PRE-RELEASE MATERIAL 2210/22 MJ-2020

VB Code TASK1, TASK2 & TASK3

Your preparation for the examination should include attempting the following practical tasks by **writing and testing a program or programs**.

A car park payment system allows customers to select the number of hours to leave their car in the car park. The customer will get a discount if they enter their frequent parking number correctly. The system calculates and displays the amount the customer must pay. The price of parking, the number of hours the customer can enter, and any discount depend upon the day of the week and the arrival time. The number of hours entered is a whole number. The price per hour is calculated using the price in force at the arrival time. No parking is allowed between Midnight and 08:00.

Day of the week	Arrival time			
	From 08:00 to 15:59		From 16:00 to Midnight	
	Max stay in hours	Price per hour	Hours	Price
Sunday	8	2.00	Up to Midnight	2.00
Monday	2	10.00	Up to Midnight	2.00
Tuesday	2	10.00	Up to Midnight	2.00
Wednesday	2	10.00	Up to Midnight	2.00
Thursday	2	10.00	Up to Midnight	2.00
Friday	2	10.00	Up to Midnight	2.00
Saturday	4	3.00	Up to Midnight	2.00

A frequent parking number can be entered for discounted parking. This number consists of **4 digits and a check digit that is calculated using a modulo 11 check digit calculation**. A discount of 50% is available for arrival times from 16:00 to Midnight; the discount is 10% at all other arrival times.

Write and test a program or programs to simulate the car park payment system.

Your program or programs must include appropriate prompts for the entry of data; data must be validated on entry.
Error messages and other output need to be set out clearly and understandably.
All variables, constants and other identifiers must have meaningful names.

You will need to complete these **three** tasks. Each task must be fully tested.

Task 1 – Calculating the price to park.

A customer inputs the day, the hour of arrival excluding minutes (for example 15:45 would be 15), the number of hours to leave their car, and a frequent parking number if available. If the frequent parking number has an incorrect check digit, then no discount can be applied. The

price to park, based on the day, the hour of arrival, the number of hours of parking required and any discount available, is calculated and displayed.

Task 2 – Keeping a total of the payments.

Extend **Task 1** to keep a daily total of payments made for parking. The daily total is zeroed at the start of the day. For the simulation, each customer inputs the amount paid, this must be greater than or equal to the amount displayed. There is no change given so the amount input may exceed the amount displayed. Each customer payment is added to the daily total, and this total is displayed at the end of the day.

Task 3 – Making payments fairer.

Customers have complained that sometimes they are being charged too much if they arrive before 16:00 and depart after 16:00. Extend **Task 1** to calculate the price before 16:00, then add the evening charge. For example, a customer arriving at 14:45 on a Sunday and parking for five hours was previously charged 10.00 and would now be charged 6.00

Pre Release solution Complete (Visual Basic - Code)

```vb
Module Module1
Sub main()
'TASK:1 //Parking Number
  Dim maxparking() As Integer = {8, 2, 2, 2, 2, 2, 4}
  Dim hourprice() As Integer = {2, 10, 10, 10, 10, 10, 3}
  Dim parkingday As Integer
  Dim arrivaltime, parkinghours, parkingprice, frequentparknum As Integer
  Dim discount, totalpayable As Double
  Dim choice As Boolean
  Dim checkdigit, digit1, digit2, digit3, digit4, digit5 As Integer
  Dim dailytotal As Integer = 0 'Daily total is zero at the start of the day

1: 'Step:1 to return to Task1 from Task2 for next customer
   Console.WriteLine("Welcome to Parking System")
  Do
    Console.WriteLine("sunday=0, Monday =1, Tuesday=2, Wednesday=3, Thursday =4,
Friday=5, Saturday=6")
    Console.WriteLine("INPUT DAY NUMBER")
    parkingday = Console.ReadLine()
  Loop Until parkingday >= 0 And parkingday <= 6
  Do
    Console.WriteLine("Allowed time is 8:00 TO 24:00, No Parking from 24 TO 7")
    arrivaltime = Console.ReadLine()
  Loop Until arrivaltime >= 8 And arrivaltime <= 24
  Do
    Console.WriteLine("Sunday Max: 8 hours, Saturday Max 4 Hours, Weekdays Max 2hours")
    Console.WriteLine("input Parking hours")
    parkinghours = Console.ReadLine()
  Loop Until parkinghours >= 0 And parkinghours <= maxparking(parkingday)
  If arrivaltime <= 15 Then
     parkingprice = parkinghours * hourprice(parkingday)
        ElseIf arrivaltime >= 16 Then
                parkingprice = 2
  End If
Console.WriteLine("Do you have frequent parking number? True for yes, False for No")
choice = Console.ReadLine()
If choice = True Then
    Console.WriteLine("Enter your 5 digit frequent Parking number,  one digit at a time")
    digit1 = Console.ReadLine()
    Console.WriteLine("digit 2= ?")
    digit2 = Console.ReadLine()
    Console.WriteLine("digit 3= ?")
    digit3 = Console.ReadLine()
    Console.WriteLine("digit 4= ?")
    digit4 = Console.ReadLine()
    Console.WriteLine("last digit checkDigit= ?")
    digit5 = Console.ReadLine()
    frequentparknum = (5 * digit1) + (4 * digit2) + (3 * digit3) + (2 * digit4)
    checkdigit = 11 - (frequentparknum Mod 11)
    If checkdigit = digit5 Then
      If arrivaltime >= 16 Then
        discount = parkingprice / 2 '50% discount applied
      Else
        discount = (parkingprice / 100) * 10 '10% discount
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            End If
         Else
            Console.WriteLine("check digit did not verify")
            discount = 0
         End If
      Else
         discount = 0
      End If
      totalpayable = parkingprice - discount
      Console.Clear()
      Console.WriteLine("Parking day selected is : " & parkingday)
      Console.WriteLine("Arrival time in Parking : " & arrivaltime)
      Console.WriteLine("total number of hours to leave car in parking : " & parkinghours)
      Console.WriteLine(" Total Price of Parking is: = " & parkingprice)
      Console.WriteLine("frequent parking num = " & digit1 & digit2 & digit3 & digit4 & digit5)
      Console.WriteLine("Checkdigit: " & checkdigit)
      Console.WriteLine("Discount : " & discount)
      Console.WriteLine("Total amount to be paid =  " & totalpayable)
      'Task2 (SIMULATION OF PARKING SYSTEM TO CALCULATE DAILY TOTAL AT DAY-END)
      Dim parkingclosed As Boolean
      Dim customeramount As Integer
       Do
         parkingclosed = False
         Console.WriteLine("Please Enter the amount you want to pay")
         customeramount = Console.ReadLine()
            While customeramount < totalpayable
                  Console.WriteLine("Amount you paid is less than parking fee, Enter again")
                  customeramount = Console.ReadLine()
            End While
         dailytotal = dailytotal + customeramount
         Console.WriteLine("Total Sale till now is : " & dailytotal)
         Console.WriteLine("PARKING CLOSED ? TRUE for Yes, FALSE to Input Next Custoner")
         parkingclosed = Console.ReadLine()
            If parkingclosed = False Then
               GoTo 1
            End If
      Loop Until parkingclosed = True
      Console.WriteLine("Total Complete Day Amount = " & dailytotal)
      Console.ReadKey()

      'Task3 (MAKING PARKING SYSTEM FAIR)

      Dim departuretime, departure, newprice As Integer
      Dim pricebefore16, priceafter16 As Integer
      Console.WriteLine("please Enter your departure time")
      departuretime = Console.ReadLine()
      departure = arrivaltime + parkinghours
        If departuretime <= 16 Then
           pricebefore16 = parkinghours * hourprice(parkingday)
           priceafter16 = 0
        Else
           pricebefore16 = (16 - arrivaltime) * hourprice(parkingday)
           priceafter16 = 2
        End If
      newprice = pricebefore16 + priceafter16
      Console.WriteLine("fair Payment: " & newprice)
      Console.ReadLine()
```