Programming Fundamental

Assignment - 03

Instructions:

- It is individual assignment, so try to do it by yourself.
- Assignment should be in zip file named as RollNumber_Name_PF.zip and name of your file should be according to tasks given in this assignment.
- Assignment should be send on **bsef21pf@gmail.com** before deadline **Monday 14 February 2022, 11:59pm**. Late submissions will not be considered.
- Email subject must contain **PF_Assignment -03**.
- Feel free to ask any question.
- Total marks of assignment are 100, 10 each.

Task# 01:

Software Sales

A software company sells a package that retails for $99. Quantity discounts are given

according to the following table.

Quantity

Discount

10–19   20%

20–49   30%

50–99   40%

100 or more   50%

Write a program that asks for the number of units sold and computes the total cost of

the purchase.

Input Validation: Make sure the number of units is greater than 0.

Task# 02:

(Palindromes) A palindrome is a number or a text phrase that reads the same backward as forward. For example, each of the following five-digit integers is a palindrome: 12321, 55555, 45554 and 11611. Write a program that reads in a five-digit integer and determines whether it's a palindrome.

[*Hint:* Use the division and modulus operators to separate the number into its individual digits.]

Task# 03:

(Printing the Decimal Equivalent of a Binary Number) Input an integer containing only 0s

and 1s (i.e., a "binary" integer) and print its decimal equivalent. Use the modulus and division operators to pick off the "binary" number's digits one at a time from right to left. Much as in the decimal number system, where the rightmost digit has a positional value of 1, the next digit left has a positional value of 10, then 100, then 1000, and so on, in the binary number system the rightmost digit has a positional value of 1, the next digit left has a positional value of 2, then 4, then 8, and so on. Thus the decimal number 234 can be interpreted as2* 100 +3* 10 + 4 * 1. The decimal equivalent of binary 1101 is 1 * 1+0* 2+1* 4+1* 8 or 1 +0+ 4+8, or 13.

Task# 04:

The date June 10, 1960 is special because when it is written as 10/6/60, the month times the day equals the year. Design a program that asks the user to enter a month (in numeric form), a day, and a two digit year. The program should then determine whether the month times the day equals the year. If so, it should display a message saying the date is magic. Otherwise, it should display a message saying the date is not magic.

Task# 05:

Create a change-counting game that gets the user to enter the number of coins required to make exactly one dollar. The program should prompt the user to enter the number of pennies (1/100 dollars), nickels (1/20 dollars), dimes (1/10 dollars), and quarters (1/4 dollars). If the total value of the coins entered is equal to one dollar, the program should congratulate the user for winning the game. Otherwise, the program should display a message indicating whether the amount entered was more than or less than one dollar.

Task# 06:

Running the Race

Write a program that asks for the names of three runners and the time it took each of them to finish a race. The program should display who came in first, second, and third place. Input Validation: Only accept positive numbers for the times.

Task# 07:

A long-distance carrier charges the following rates for telephone calls:

Starting Time of Call	Rate per Minute
00:00–06:59	0.05
07:00–19:00	0.45
19:01–23:59	0.20

Write a program that asks for the starting time and the number of minutes of the call, and displays the charges. The program should ask for the time to be entered as a floatingpoint number in the form HH.MM. For example, 07:00 hours will be entered as 07.00, and 16:28 hours will be entered as 16.28.

Input Validation: The program should not accept times that are greater than 23:59. Also, no number whose last two digits are greater than 59 should be accepted.

Hint: Assuming num is a floating-point variable, the following expression will give you its fractional part: num – static_cast<int>(num)

Task# 08:
Mobile Service Provider

A mobile phone service provider has three different subscription packages for its customers:

Package A: For $39.99 per month 450 minutes are provided. Additional minutes are

$0.45 per minute.

Package B: For $59.99 per month 900 minutes are provided. Additional minutes are

$0.40 per minute.

Package C: For $69.99 per month unlimited minutes provided.

Write a program that calculates a customer's monthly bill. It should ask which package the customer has purchased and how many minutes were used. It should then display the total amount due.

Input Validation: Be sure the user only selects package A, B, or C

Task# 09:
A county collects property taxes on the assessment value of property, which is 60 percent of the property's actual value. If an acre of land is valued at $10,000, its assessment value is $6,000. The property tax is then 75¢ for each $100 of the assessment value. The tax for the acre assessed at $6,000 will be $45. Write a program that asks for the actual value of a piece of property, then displays the assessment value and property tax.

Task#10:
(Target-Heart-Rate Calculator)

While exercising, you can use a heart-rate monitor to see that your heart rate stays within a safe range suggested by your trainers and doctors. According to the American Heart Association (AHA), the formula for calculating your maximum heart rate in beats per minute is 220 minus your age in years. Your target heart rate is a range that's 50–85% of your maximum heart rate. [Note: These formulas are estimates provided by the AHA. Maximum and target heart rates may vary based on the health, fitness and gender of the individual. Always consult a physician or qualified health-care professional before beginning or modifying an exercise program.]

Create a program that reads the user's birthday and the current day (each consisting of the month, day and year). Your program should calculate and display the person's age (in years), the person's maximum heart rate and the person's target-heart-rate range.