National University of Computer and Emerging Sciences, Lahore Campus

Course:	**Programming Fundamentals**	**Course Code:**	**CS 1002**
Program:	**BS (CS)**	**Semester:**	**Fall 2023**
Due Date	**24-Sep-2020 at 11:59 pm**	**Total Marks:**	**65**
Section:	**1E & 1J**	**Page(s):**	**4**
Type:	**Assignment 1**		

Important Instructions:

1. You have to upload only .cpp file. Assignment in any other format (extension) will not be accepted and will be awarded with zero marks. You have to make a zip file and upload it onto the google classroom submission folder. For question 1, name your solution file with your roll number, i.e., Q1_22L_1111.cpp. Similarly, you can name other questions.
2. You are not allowed to copy solutions from other students. We will check your code for plagiarism using plagiarism checkers. If any sort of cheating is found, negative marks will begiven to all students involved.
3. For each passing day after deadline, 20% of the marks will be deducted. Three days after the deadline, no submission will be accepted.

Question 1: **[Marks: 10]**

Write a C++ program that takes three integer numbers from the user. Your program will first print the integers in ascending order and then in descending order. You cannot use arrays to solve this problem. Assume all numbers are distinct.

For example: if the integers given by the user are 67, -5, 3, then the ascending order printing will be: -5,3, 67 and descending order printing will be 67, 3, -5.

Question 2: **[Marks: 20]**

You have to develop a restaurant order payment application. For Example, your restaurant is offeringthe following meals.

Code	Meal	Per kg Price in Pakistani rupees
1	Chicken Handi	1800
2	Chicken Karahi	2000
3	Chicken Tikka	2200
4	Chicken Haleem	500
5	Creamy Chicken	2500

Your program should print the name of dishes along with their corresponding codes so that a user can select one of the dishes by using its code. For example, if the user selects code 1, then it means Chicken Handi, 2 means Chicken Karahi, so on and so forth. If the user has entered an invalid code, your program will print some error message and terminate.

After the user has been asked the dish that he wants to buy, your program will ask the user to enter the quantity of the dish that he wants to buy in kilograms. The quantity will be greater than 0. If the user has entered an invalid quantity, then print some error message and terminate the program. After that, the

program should ask from the user about currency in which he/she wants to give payment. For this assignment, you are required to use three currencies. One is Pakistani rupee, second is dollar and the last one is euro. Use 1 for Pakistani rupee, 2 for euro, and 3 for dollar. If the user has entered an invalid option, then your program will print some error message and terminate.

After that, your program will calculate the meal price, sales tax on the meal price and total price of the meal (calculated after adding meal price and sales tax).

For calculating sales tax, you can use meal price in rupees which is hard coded in this case, and calculate sales tax on it using the table given below.

Meal Price	Sales Tax applicable
Less than or equal to 1000	No sales Tax on it.
Greater than 1000 and less than or equal to 3000	2% of meal price.
Greater than 3000	5% of meal price.

After calculating the sales tax, the program will calculate the total amount or price payable by using the following formula:

Total _Amount = Meal_Price + Sales_Tax

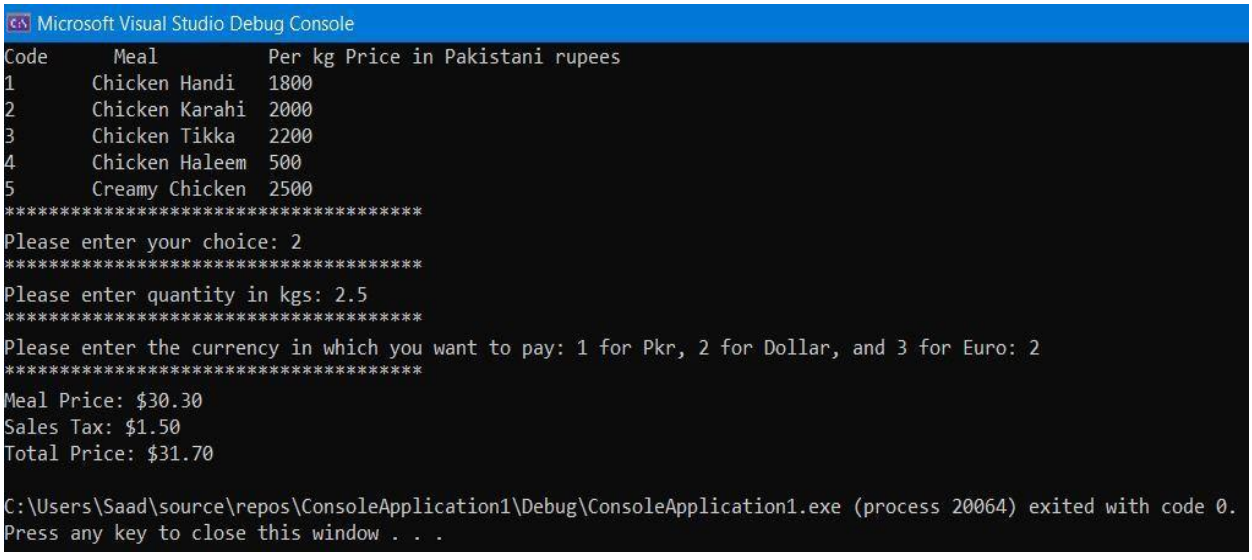
Hint: You can calculate everything in Pakistani rupees, and then convert them into the desired currency.

After calculating the total amount in rupees, you are required to convert the amount into the desired currency (based on the user's choice). For example, if the user selected rupees then simply display final price, i.e., (Total Amount = Meal_Price + Sales_Tax) in rupees but if the user selected dollar or euro, then simply convert the final meal price that you calculated earlier (in rupees) into dollar or euro according to the currency exchange rate. Also display the amount of sales tax and the meal price excluding sales tax.

Note:
Use current exchange rate for this assignment as given below:

1 dollar	**165 rupees**
1 euro	**193 rupees**

Sample Output:



Question # 3: **[Marks: 5]**

Write a program which will take at max: a six digit number and output each of its digit in words, (Bonus) if the number is less than 6 digits it should not out print initial zeros. If the number is greater than 6 digits then it should output wrong input.

Sample Input: 651432
Output: Six Five One Four Three two
(**Bonus**) Sample Input: 1432
Sample Output: One Four Three two.

Question # 4: **[Marks: 5]**

Write a program which takes as input 3 points and tell whether these points are the coordinates of isosceles or equilateral or right angled or scalene triangle.
Sample Input:

P1	0	0
P2	**1**	**0**
P3	**1**	**1**

Output: Right Angle Triangle

Question # 5: **[Marks: 5]**

Take 4 coordinates of the Rectangle and a point P. Your program should be able to tell whether P lies inside the Rectangle or Not.
Sample Input:

P1	0	0
P2	**2**	**0**
P3	**2**	**2**
P4	**0**	**2**
Point (P)	**1**	**1**

Output: P lies inside Square

Question # 6: **[Marks: 10]**

Write and run a program that plays the game of "Rock, paper, scissors." In this game, two players simultaneously say (or display a hand symbol representing) either "rock," "paper," or "scissors." The winner is the one whose choice dominates the other.
The rules are: paper dominates (wraps) rock, rock dominates (breaks) scissors, and scissors dominate (cut) paper. You can use r = rock, p = paper, s = scissors
Sample Output:

```
Enter R for rock, P for paper, or S for scissors:
r p
Player 2 Wins!
Player one enter: r
Player two enter: p
```

Question # 7: **[Marks: 5]**

Write a C++ program to decide whether the given three numbers are pythagorean triple or not. This means you will take three numbers as input from the user and check if any order of the number holds the property $c^2 = a^2 + b^2$.

Question 8: **[Marks: 5]**

Write a C++ program to print following patterns using only a single cout statemen.

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(b)

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(c)

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(d)

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BEST OF LUCK!