

Navigating an Amusement Park Project

EXTRA CREDIT PROJECT

*This project has the potential to replace one quiz OR test grade from this year.

*This project will be graded for accuracy. Please do not turn in incomplete projects as they will not be graded.

*This project is optional.

*DUE DATE: This project is due on Tuesday May 10th by 3:45. Late projects will absolutely not be accepted.

You visit Disneyland one day and would like to ride all the attractions listed in the table below.

Attraction	Time to Wait and Ride
Splash Mountain	33 minutes
Indiana Jones Adventure	1 hour 5 minutes
Tarzan's Treehouse	17 minutes
Mark Twain Riverboat	28 minutes
Buzz Lightyear Astro Blasters	45 minutes
Space Mountain	1 hour 25 minutes
Alice in Wonderland	38 minutes
King Arthur Carrousel	24 minutes
Mad Tea Party	38 minutes
Pirates of the Caribbean	1 hour 45 minutes

You also estimated the walking times between various attractions ahead of time by reading a map of the park. Those estimates are listed below.

	Tarzan's Treehouse	Splash Mountain	Space Mountain	Pirates of Carib	Mark T. Riverboat	Mad Tea Party	King Arthur	Indiana Jones	Buzz Lightyear
Alice in Wonderland		19				4	4		12
Buzz Lightyear			2		15	11			
Indiana Jones	3			6					
King Arthur		18			14	6			
Mad Tea Party					12				
Mark T. Riverboat	20	22		10					
Pirates of Caribbean	8	10							
Space Mountain	12								
Splash Mountain	11								

Use the information in these tables to answer the questions in each part of this project. It may be helpful to reference a map of Disneyland to help you place your vertices. This is a good one:

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extension://mloajfnmjckfjbeefcdacbelnbliden/https://disneyland.disney.go.com/media/dlr_nextgen/SiteCatalog/PDF/DisneylandParkMap_20130307.pdf

Directions:

Part I – Euler Circuits

1. Make a graph of all of the attractions and the paths between them that are described in the tables provided.
2. Describe the degree of the graph (identify the degree of each vertex).
3. Create an Euler Circuit of the rides/attractions (*Note: You may need to Eulerize the graph!*)
4. Describe in a few sentences what the value of knowing this circuit would be to you at the park. Also, explain what the real-world meaning is if you had to Eulerize the graph.

Part II – Hamiltonian Circuits

1. Make a graph of all of the attractions and paths connecting them; include walking times along the edges from the information provided in the tables.
2. Find the most efficient path using one of the techniques we learned in class.
3. What is the minimum time you would need at Disneyland to ride each attraction listed in these tables? (*Note: You will need to include waiting/riding times in addition to total walking time.*)

Rubric for Grading

Part I				
Make a graph of the rides/attractions.	Each attraction is a vertex and is connected with possible to other vertices by edges. 5 points	Each attraction is labeled. 5 points	A key identifies each attraction. 5 points	/15
Describe the degree of each vertex.	Each vertex is labeled with its degree. 10 points			/10
Create an Euler Circuit of the attractions.	Vertices are identified that require “Eulerizing”. 5 points	Edges are added to Eulerize the graph. 5 points	An Euler circuit is identified. 5 points	/15
Explanation (#4)	Paths a guest would take as a result of Eulerizing the park are discussed. 5 points	The objective for creating an Euler circuit is stated. 5 points	Discussion includes the benefit of creating an Eulerized path. 5 points	/15
Part II				
Make a graph of the rides/attractions.	Each attraction is a vertex and is connected when possible to other vertices by edges. 5 points	Each attraction is labeled. 5 points	A key identifies each attraction. 5 points	/15
Create a Hamiltonian circuit of the rides/attractions	The most efficient path is created. 10 points			/10
Estimate the minimum time needed to ride each attraction.	The total time including the ride time for the most efficient path is indicated. 5 points			/5
Poster	Both graphs are included on the poster 5 points	Answers to all questions are included on the poster. 5 points	The project is half a sheet of poster board. 5 points	/15