The Optimal Bar Hopping Route

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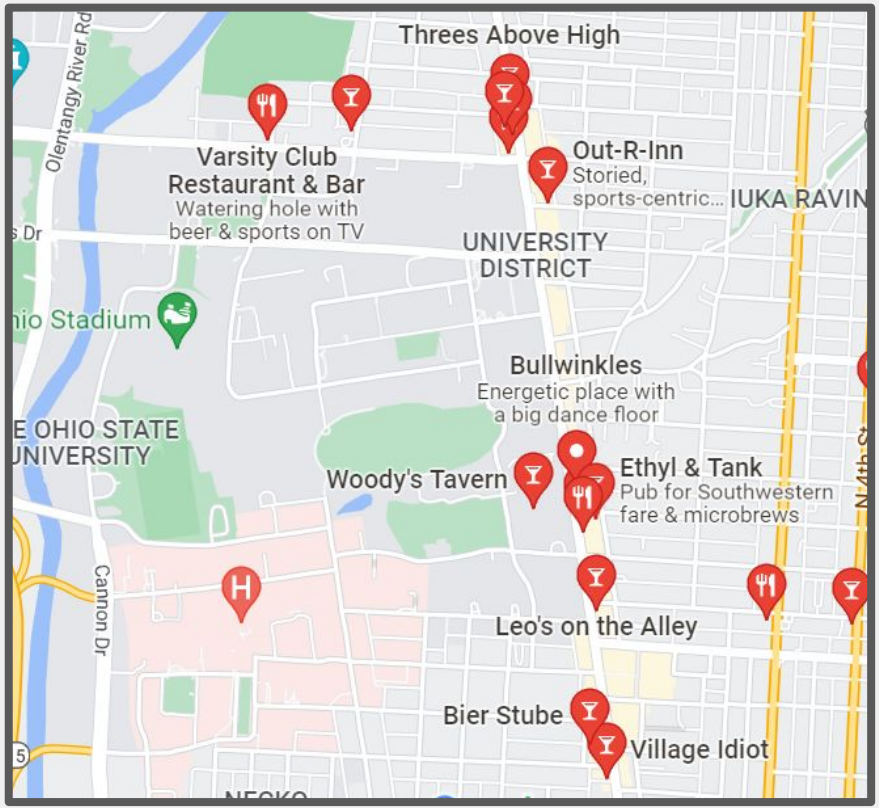
Problem Statement

Given 10 pre-selected bars around campus, we want to create a mixed linear program to find the optimal bar hopping schedule and minimize the cost for a student visiting bars on a Friday night on the OSU Columbus campus.




Process Overview

1. Shortlist the popular bars on campus
2. Generate a table of the prices of drinks, review ratings, time spent at each bar, and the distance between bar i and bar j
    a. Find the average price per drink for each bar
3. Set a reasonable college friendly budget for each bar
4. Use I/O to read the data as constraints
5. Find the bars to visit which minimize the average price per drink
6. Find the optimal route to take for the best walking path

Assumptions and Simplifications

- Little to no wait time outside the bar
- Going out on Friday night only after 10pm.
- Average of 3 of the most popular drinks are considered for the average cost of going to a bar.
- Distance is calculated in miles and cost is calculated in dollars.
- The 10 most popular bars around campus are considered.

Data

Serial no.	Name	Price - bud light	Price - tequila shot	Price - vodka soda	Avg Price	Rating	Hours (Friday)	How much time do people spend?(mins)
1	Threes Above High	$2	$3	$6	$3.67	4.4	7PM - 2AM	23
2	Little Bar	$2	$5	$7	$4.67	4.2	4PM - 2AM	20
3	Library Bar	$3	$3	$3	$3	4.3	1PM - 2AM	25
4	Horseshoe	$3	$5	$6	$4.67	4	6PM - 2:30AM	50
5	Bullwinkles	$5	$3	$6	$4.67	3.1	9PM - 2:15AM	35
6	Midway	$3	$6	$7	$5.33	3.5	2PM - 2AM	60
7	Ethyl and Tank	$5	$8	$9	$7.33	4.2	12PM - 2AM	57
8	Skybar (BigBar)	$5	$8	$8	$7	2.9	8PM - 2AM	45
9	Leo's	$2	$4	$7	$4.33	4.5	5PM - 2AM	30
10	Village idiot	$3	$4	$8	$5	4.5	5PM - 2:30AM	35

How to read - “Usually at bar 1, people on average spend $3.67 per drink. They spend around 20 mins there. The bar is open from 7pm - 2am on Fridays with a rating of 4.4 out of 5 stars.”

Data: distance matrix

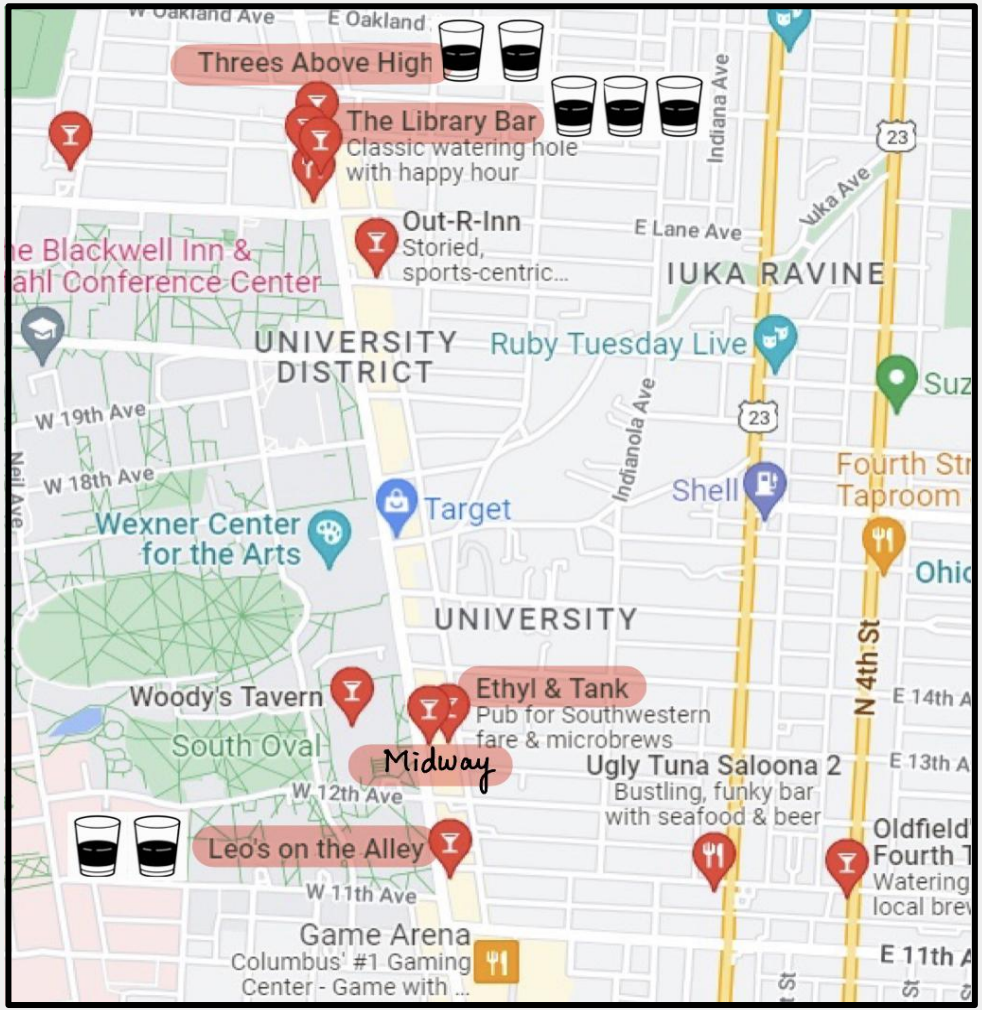
	1	2	3	4	5	6	7	8	9	10
1	0	0.041	0.04	0.053	0.6	0.7	0.7	0.8	0.9	1.1
2	0.041	0	0.045	0.059	0.6	0.7	0.7	0.7	0.8	1.1
3	0.04	0.045	0	0.0136	0.6	0.6	0.6	0.6	0.8	1
4	0.053	0.059	0.0136	0	0.6	0.6	0.6	0.6	0.8	1
5	0.6	0.6	0.6	0.6	0	0.059	0.07	0.07	0.2	0.5
6	0.7	0.7	0.6	0.6	0.059	0	0.014	0.0185	0.1	0.4
7	0.7	0.7	0.6	0.6	0.07	0.014	0	0.06	0.2	0.5
8	0.8	0.7	0.6	0.6	0.07	0.0185	0.06	0	0.1	0.4
9	0.9	0.8	0.8	0.8	0.2	0.1	0.2	0.1	0	0.3
10	1.1	1.1	1	1	0.5	0.4	0.5	0.4	0.3	0

Example: “Distance between bar 1 and bar 2 is 0.041 miles”

Results

Visit bars 1, 3, 6, 7, and 9. Purchase 2 drinks at bar 1, 3 drinks at bar 3, and 2 drinks at bar 9.

The minimum total cost is approximately $25.

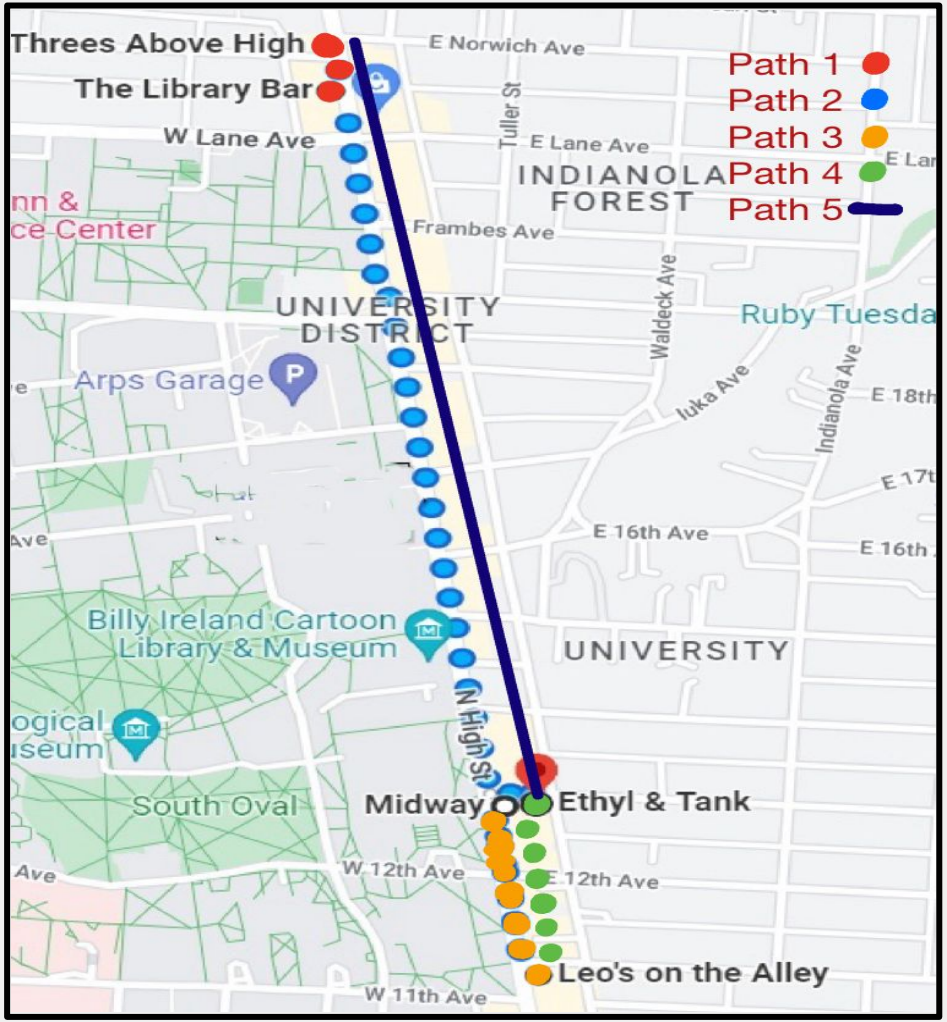


Results

The optimal route to minimise the walking distance based on the bars chosen in the first part of the problem looks like this:

3's -> The Library Bar -> Midway -> Leo's on the alley -> Ethyl and tank -> 3's

The minimum distance is 1.64 miles




HAVE FUN
BUT PLEASE
DRINK
RESPONSIBLY