing appropriate error messages.

Q4	15 Marks

You are developing a program for a company that evaluates job applicants. The evaluation is based on multiple criteria, each with different weights. The criteria are:

- Technical Skills Assessment (40% weight):
- Applicants are required to take a technical skills test, which is scored out of 100.
- Interview Performance (30% weight):
- Applicants are rated on their performance in a technical interview, which is scored out of 100.
- Experience (20% weight):

Applicants are awarded points based on their years of experience. Each year is worth 10 points, up to a maximum of 50 points.

Additional Qualifications (10% weight):

Applicants can earn additional points based on extra certifications or qualifications, which are scored out of 100.

The total score is calculated as follows:
TotalScore=(TechnicalSkills×0.4)+(InterviewPerformance×0.3)+(ExperiencePoints×0.2)+(AdditionalQualifications×0.1)

Write a C++ program that:

a) Takes input for the technical skills score, interview performance score, years of experience, and additional qualifications score.
b) Calculates the total score based on the provided weights and criteria.
c) Determines if the applicant meets the minimum criteria for being considered or not:

Criteria:

- Total score threshold of 70 score.
- Technical Skills Assessment threshold of 65 points
- Additional Qualifications threshold of 5 points

The program should then output an appropriate message indicating whether the applicant is eligible for further consideration or not.

You cannot use AND OR operators for the above question.