PSCP Assignment-1 Section-C

Due date: 28/12/2020

1. Your library need your help. Given the expected and actual return dates for a library book, create a program that calculates the fine (if any). The fee structure is as follows:
    a. If the book is returned on or before the expected return date, no fine will be charged i.e. fine=0.
    b. If the book is returned after the expected return *day* but still within the same calendar month and year as the expected return date, fine= Rs. (15*number of days late)
    c. If the book is returned after the expected return *month* but still within the same calendar year as the expected return date, fine= Rs. (50*number of months late)
    d. If the book is returned after the calendar *year* in which it was expected, there is a fixed fine of Rs. 1000.

2. If you want to goto your house at Hyderabad, there are three options for you: Train, Bus, and Car.
   If you go by bus, you need to get down at 'Uppal' and from there you can either by auto or bike.

   If you go by car, you will directly reach your house.

   If you go by train, you need to go by cab/bike/auto. But if you use cab, after getting down once again you need to go by bike.

   Write a program to cover all the options ***nested switch.***

3. If you have two fractions, a/b and c/d, their sum can be obtained from the formula: for example, 1/4 plus 2/3 is (1/4)+(2/3) = 11/12 Write a program that encourages the user to enter two fractions and the display their sum in fractional form. The interaction with the user might look like this:
   Enter first fraction: 1 / 2, Enter second fraction: 2 / 5, sum = 9 / 10

4. Write a program to evaluate the fuel consumption of a car. The mileage at the start and end of the journey should be read, and also the fuel level in the tank at the start and end of the journey. Calculate fuel used, kilometers travelled, and hence the overall fuel consumption in kilometers travelled per liter of fuel (i.e. mileage).

5. Sridhar, the man who delivers eggs to my home every day, did not turn up one day. So when he came the next morning I demanded an explanation from him. He told me the following story: The previous morning when he just came out of the house carrying a basketful of eggs on his head to start his daily rounds and stepped on to the street, a car going at full speed brushed against him and knocked down his basket destroying all the eggs. The driver, however, a thorough gentleman (Mahesh) admitted his responsibility

and offered to compensate him for damages. But Sridhar could not remember the exact number of eggs he had, but he estimated the number between 50 to 100. He was also able to tell Mahesh that if the eggs were counted by 2's and 3's at a time, none would be left, but if counted by 5's at a time, 3 would remain, and that he sold the eggs 50 paise a piece. The Mahesh made some quick calculations and paid Sridhar adequately. How much did the Mahesh pay Sridhar? Write a program for this.

6. A passenger wants to travel through Indian railway for which he wants to book a ticket. Write a program to decide the fare of the passenger based on the following data. The category of railway passengers can be divided into Child (less than 5 years), Adult (5 to 59 years) and Senior citizen (60 years and more) based on their age. The program reads the age and the distance (kilometers) of travel from a source station to a destination station for the passenger as input. If the passenger is a Child, it need not pay any money to travel. If the person is Adult then he has to pay the FULL fare (50 paisa per kilometer). However, for the senior citizens the fare is 40% less than the Adults.
7. The table below shows the normal boiling points of several substances. Write a program that prompts the user for the observed boiling point of substance in ^{0}c and identifies the substance if the observed boiling point is within 5% of the expected boiling point. If the data input in more than 5% higher or lower than any of the boiling points in the table, the program should output the message "Unknown substance".

Substance	Normal boiling point(^{o}c)
Water	100
Gold	2660
Mercury	357
Copper	1187
Silver	2193

8. Write a program that that reads the following two parameters – (i) Type of the vehicle, *('M' or 'm' for motorbike, 'C' or 'c' for car, and 'B' or 'b' for Bus)*, and (ii) Number of hours that a vehicle spent in the parking lot. The program should compute the parking charge based on the following parking rates – Rs. 5, Rs. 10 and Rs. 50 per hour respectively for motorbike, car and bus.
9. There are three different faculty positions in an educational institute, namely, *Professor*, *Associate Professor* and *Assistant Professor*. The total number of faculties in the organization is 150. The salary structures for different faculty positions are different. A *Professor* gets Rs 40,000/- basic pay (per month) with 55% dearness allowance (DA), 30% house rent allowance (HRA) and 10% medical allowance (MA). An *Associate Professor* gets Rs 30,000/- basic pay (per month) with 50% DA, 25% HRA and 10% MA. An Assistant Professor gets Rs 20,000/- basic pay (per month) with 45% DA, 20% HRA and 10% MA. Furthermore, a lady faculty will get 5% travelling allowance. Write a program to display the gross salary (total salary) of each faculty in the institute. Use a switch statement to decide or select a given faculty position.

10. The National Earthquake information center has asked you to write a program implementing the following decision table to characterize an earth-quake base on its Richter scale number.

Richter Scale Number (n)	Characterization
$n < 5.0$	Little or no damage
$5.0 \leq n < 5.5$	Some damage
$5.5 \leq n < 6.5$	Serious damage: walls may crack or fall
$6.5 \leq n < 7.5$	Disaster; houses and buildings may collapse
Higher	Catastrophe: most buildings destroyed

Could you handle this problem with *switch* statement? If so, use a switch statement; if not explain why and write a program by using any of your approach.