PRE-RELEASE MATERIAL 2210/22 MJ-2021

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

An electric mountain railway makes four return trips every day. In each trip the train goes up the mountain and back down. The train leaves from the foot of the mountain at 09:00, 11:00, 13:00 and 15:00. The train returns from the top of the mountain at 10:00, 12:00, 14:00 and 16:00. Each train has six coaches with eighty seats available in each coach. Passengers can only purchase a return ticket; all tickets must be purchased on the day of travel. The cost is $25 for the journey up and $25 for the journey down. Groups of between ten and eighty passengers inclusive get a free ticket for every tenth passenger, provided they all travel together (every tenth passenger travels free). Passengers must book their return train journey, as well as the departure train journey, when they purchase their ticket.

Passengers can return on the next train down the mountain or a later train. The last train from the top of the mountain has two extra coaches on it.

The train times are displayed on a large screen, together with the number of tickets still available for each train. Every time a ticket is booked the display is updated. When a train is full, the word 'Closed' is displayed instead of the number of tickets available.

Write and test a program or programs for the electric mountain railway.

- 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 – Start of the day.
Write a program to set up the screen display for the start of the day. Initialise suitable data structure(s) to total passengers for each train journey and total the money taken for each train journey. Each train journey must be totalled separately. There are four journeys up and four journeys down every day.

Task 2 – Purchasing tickets.
Tickets can be purchased for a single passenger or a group. When making a purchase, check that the number of tickets for the required train journeys up and down the mountain is available. If the tickets are available, calculate the total price including any group discount. Update the screen display and the data for the totals.

Task 3 – End of the day.
Display the number of passengers that travelled on each train journey and the total money taken for each train journey. Calculate and display the total number of passengers and the total amount of money taken for the day. Find and display the train journey with the most passengers that day.

Pre Release solution Complete VB-Code

```vb
Sub Main()
 'TASK 1

 Console.WriteLine("PRE-RELEASE MJ2021 SOLUTION IN VB")
 Const OneWayTicket = 25

     Dim TrainTimeUp() As String = {"9:00", "11:00", "13:00", "15:00"}
     Dim totalupseats() = {480, 480, 480, 480}
     Dim occupiedUpseat() = {0, 0, 0, 0}
     Dim UPtrainmoney() = {0, 0, 0, 0}

     Dim TrainTimeDown() As String = {"10:00", "12:00", "14:00", "16:00"}
     Dim totaldownseats() = {480, 480, 480, 640}
     Dim occupiedDownseat() = {0, 0, 0, 0}
     Dim DOWNtrainmoney() = {0, 0, 0, 0}
     Dim MaxPassangerTrain() = {0, 0, 0, 0}
     Dim choice As Boolean
     Dim numofpassanger, UpTrip, DownTrip, cost, discountedCost As Integer
     Dim TwoWayTickets As Integer

     Dim totalpassangers, totalamount As Integer 'For TASK3

     Console.WriteLine("Welcome to TRAIN JOURNEY Display Screen")
     For count = 0 To 3
         Console.WriteLine("Train Num:  " & count & "  Train Time Up : " &
TrainTimeUp(count) & " Total seats Up : " & totalupseats(count) & " Ocuupied Seats : " &
occupiedUpseat(count))
         Console.WriteLine("UpTrain Money = " & UPtrainmoney(count))
         Console.WriteLine("Train Num:  " & count & "  Train Time Down : " &
TrainTimeDown(count) & " Total seats Down : " & totaldownseats(count) & " Ocuupied Seats
: " & occupiedDownseat(count))
         Console.WriteLine("DownTrain Money = " & DOWNtrainmoney(count))
         Console.WriteLine("-------------------------------------")
     Next

     'Task 2
     Console.WriteLine("Do you want to Buy Tickets? True for yes and False for no")
     choice = Console.ReadLine()


     While choice <> False

     Console.WriteLine("Enter number of passangers for trip")
         numofpassanger = Console.ReadLine()

         totalpassangers = totalpassangers + numofpassanger

         Console.WriteLine("Enter Train to Journey Up [0,1,2,3] ")
         UpTrip = Console.ReadLine()
         occupiedUpseat(UpTrip) = occupiedUpseat(UpTrip) + numofpassanger
         totalupseats(UpTrip) = totalupseats(UpTrip) - numofpassanger

         Console.WriteLine("Enter Train number to Journey DOWN [0,1,2,3] ")
```

```vbnet
            DownTrip = Console.ReadLine()
            occupiedDownseat(DownTrip) = occupiedDownseat(DownTrip) + numofpassanger
            totaldownseats(DownTrip) = totaldownseats(DownTrip) - numofpassanger

            cost = numofpassanger * OneWayTicket

            discountedCost = cost - (OneWayTicket * (numofpassanger \ 10)) 'Integer
Division for discount of every 10th Passanger
            TwoWayTickets = discountedCost * 2 'You have to buy ticket for UpTrip and
DownTRin
            UPtrainmoney(UpTrip) = UPtrainmoney(UpTrip) + discountedCost
            DOWNtrainmoney(DownTrip) = DOWNtrainmoney(DownTrip) + discountedCost

        totalamount = totalamount + UPtrainmoney(UpTrip) + DOWNtrainmoney(DownTrip)
'For Task3
            Console.Clear()

  For count = 0 To 3
    Console.WriteLine("Train Num:  " & count & "  Train Time Up:" & TrainTimeUp(count) & "
Total seats Up:" & totalupseats(count) & " Ocuupied Seats: " & occupiedUpseat(count))
    Console.WriteLine("UpTrain Money = " & UPtrainmoney(count))
    Console.WriteLine("Train Num:  " & count & "  Train Time Down:" & TrainTimeDown(count)
& " Total seats Down:" & totaldownseats(count) & " Ocuupied Seats: " &
occupiedDownseat(count))
    Console.WriteLine("DownTrain Money = " & DOWNtrainmoney(count))

      If totalupseats(count) = 0 Then
        Console.WriteLine(TrainTimeUp(count) & " : Train is FULL : Booking CLOSED")
      Else
        Console.WriteLine(TrainTimeUp(count) & " : Seats available : Booking OPEN")
      End If
      Console.WriteLine("-------------------------------------")

      If totaldownseats(count) = 0 Then
        Console.WriteLine(TrainTimeDown(count) & " : Train is FULL : Booking CLOSED")
      Else
        Console.WriteLine(TrainTimeDown(count) & " : Seats available : Booking OPEN")
      End If
        Console.WriteLine("-------------------------------------")

  Next
    Console.WriteLine("Do you want to buy more Tickets? True for yes and False for no")
    choice = Console.ReadLine()

End While

        'Task 3
        Dim Maxtrainup As String
        Dim Maxtraindown As String
        Console.Clear
        Console.WriteLine(" ------ END OF THE DAY ----------")
        For count = 0 To 3
            If occupiedUpseat(count) > MaxPassangerTrain(count) Then
                MaxPassangerTrain(count) = MaxPassangerTrain(count) +
occupiedUpseat(count)
                Maxtrainup = TrainTimeUp(count)
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            ElseIf occupiedDownseat(count) > MaxPassangerTrain(count) Then
                MaxPassangerTrain(count) = MaxPassangerTrain(count) +
occupiedDownseat(count)
                Maxtraindown = TrainTimeDown(count)

            End If

            Console.WriteLine("--------------------------------------")
            Console.WriteLine("Train Num:  " & count & "  Train Time Up:" &
TrainTimeUp(count) & " Total seats Up:" & totalupseats(count) & " Ocuupied Seats: " &
occupiedUpseat(count))
            Console.WriteLine("UpTrain Money = " & UPtrainmoney(count))
            Console.WriteLine("Train Num:  " & count & "  Train Time Down:" &
TrainTimeDown(count) & " Total seats Down:" & totaldownseats(count) & " Ocuupied Seats: "
& occupiedDownseat(count))
            Console.WriteLine("DownTrain Money = " & DOWNtrainmoney(count))
            Console.WriteLine("--------------------------------------")

        Next
        Console.WriteLine("Total Money Earned TODAY: " & totalamount)
        Console.WriteLine("Total Passangers travelled TODAY: " & totalpassangers)
        Console.WriteLine("Maxtrain Passanger train Upwards = " & Maxtrainup)
        Console.WriteLine("Maxtrain Passanger train Downwards = " & Maxtraindown)
        Console.ReadKey()
    End Sub
End Module
```