National University of Computer and Emerging Sciences, Lahore Campus

Course:	**Programming Fundamentals**	**Course Code:**	**CS-1004**
Program:	**BS (Computer Science)**	**Semester:**	**Fall 2022**
Deadline:	**24 Sept 22 (11:59 PM)**	**Total Marks:**	**70**
Section:	**BCS-1J and BSE-1C**		
	Homework-2		

Instruction/Notes:

Task#1:

Fast NUCES Lahore has decided to organize a special category for FPS gamers in their upcoming SOFTEC event for this year. It has been planned to hold a tournament for Valorant players. 3 Teams will be competing with each other on the LAN event. There will be a total of 2 matches. However, a system is needed to determine match standings sorted by Team Skillset. Each Team's Level can be determined by summation of 10 percent of each team player's ACR (Average Combat Rate). The ACR for each Team Player has been given below:

Team 1	Team 2	Team 3
23	102	134
124	90	91
56	23	79
67	76	119
98	34	78

Your Task is to code a program which:

- Calculates each Team's Level
- Find and displays the match standing determined by team level

Sample output for above data:
Strongest Squad's ACR: 50
---Standings---
Team 1 VS Team 2
TBD VS Team3

Task#2:

Write a program that prompts the user to enter the day and the month (integer values). Your task is to print the relevant month and the month. e.g., if the day is 7 and month 5 then output should be "Day: Sunday, Month: May". Value of day and month should be in the range of (1 to 7 and 1 to 12) respectively.

Task#3:

In this program your task is to determine whether the You Tube channel is monetized or not. If the channel is monetized then check whether the channel received any reward from You Tube i.e., (silver, gold or diamond button). Display a message like "channel is monetized and rewarded by you Tube with silver button" if the required conditions are fulfilled.

Assume that following is the monetization policy of You Tube:

- At least 1000 subscribers
- Accumulated watch time of 4000 hours in the past 12 months
- At least 2 videos per month in the past year
- At least 10 views on each video and 40% likes of the total number of views.

Reward Policy:

- Silver Button (more than or equals to 100K subscribers)
- Gold button (more than or equals to 1 million subscribers)
- Diamond button (more than or equals to 10 million subscribers)

Display a proper message in case of invalid input. Similarly, the program should display most relevant message on console. e.g., if the number of subscribers are more than 1 million then silver button is also one of the reward since 1 million is greater than 100K but the most suitable reward is Gold button here so print the message e.g., "Channel is monetized and rewarded by You Tube with diamond button".

Task#4:

Write a program that prompts the user to enter the current date (int value to store the day), current month (int value), current year (int value). You need to check whether the data entered by the user is valid or not. Check the validity of input for the following cases:

- All the values should be positive
- Month value should not be greater than 12.
- If the month value is 2 (i.e., Feb) then date should not be greater than 29.
- If the month value is (4, 6, 9, or 11 i.e., April, June, Sept, Nov) then date should not be greater than 30. Similarly for the remaining months the date should not be greater than 31.
- The year should be a 4-digit number for this program.

Your task is to **print the message "Valid date" if all the conditions are satisfied otherwise print "invalid date" if the provided input failed for any of these conditions.** The next task is to determine whether it is magical date or not. A **magical date is one in which the product of day and month is equal to the year** (e.g., 9 *10 = 90 so if the date is 9, month is 10 and the year 1990 then it is a magical date. You can only use last two digits of year for this comparison like here we are using only 90, another example is 8*9 = 72 so if the date is 8, month is 9 and the year is 1972 then it will be a magical date since date times product is equal to the last two digits of year).

Task#5

Write a program to determine the impact factor and the category of the journal. Impact factor is calculated by dividing the number of citations in the JCR (journal citation report) year by the total number of articles published in the past two years**.** Assume that the category of journal can determined by:

- impact factor (2 to 3.9) category Q4
- impact factor (4 to 5.9) category Q3
- impact factor (6 to 7.9) category Q2
- impact factor (greater than or equals to 8) category Q1

Your program should only accept positive values where number of citations should be greater than or equals to the double of the count of publications. Get the number of publications and citations from user.

Task#6:

A cellular service provider offers three weekly packages. The description of the packages is given below:

- **Mega Package: (**Subscription charges: 599**)**
    a) Offnet Minutes: 1500 (1.5 rupee per minute will be charged for additional minutes)
    b) on-net Minutes: 2500 (0.75 rupee per minute will be charged for additional minutes)
    c) SMS: 700 (0.5 rupee per message will be charged for additional messages)
    d) Mobile Data: 10 GB (8.5 rupee per GB will be charged for additional data usage)
- **Supreme: (**Subscription charges: 1199**)**
    a) Offnet Minutes: 2000 (1.25 rupee per minute will be charged for additional minutes)
    b) on-net Minutes: 3000 (0.65 rupee per minute will be charged for additional minutes)
    c) SMS: 1000 (0.45 rupee per minute will be charged for additional minutes)
    d) Mobile Data: 20 GB (6.5 rupee per GB will be charged for additional data usage)
- **Premium: (**Subscription charges: 2500**)**
    a) Offnet Minutes: Unlimited
    b) on-net Minutes: Unlimited
    c) SMS: Unlimited
    d) Mobile Data: Unlimited

Display the package details to the user. Now prompt the user to enter his requirements i.e., offnet minutes, on-net minutes, SMS, and mobile data. Your task is to suggest the most suitable (economical) package to the user. Your program should only accept valid input values.

Check the validity of input for the following cases:

- Since there are 10,080 minutes in the week so input value for minutes should be in the range of 0 to 10,080
- All values should be positive.

Task#6:

Write a program that calculates the fare of your uber ride. Prompt the user to enter the following information:

- Vehicle type (display a proper menu first, like Enter 1 for car, Enter 2 for auto, Enter 3 for bike, Enter your choice and then get the input in an int variable say choice. Store the name of relevant vehicle in a string variable. e.g., you have a string variable v_type and the value entered by the user is 3 then store car in the string variable like v_type = "car").
- Base fare (integer amount)
- Time (a variable of string data type, Enter the time in 24-hour clock and we are taking the assumption that this time value is already in the range of 1201 to 2359 where 1201 represents 12:01 pm and 2359 represents 11:59 pm. You can convert this string value into integer by using a built-in function stoi (string to integer). Like stoi("1438") will convert this string into integer. You may have to include string library in the code for this purpose. The reason to convert this data into int is you need to check the time for a particular range later on in this program and you can't perform that task with string data type).
- Waiting time (integer value minutes)
- Total journey time (integer value in minutes)
- Distance from pickup location to the destination (integer value in kilometers)
- Promo Code (char variable that stores 'y' or 'Y' for yes and 'n' or 'N' for not)
- Per min charges (integer value)

- Per km charges (integer value)
- Discount (integer value to get the percentage of discount if the user has promo code)
- Surcharge Rate (integer value to get rate of surge if it is a peak hour)
- Surge (a char variable that either store ‘y’ or ‘n’. You don’t need to prompt the user to enter any data rather determine whether the surge is applicable or not. Surge is basically the price hike in peak hours. In our scenario the peak hours are from 1pm to 3 pm and from 7pm to 9pm i.e., 1300 to 1500 and from 1900 to 2100).

Your task is to calculate the trip fare by following the given instructions

- If the waiting time is greater than 3 minutes, then charge 50 rupees as a penalty.
- Calculate the trip fare. If the vehicle is bike, then simply calculate trip fare by adding the base fare, journey time charges, distance charges and the waiting penalty. If the vehicle is auto, then the trip fare will be doubled and if it is a car then trip fare will be tripled.
- If it is a peak hour i.e., surge is ‘y’ then calculate the surge amount on the trip fare by using the surge rate and add in the trip fare.
- If the user has promo code, then calculate and deduct the discount from the trip fare.
- 70% of the trip fare will be transferred into the account of driver, 20% in the company account, and 10% in the government account in the form tax. Calculate and display the share of driver, company and government tax.

Display the following information to the user on console:

- Type of vehicle (e.g., Auto, Bike or a car i.e., Name of the vehicle)
- Base fare
- Distance charges
- Time charges
- Waiting Penalty
- Surge Charges
- Discount
- Trip fare
- Share of driver
- Share of company
- Tax

Important guidelines:

- **Learning is the main objective of this activity so do not try to copy the code. If you are facing any difficulty in problem understanding you can discuss with your T.A and I am also available in my office on Tuesday, Thursday, and Friday.**
- Write generic code that can be used to run on any input. Sample output is provided to demonstrate the working of the program. You can test the working of your programs on the given input data.
- Use meaningful variable names, indent your code properly and write proper comments
- **Submit only cpp files in the classroom.**
- Follow the naming convention (roll-number_question no) e.g., **22L-7542_q1**