// Paper 2 Problem-solving and Programming - PRE-RELEASE MATERIAL - 0478/22 - MAY/JUNE 2021

// TASK 1 VARIABLE DECLARATIONS

DECLARE UpTime : ARRAY[0:3] OF STRING

DECLARE UpSeats : ARRAY[0:3] OF INTEGER

DECLARE UpPassengers : ARRAY[0:3] OF INTEGER

DECLARE UpMoneyTotal : ARRAY[0:3] OF REAL

DECLARE DownTime : ARRAY[0:3] OF STRING

DECLARE DownSeats : ARRAY[0:3] OF INTEGER

DECLARE DownPassengers : ARRAY[0:3] OF INTEGER

DECLARE DownMoneyTotal : ARRAY[0:3] OF REAL

UpTime <- {"09:00", "11:00", "13:00", "15:00"}

UpSeats <- {480, 480, 480, 480}

UpPassengers <- {0, 0, 0, 0}

UpMoneyTotal <- {0.0, 0.0, 0.0, 0.0}

DownTime <- {"10:00", "12:00", "14:00", "16:00"}

DownSeats <- {480, 480, 480, 640}

DownPassengers <- {0, 0, 0, 0}

DownMoneyTotal <- {0.0, 0.0, 0.0, 0.0}

DECLARE index : INTEGER //for Loops

// TASK 1 ALGORITHM

PRINT ">>>>> TRAIN JOURNEY DISPLAY <<<<<"

FOR index <- 0 TO 3

IF UpSeats[index] != 0

THEN

PRINT ("Train No: ", index, "| Train Departure Hour: ", UpTime[index], "| Remaining Tickets: ", UpSeats[index])

ELSE

PRINT ("Train No: ", index, "| Train Departure Hour: ", UpTime[index], "| Closed!")

ENDIF

IF DownSeats[index] != 0

THEN

PRINT ("Train No: ", index, "| Train Return Hour: ", DownTime[index], "| Remaining Tickets: ", DownSeats[index])

ELSE

PRINT ("Train No: ", index, "| Train Return Hour: ", DownTime[index], "| Closed!")

ENDIF

NEXT index

// TASK 2 VARIABLE DECLARATIONS

DECLARE FreeTickets <- 0 : INTEGER

DECLARE CONSTANT OneWayTicket <- 25.0 : REAL

DECLARE OneWayCost <- 0.0 : REAL

DECLARE choice : BOOLEAN

DECLARE NumOfPassengers, UpTrip, DownTrip, index : INTEGER

// TASK 2 ALGORITHM

PRINT "Do you want to buy ticket(s)? 'True' for yes and 'False' for no"

INPUT choice

WHILE choice != True AND choice != False DO

PRINT "Enter 'True' for yes and 'False' for no: "

INPUT choice

ENDWHILE

WHILE choice = True DO

PRINT "Enter Train number corresponding to your departure hour: "

INPUT UpTrip

WHILE UpTrip < 0 AND UpTrip > 3 DO

PRINT "Error! Enter train number from (0, 1, 2, 3): "

INPUT UpTrip

ENDWHILE

PRINT "----- Return Hours Available -----"

FOR index <- UpTrip TO 3

PRINT "Train No:", index, " | Return Hour:", DownTime[index], " | Remaining Tickets:", DownSeats[index],

NEXT index

PRINT "Enter Train number corresponding to your Return hour: "

INPUT DownTrip

WHILE DownTrip < UpTrip OR DownTrip > 3:

PRINT "Error! Enter Train number from the given list above: "

INPUT DownTrip

ENDWHILE

PRINT "Enter number of passengers for trip: "

INPUT NumOfPassengers

WHILE NumOfPassengers <= 0:

PRINT "Error! Enter number greater than 0: "

INPUT NumOfPassengers

ENDWHILE

IF NumOfPassengers > UpSeat[UpTrip] OR NumOfPassengers > DownSeats[DownTrip]

THEN

PRINT "Seats not available for chosen hours"

PRINT "Please check the display below for available Seats =>"

ELSE

PRINT "/// SEATS BOOKED ///"

IF NumOfPassengers >= 10 and NumOfPassengers <= 80

THEN

FreeTickets <- NumOfPassengers DIV 10 // DIV is INTEGER DIVISION

ELSE

FreeTickets <- 0

ENDIF

OneWayCost <- (NumOfPassengers - FreeTickets) \* OneWayTicket

UpPassengers[UpTrip] <- UpPassengers[UpTrip] + NumOfPassengers

UpSeats[UpTrip] <- UpSeats[UpTrip] - NumOfPassengers

UpMoneyTotal[UpTrip] <- UpMoneyTotal[UpTrip] + OneWayCost

DownPassengers[DownTrip] <- DownPassengers[DownTrip] + NumOfPassengers

DownSeats[DownTrip] <- DownSeats[DownTrip] - NumOfPassengers

DownMoneyTotal[DownTrip] <- DownMoneyTotal[DownTrip] + OneWayCost

ENDIF

PRINT ">>>>> TRAIN JOURNEY DISPLAY <<<<<"

FOR index <- 0 TO 3

IF UpSeats[index] != 0

THEN

PRINT ("Train No: ", index, "| Train Departure Hour: ", UpTime[index], "| Remaining Tickets: ", UpSeats[index])

ELSE

PRINT ("Train No: ", index, "| Train Departure Hour: ", UpTime[index], "| Closed!")

ENDIF

IF DownSeats[index] != 0

THEN

PRINT ("Train No: ", index, "| Train Return Hour: ", DownTime[index], "| Remaining Tickets: ", DownSeats[index])

ELSE

PRINT ("Train No: ", index, "| Train Return Hour: ", DownTime[index], "| Closed!")

ENDIF

NEXT index

PRINT "Do you want to buy ticket(s)? 'True' for yes and 'False' for no"

INPUT choice

WHILE choice != True AND choice != False DO

PRINT "Enter 'True' for yes and 'False' for no: "

INPUT choice

ENDWHILE

ENDWHILE

// TASK 3 VARIABLE DECLARATIONS

DECLARE TotalAmount <- 0.0 : REAL

DECLARE TotalPassengers, MostPassengers <- 0 : REAL

DECLARE MaxTrain : STRING

DECLARE index : INTEGER

// TASK 3 ALGORITHM

PRINT "----- END OF THE DAY -----"

FOR index <- 0 TO 3

PRINT ("Train No: ", index, "| Train Departure Hour: ", UpTime[index], "| Number of passengers: ", UpPassengers[index],

"| Total money: ", UpMoneyTotal[index])

PRINT ("Train No: ", index, "| Train Return Hour: ", DownTime[index], "| Number of passengers: ", DownPassengers[index],

"| Total money: ", DownMoneyTotal[index])

PRINT "" // EMPTY LINE

NEXT index

FOR index <- 0 TO 3

TotalPassengers <- TotalPassengers + UpPassengers[index]

TotalAmount <- TotalAmount + (UpMoneyTotal[index] \* 2)

ENDIF

FOR index <- 0 TO 3

IF UpPassengers[index] > MostPassengers

THEN

MostPassengers <- UpPassengers[index]

MaxTrain <- UpTime[index]

ENDIF

IF DownPassengers[index] > MostPassengers

THEN

MostPassengers <- DownPassengers[index]

MaxTrain <- DownTime[index]

ENDIF

NEXT index

PRINT "Total money earned today:", TotalAmount

PRINT "Total passengers travelled today:", TotalPassengers

PRINT "The train journey with the highest number of passengers today:", MaxTrain