

In [ ]: Theme Park is one of most attractive places to be visited especially during the school holiday in Malaysia. Desa Park is a theme park that will open early next year in Selangor. Desa Park offers many water activities, indoor games and rides in which all of them are all scattered in different locations in the park. In addition, the ticket fee is charged at each activity, games or rides chooses by visitors. To streamline the Desa Park management and operation process, JustCode Software House has been appointed to provide an application that support the ticket purchasing process and information of the theme park. As a programmer at JustCode Software House, you need to develop an application that has the following functionalities so that the visitors can planned their activities well. The functionalities are:

- Store the information of ticket fee for each activity, games or ride using linked list and calculate the total payment for tickets
- Calculate the distance travelled by a visitor using graph. Visitors need to mention the sequence of locations to be visited in the theme park.

Task:

- Provide overview and objective of your application development.
- Draw a visual map of theme park with locations of activities and distances among all the locations using graph.
- Produce adjacency matrix and adjacency list that represents locations and distances for a graph in Task 1.
- Develop an application that fulfill the requirements below:
  - Implement linked list to calculate the tickets fee and display the fee for each location and total ticket fee.
  - Implement graph that represent locations (vertices) and distances (edges) that map your design in Task 1 and Task 2.
- Apply good programming practices in terms of:
  - Flow of the system (appropriate menu)
  - Comments
  - Output layout

In [ ]: ##### *Linked List Process*

```
class Vertex:
    def __init__(self,initdata):
        self.data = initdata
        self.next = None

    def getData(self):
        return self.data

    def getNext(self):
        return self.next

    def setData(self,newdata):
        self.data = newdata

    def setNext(self,newnext):
        self.next = newnext

class List:

    def __init__(self):
        self.head = None

    def empty(self):
        return self.head == None

    def add(self,item):
        temp = Vertex(item)
        temp.setNext(self.head)
        self.head = temp

    def size(self):
        current = self.head
        count = 0

        while current != None:
            count = count + 1
            current = current.getNext()

        return count
```

```
def search(self,item):
    current = self.head
    found = False

    while current != None and not found:
        if current.getData() == item:
            found = True
        else:
            current = current.getNext()

    return found

def remove(self,item):
    current = self.head
    previous = None
    found = False

    while not found:
        if current.getData() == item:
            found = True
        else:
            previous = current
            current = current.getNext()

    if previous == None:
        self.head = current.getNext()
    else:
        previous.setNext(current.getNext())

def print(self):
    current = self.head

    while current != None:
        print(current.getData())
        current = current.getNext()

#### Graph Process Code

def add_location(L):
    global location_count
    location_count = location_count + 1
    location.append(L)
    for x in graph:
```

```
x.append(0)

temp = []
for y in range(location_count):
    temp.append(0)
graph.append(temp)

def add_distance(L1,L2,distance):
    index1 = location.index(L1)
    index2 = location.index(L2)
    graph[index1][index2] = distance
    graph[index2][index1] = distance

def print_graph():
    for i in range(location_count):
        for j in range(location_count):
            print(format(graph[i][j], "<3"), end = " ")
        print()

def find_total_distance(L1,L2):
    return int(graph[L1][L2])

def find_distance(D):
    pos = 0

    while pos < len(location):
        if location[pos] == D:
            index = pos
            pos = pos + 1

    return index

# declare to start the program
print("Type 'start' to begin")
answer = input(":")
print()

#Looping for menu
menu = 'y'

# Declare Linked List
namelist = List()
totalprice_list = List()
```

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# Main Program (Looping)
if answer == 'start':
    while menu == 'y':

        # appropriate greetings
        # Main Menu
        print("*****")
        print("◡☆.◡ .:*◡◡◡◡☆.◡.\033[1m WELOCOME TO DESA THEME PARK◡◡☆.◡ .:*◡◡◡◡☆.◡.:* ")
        print("*****")
        print()
        print("HELLO WHAT CAN WE HELP YOU TODAY?")
        print()
        print("\u2764\uFE0F", "MENU", "\u2764\uFE0F")
        print ("\n1.) PURCHASE TICKETS \n2.) CHECK CUSTOMER'S NAME \n3.) DISTANCE TRAVEL \n4.) EXIT ")
        print()
        print ("*****")

        print()

        # From User Input
        answer = input("Your Options From Menu?(number): ")
        print()

        # User Choose option 1
        if answer == '1':
            print("_____")
            print("◡◡◡◡. TICKETS PURCHASE SECTION◡◡◡◡.")
            print("_____")
            print()

            # Collection of Variable
            other_user = 'y'
            while other_user == 'y':
                game_package = 'y'
                totalprice = 0

                print()

                # User Input Name
                name = input("Please Enter Your Name: ")

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# User input name added into the list
namelist.add(name)

print()

# User Input Age
age = int(input("Please Enter Your Age: "))

print()

#Kids Price Menu
if age <= 12:
    # Looping for kids game options
    while game_package == 'y':
        print("Hello",name,"!", "Please Choose Your Game Tickets ")
        print("----- KIDS PACKAGE ----- ")
        print()
        print("      NAME                                PACKAGE                                PRICE")
        print()
        print("iMagination 3D Theatre                    A                                RM3.00/each")
        print("DESA Wave Pool                            B                                RM2.00/each")
        print("Dragon Coaster Ride                       C                                RM5.10/each")
        print("Zombie House ESCAPE!                     D                                RM4.00/each")
        print("Splash 'N' Swirl Safari                   E                                RM2.50/each")
        print("VR: Shoot That ENEMY!                    F                                RM5.30/each")
        print("MINI Zoo Tour                             G                                RM1.60/each")
        print("Lost Kingdom Ride                         H                                RM3.50/each")
        print()

        # user Input : Package Selection
        package = input("Choose Your Package: ")
        package = package.capitalize()
        print()

        # Price & total Calculation for each package
        if package == 'A':
            qty = int(input("Quantity of Tickets?: "))
            price = 3 * qty
            totalprice = totalprice + price
            print("'iMagination 3D Theatre' Has Added To Cart")
            print("-----")
            print("Price Package A: RM",price)
            print("Total Current Price: RM",totalprice)

```

```
print("_____")
print()

elif package == 'B':
    qty = int(input("Quantity of Tickets?: "))
    price = 2 * qty
    totalprice = totalprice + price
    print("'DESA Wave Pool' Has Added To Cart!")
    print("_____")
    print("Price Package B: RM",price)
    print("Total Current Price: RM",totalprice)
    print("_____")
    print()

elif package == 'C':
    qty = int(input("Quantity of Tickets?: "))
    price = 5.10 * qty
    totalprice = totalprice + price
    print("'Dragon Coaster Ride'Has Added To Cart!")
    print("_____")
    print("Price Package C: RM",price)
    print("Total Current Price: RM",totalprice)
    print("_____")
    print()

elif package == 'D':
    qty = int(input("Quantity of Tickets?: "))
    price = 4 * qty
    totalprice = totalprice + price
    print("'Zombie House ESCAPE!'Has Added To Cart!")
    print("_____")
    print("Price of Package D: RM",price)
    print("Total Current price: RM",totalprice)
    print("_____")
    print()

elif package == 'E':
    qty = int(input("Quantity of Tickets?: "))
    price = 2.50 * qty
    totalprice = totalprice + price
    print("'Splash 'N' Swirl Safari' Has Added To Cart!")
    print("_____")
    print("Price of Package E: RM",price)
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print("Total Current Price: RM",totalprice)
print("_____")
print()

elif package == 'F':
    qty = int(input("Quantity of Tickets?: "))
    price = 5.30 * qty
    totalprice = totalprice + price
    print("'VR:Shoot That ENEMY!'Has Added To Cart!")
    print("_____")
    print("Price of Package F: RM",price)
    print("Total Current Payment: RM",totalprice)
    print("_____")
    print()

elif package == 'G':
    qty = int(input("Quantity of Tickets?: "))
    price = 1.60 * qty
    totalprice = totalprice + 1.60
    print("'MINI Zoo Tour' Has Added To Cart!")
    print("_____")
    print("Price: RM",price)
    print("Total payment: RM",totalprice)
    print("_____")
    print()

elif package == 'H':
    qty = int(input("Quantity of Tickets?: "))
    price = 3.50 * qty
    totalprice = totalprice + price
    print("'Lost Kingdom Ride' Has Added To Cart!")
    print("_____")
    print("Price of package H: RM",price)
    print("Total Current Price: RM",totalprice)
    print("_____")
    print()

else:
    print("Invalid Package! Try again. ")
    print()

# Looping For Other Package Selection For Kids
print()
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game_package = input("Add More Another Package?(y/n): ")
print()

# Add Data TotalPrice Into List
totalprice_list.add(totalprice)

else:
    # Looping for Adult Package
    while game_package == 'y':
        print("Hello",name,"!", "Please Choose Your Game Tickets ")
        print("_____ ADULT PACKAGE _____ ")
        print()
        print("    NAME                PACKAGE                PRICE")
        print()
        print("iMagination 3D Theatre      A                RM5.00/each")
        print("DESA Wave Pool             B                RM4.75/each")
        print("Dragon Coaster Ride        C                RM8.10/each")
        print("Zombie House ESCAPE!       D                RM5.30/each")
        print("Splash 'N' Swirl Safari    E                RM7.45/each")
        print("VR: Shoot That ENEMY!      F                RM10.31/each")
        print("MINI Zoo Tour              G                RM3.65/each")
        print("Lost Kingdom Ride          H                RM6.50/each")
        print()

        #user input for adult package
        package = input("Choose Your Package: ")
        package = package.capitalize()
        print()

        # Activity calculation
        if package == 'A':
            qty = int(input("How Many Tickets?: "))
            price = 5 * qty
            totalprice = totalprice + price
            print("'iMagination 3D Theatre' Has Added To Cart!")
            print("_____")
            print("Price of Package A: RM", price)
            print("Total Current Price: RM",totalprice)
            print("_____")
            print()

            elif package == 'B':
                qty = int(input("How Many Tickets?: "))

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price = 4.75 * qty
totalprice = totalprice + price
print("'DESA Wave Pool' Has Added To Cart!")
print("_____")
print("Price of Package B: RM",price)
print("Total Current Price: RM",totalprice)
print("_____")
print()

elif package == 'C':
    qty = int(input("Quantity of Tickets?: "))
    price = 8.10 * qty
    totalprice = totalprice + price
    print("'Dragon Coaster Ride' Has Added To Cart!")
    print("_____")
    print("Total Price Package C: RM",price)
    print("Total Current Price: RM",totalprice)
    print("_____")
    print()

elif package == 'D':
    qty = int(input("How Many Tickets?: "))
    price = 5.30 * qty
    totalprice = totalprice + price
    print("'Zombie House ESCAPE!'Has Added To Cart! ")
    print("_____")
    print("Total Price Package D: RM",price)
    print("Total Current Price: RM",totalprice)
    print("_____")
    print()

elif package == 'E':
    qty = int(input("How Many Tickets?: "))
    price = 7.45 * qty
    totalprice = totalprice + price
    print("'Splash 'N' Swirl' Has Added To Cart! ")
    print("_____")
    print("Total Price Package E: RM",price)
    print("Total Current Price: RM",totalprice)
    print("_____")
    print()

elif package == 'F':
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qty = int(input("How Many Tickets?: "))
price = 10.31 * qty
totalprice = totalprice + price
print("'VR:Shoot That ENEMY!' Has Added To Cart! ")
print("_____")
print("Total Price Package F: RM",price)
print("Total Current Price: RM",totalprice)
print("_____")
print()

elif package == 'G':
    qty = int(input("How Many Tickets?: "))
    price = 3.65 * qty
    totalprice = totalprice + price
    print("'MINI Zoo Tour' Has Added To Cart! ")
    print("_____")
    print("Total Price Package G: RM",price)
    print("Total Current Price: RM",totalprice)
    print("_____")
    print()

elif package == 'H':
    qty = int(input("How Many Tickets?: "))
    price = 6.50 * qty
    totalprice = totalprice + price
    print("'Lost Kingdom Ride' Has Added To Cart! ")
    print("_____")
    print("Total Price Package H: RM",price)
    print("Total Current Price: RM",totalprice)
    print("_____")
    print()

else:
    # warning if wrong input
    print("Invalid Package!Please try again.")
    print()

# Looping for other package selection (adult)
print()
game_package = input("Add More Another Package?(y/n): ")
print()

# Adding data into list

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totalprice_list.add(totalprice)

# Pass to other user selection
print()
other_user = input(" Next Person?(y/n): ")
print()

# Printing List for customer's name
print("_____")
print("LIST OF CUSTOMER'S NAME")
print("_____")
namelist.print()

print()

#printing List for total payment
print("_____")
print("TOTAL PAYMENT IN LIST")
print("_____")
totalprice_list.print()

print()

#size of List customer
print("Total Customer: ", namelist.size())
print()

print()

menu = input("Go Back To Main Menu?(y/n): ")
print()

elif answer == '2':

    print("_____")
    print("。 。 。 CUSTOMER'S NAME CHECKING IN TICKET PAYMENT LIST 。 。 。")
    print("_____")

    respond = input(" Search For Customer Name?(y/n): ")
    while respond != 'n':
        print()
        name = input("Enter The Search Name: ")
```

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found = namelist.search(name)
if found:
    print(name, " Is Existed In Ticket Payment List\n")
else:
    print(name, " Is NOT Existed in Ticket Payment List\n")
    print()

respond = input("Continue To Search Customer Name?(y/n): ")

menu = input("Go Back To Main Menu?(y/n): ")
print()

#option option 3
elif answer == '3':
    print("_____")
    print(" · ° · ° · DISTANCE TRAVELED SECTION · ° · ° · ")
    print("_____")
    print()

    # Location List, graph list and location count
    location = []
    graph = []
    location_count = 0

    # Adding data into Location List
    add_location("A")
    add_location("B")
    add_location("C")
    add_location("D")
    add_location("E")
    add_location("F")
    add_location("G")
    add_location("H")

    # Weight and Direction for Location A - (iMagination 3D Theatre)
    add_distance("A", "C", 500)
    add_distance("A", "H", 122)
    add_distance("A", "F", 250)
    #Suggest the shortest way if across the other nodes (location)
    add_distance("A", "B", 566)
    add_distance("A", "D", 323)
    add_distance("A", "E", 712)

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add_distance("A", "G", 479)

# Weight and Direction for Location B - (DESA Wave Pool)
add_distance("B", "C", 147)
add_distance("B", "E", 154)
add_distance("B", "D", 243)
#Suggest the shortest way if across the other nodes (Location)
add_distance("B", "A", 566)
add_distance("B", "F", 553)
add_distance("B", "G", 391)
add_distance("B", "H", 444)

# Weight and Direction for Location C - (Dragon Coaster Ride)
add_distance("C", "B", 147)
add_distance("C", "D", 110)
add_distance("C", "H", 317)
add_distance("C", "A", 500)
#Suggest the shortest way if across the other nodes (Location)
add_distance("C", "E", 301)
add_distance("C", "F", 417)
add_distance("C", "G", 266)

# Weight and Direction for Location D - Zombie House ESCAPE!
add_distance("D", "B", 243)
add_distance("D", "C", 110)
add_distance("D", "H", 201)
add_distance("D", "F", 310)
add_distance("D", "G", 156)
add_distance("D", "E", 389)
#Suggest the shortest way if across the other nodes (Location)
add_distance("D", "A", 323)

# Weight and Direction for Location E - Splash 'N' Swirl Safari
add_distance("E", "B", 154)
add_distance("E", "D", 389)
add_distance("E", "G", 237)
#Suggest the shortest way if across the other nodes (Location)
add_distance("E", "A", 712)
add_distance("E", "C", 301)
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add_distance("E", "F", 699)
add_distance("E", "H", 590)

# Weight and Direction for Location F - VR: Shoot The ENEMY!
add_distance("F", "A", 250)
add_distance("F", "D", 310)
add_distance("F", "G", 496)
add_distance("F", "H", 100)
#Suggest the shortest way if across the other nodes (Location)
add_distance("F", "B", 553)
add_distance("F", "C", 417)
add_distance("F", "G", 496)
add_distance("F", "E", 690)

# Weight and Direction for Location G - MINI Zoo Tour
add_distance("G", "E", 237)
add_distance("G", "D", 156)
add_distance("G", "F", 310)
#Suggest the shortest way if across the other nodes (Location)
add_distance("G", "A", 479)
add_distance("G", "B", 391)
add_distance("G", "C", 310)
add_distance("G", "H", 357)

# Weight and Direction for Location H - Lost Kingdom Ride
add_distance("H", "A", 122)
add_distance("H", "C", 317)
add_distance("H", "D", 201)
add_distance("H", "F", 100)
#Suggest the shortest way if across the other nodes (Location)
add_distance("H", "B", 444)
add_distance("H", "E", 590)
add_distance("H", "G", 357)

# Declare the Variable
totaldistance = 0
distance_menu = 'y'

# Distance Menu Looping
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```

while distance_menu == 'y':
    print()

    # Display MENU for user reference
    print("Hello",name,"!", "Please select from where and where you want to go ")
    print()
    print("————— DISTANCE TRAVEL ————— ")
    print()
    print("      NAME                                LOCATION              ")
    print()
    print("iMagination 3D Theatre                    A                      ")
    print("DESA Wave Pool                            B                      ")
    print("Dragon Coaster Ride                       C                      ")
    print("Zombie House ESCAPE!                     D                      ")
    print("Splash 'N' Swirl Safari                   E                      ")
    print("VR: Shoot That ENEMY!                    F                      ")
    print("MINI Zoo Tour                             G                      ")
    print("Lost Kingdom Ride                         H                      ")
    print()

    # User key in their input
    L1 = input("Enter location: ")
    L1 = L1.capitalize()
    print()
    L2 = input("Enter Next Location: ")
    L2 = L2.capitalize()
    print()

    # Creating Graph
    index1 = find_distance(L1)
    index2 = find_distance(L2)

    distance = find_total_distance(index1,index2)
    totaldistance = totaldistance + distance

    print("Total Distance travelled:",totaldistance,"M")
    print()
    distance_menu = input("Do you wish to continue?(y/n): ")
    print()
    menu = input("Go Back To Main Menu?(y/n): ")
    print()

```

*# user Choose option 3*



[illegible]

Type 'start' to begin

:start

```
*****
◦☆.◦ .:*◦◦◦☆.◦ . WELOCOME TO DESA THEME PARK ◦☆.◦ .:*◦◦◦☆.◦ .:*
*****
```

HELLO WHAT CAN WE HELP YOU TODAY?

♥ MENU ♥

- 1.) PURCHASE TICKETS
- 2.) CHECK CUSTOMER'S NAME
- 3.) DISTANCE TRAVEL
- 4.) EXIT

```
*****
```

Your Options From Menu?(number): 1

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◦◦◦. TICKETS PURCHASE SECTION ◦◦◦.

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Please Enter Your Name: Aisyah Aina Sufia Binti Hilman

Please Enter Your Age: 20

Hello Aisyah Aina Sufia Binti Hilman ! Please Choose Your Game Tickets

| ADULT PACKAGE           |         |              |
|-------------------------|---------|--------------|
| NAME                    | PACKAGE | PRICE        |
| iMagination 3D Theatre  | A       | RM5.00/each  |
| DESA Wave Pool          | B       | RM4.75/each  |
| Dragon Coaster Ride     | C       | RM8.10/each  |
| Zombie House ESCAPE!    | D       | RM5.30/each  |
| Splash 'N' Swirl Safari | E       | RM7.45/each  |
| VR: Shoot That ENEMY!   | F       | RM10.31/each |
| MINI Zoo Tour           | G       | RM3.65/each  |
| Lost Kingdom Ride       | H       | RM6.50/each  |

Choose Your Package: G

How Many Tickets?: 2

'MINI Zoo Tour' Has Added To Cart!

---

Total Price Package G: RM 7.3

Total Current Price: RM 7.3

---

Add More Another Package?(y/n): y

Hello Aisyah Aina Sufia Binti Hilman ! Please Choose Your Game Tickets

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ADULT PACKAGE

---

| NAME                    | PACKAGE | PRICE        |
|-------------------------|---------|--------------|
| iMagination 3D Theatre  | A       | RM5.00/each  |
| DESA Wave Pool          | B       | RM4.75/each  |
| Dragon Coaster Ride     | C       | RM8.10/each  |
| Zombie House ESCAPE!    | D       | RM5.30/each  |
| Splash 'N' Swirl Safari | E       | RM7.45/each  |
| VR: Shoot That ENEMY!   | F       | RM10.31/each |
| MINI Zoo Tour           | G       | RM3.65/each  |
| Lost Kingdom Ride       | H       | RM6.50/each  |

Choose Your Package: c

Quantity of Tickets?: 2

'Dragon Coaster Ride' Has Added To Cart!

---

Total Price Package C: RM 16.2

Total Current Price: RM 23.5

---

Add More Another Package?(y/n): y

Hello Aisyah Aina Sufia Binti Hilman ! Please Choose Your Game Tickets

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**ADULT PACKAGE**

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| NAME                    | PACKAGE | PRICE        |
|-------------------------|---------|--------------|
| iMagination 3D Theatre  | A       | RM5.00/each  |
| DESA Wave Pool          | B       | RM4.75/each  |
| Dragon Coaster Ride     | C       | RM8.10/each  |
| Zombie House ESCAPE!    | D       | RM5.30/each  |
| Splash 'N' Swirl Safari | E       | RM7.45/each  |
| VR: Shoot That ENEMY!   | F       | RM10.31/each |
| MINI Zoo Tour           | G       | RM3.65/each  |
| Lost Kingdom Ride       | H       | RM6.50/each  |

Choose Your Package: B

How Many Tickets?: 2

'DESA Wave Pool' Has Added To Cart!

---

Price of Package B: RM 9.5  
Total Current Price: RM 33.0

---

Add More Another Package?(y/n): n

Next Person?(y/n): n

---

LIST OF CUSTOMER'S NAME

---

Aisyah Aina Sufia Binti Hilman

---

TOTAL PAYMENT IN LIST

---

33.0

Total Customer: 1

Go Back To Main Menu?(y/n): y

```
*****
°☆.。.:* . ° . °☆.。 . WELOCOME TO DESA THEME PARK . °☆.。.:* . ° . °☆.。.:*
*****
```

HELLO WHAT CAN WE HELP YOU TODAY?

♥ MENU ♥

- 1.) PURCHASE TICKETS
- 2.) CHECK CUSTOMER'S NAME
- 3.) DISTANCE TRAVEL
- 4.) EXIT

```
*****
```

In [ ]: