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Homework - 1

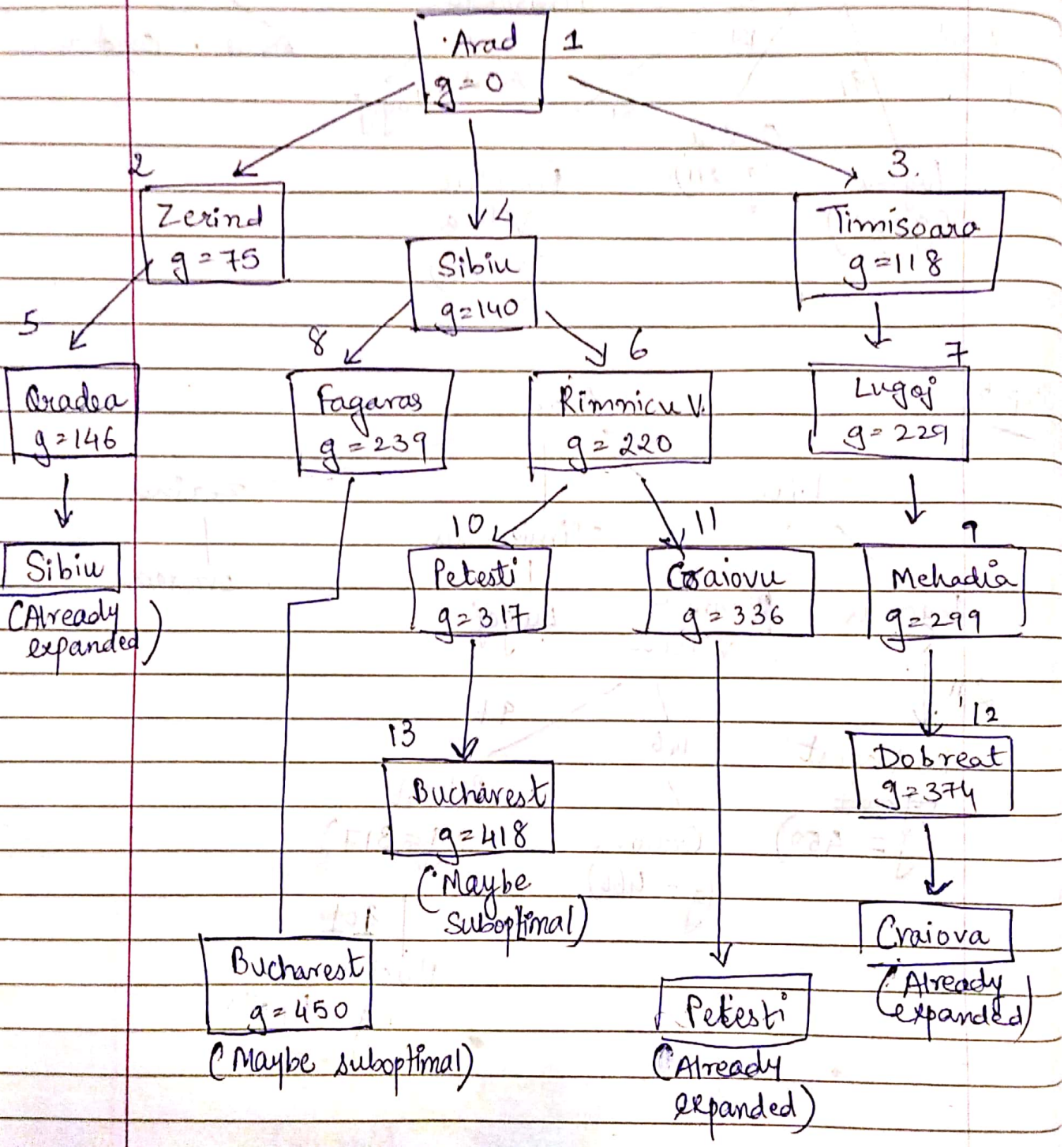
(1)

(a) Supermarket Bar Code scanners

They are tied into a database with records for each item in a specific store. The scanner itself first reads the code and finds the corresponding item in the database and ~~comes up~~ comes up with the correct price. The scanner itself has to be able to recognize that there is a bar code present, scan it and display the information to the cashier and the customer.

(b) Web Search Engines are connected to the every piece of information stored on the internet. Think of it like an all knowing entity. We can type anything in and if it exists on the web, it will find it for ~~you~~ us. The intelligence required isn't that high enough. It seems like a daunting task for a human, but a piece of code that searches the web for any text, image, file etc containing the corresponding text is fairly simple. It's just matching what you typed to what's out there but on a much larger scale. There are options when using search engines, but those only refine the search; such as excluding items from a certain date, only retrieving peer reviewed articles, or only finding images that contain pictures of Iron Man.

(3) From → Arad Uniform Cost Search.
To → Bucharest



Minimum cost from Arad to Bucharest is 418.

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(2) Finding the path from S to G using Depth First Search (DFS).

Generating Successors in order UP, LEFT, RIGHT, DOWN.

	1	2	3	4	5	6	7	8	9	10	11
1	17	16	15	14	13	12	11	10	9		
2	18	19	20	21	22	23	24	25	8	B	
3	28	27	26	B	B	B	B	B	7	B	
4	29	30	B	2	1	3	4	5	6	B	
5	32	31	G 36	B	5					B	
6	33	34	35							B	
7			B							B	
8		B	B	B	B	B	B	B	B	B	
9											

G = Goal State
B = Black Boxes
S = Start state

The Goal node is generated at the 36th step.

(4)

(a) Breadth First Search (BFS)

Expanded node	frontier list
	{S}
S	{A, B, C}
A	{B, C, D, E}
B	{C, D, E, G}
C	{D, E, G, F}
D	{E, G, F, H}
E	{G, F, H}
G	{F, H}

Path: S, B, G
Path cost: 8

(b) Uniform Cost search (UCF)

Expanded Node	Frontier list
	{S}
S	{B=2, C=4, A=5}
B	{C=4, A=5, G=8}
C	{A=5, F=6, G=8}
A	{F=6, G=8, E=9, D=14}
F	{G=7, G=8, E=9, D=14}
G	{G=8, E=9, D=14}

Path: S, C, F, G
Path-Cost = 7.

(c) Iterative Deepening Search (IDS)

Expanded Node	frontier list
	{S}
S	{A, B, C}
A	{B, C}
B	{C}
C	{ }
S	{A, B, C}
A	{D, E, B, C}
D	{E, A, B}
E	{B, C}
B	{G, C}
G	{C}

Path: S, B, G

Path-Cost: 8.