PS2

Graded

Student

Chetan Hiremath

Total Points

82 / 100 pts

Question 1

(no title) — **17** / 20 pts

- ✔ **+ 20 pts** Correct
- ✔ **− 2 pts** Performance Measure not a Measure
- 💬 **− 1 pt** b.obs = fully

Question 2

(no title) — **10** / 10 pts

- ✔ **+ 10 pts** Correct

Question 3

(no title) — **4** / 10 pts

- ✔ **+ 10 pts** Correct
- 💬 **− 6 pts** most parts are not readable

Question 4

(no title) — **10** / 10 pts

- ✔ **+ 10 pts** Correct

Question 5

(no title) — **8** / 10 pts

- ✔ **+ 10 pts** Correct
- 💬 **− 2 pts** Point adjustment

Question 6

(no title) **3** / 10 pts

- ✔ **+ 10 pts** Correct
- ✔ **− 5 pts** Memory not done correctly
- ✔ **− 2 pts** Doesn't quite work

Question 7

(no title) **30** / 30 pts

- ✔ **+ 30 pts** Correct

Question assigned to the following page: 1

1.

Agent Type	Performance Measure	Environment	Actuators	Sensors
Exploring the subsurface oceans of titans	Mapping of oceans and environment identification.	water and life forms.	Arms and propellers	Cameras, Sonars, and Mobor sensors,
Shopping for used AI books on the internet	Low price costs of AI books, and good deals.	Internet, other Shopping sites, and customers.	Keyboard and mouse.	Monitor display and access to details.

Task Enviroments	Observable	Agents	Deterministic	Episodic	Static	Discrete
Exploring the subsurface ocean of Titans	Partially Observable	Single Agent	Stochastic	Sequential	Dynamic	Continuous
Shopping for used AI books on the internet	Partially Observable	Multi Agent	Deterministic	Sequential	Static	Discrete

Question assigned to the following page: 2

2. If there are $|P|$ percepts and $|A|$ actions, then the total number of SIR agents is $|A|^{|P|}$. So, the total number of SIR agents is $|A|^{|P|} = 2^2 = 4$ when $|P| = 2$ ({No Light, Light}) and $|A| = 2$ ({Stay, Move}).

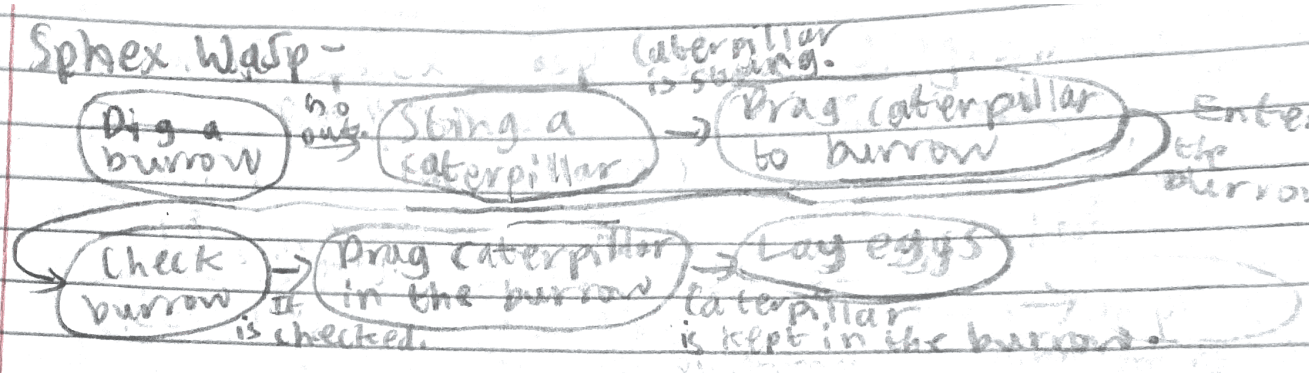
$|P| = 4$ ({(A, Clean), (B, Clean), (A, Dirty), (B, Dirty)})

$|A| = 3$ ({Left, Right, Suck})

So, the total number of SIR agents of the vacuum cleaner agents is $|A|^{|P|} = 3^4 = 81$.

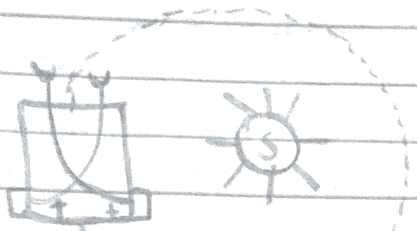
Question assigned to the following page: 3

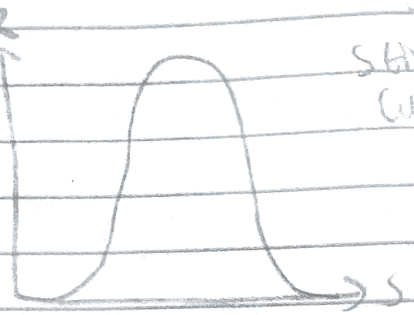
3. Sphex Wasp -


Dig a burrow
No entry.
String a caterpillar
Caterpillar is stinging.
Drag caterpillar to burrow
Enter the burrow.
Check burrow
If is checked.
Drag caterpillar in the burrow
Lay eggs
Caterpillar is kept in the burrow.

Question assigned to the following page: 4

4.



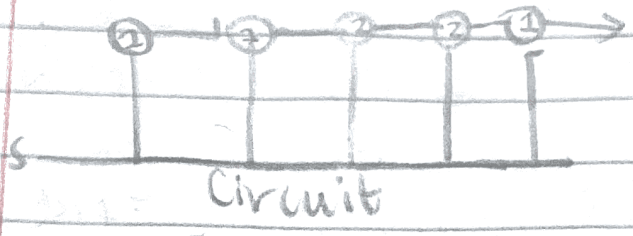


Stimulu-Response Curve

Vehicle circles a source.

Question assigned to the following page: 5

5.



t	s	v	w	x	y	z
0	0	0	0	0	0	0
1	1	0	0	0	0	0
2	2	1	1	0	0	0
3	3	1	0	1	0	0
4	3	1	0	1	2	0
5	3	1	0	0	0	0

$v_{t+1} = [s_t \geq 1]$

$w_{t+1} = [s_t - v_t \geq 1]$

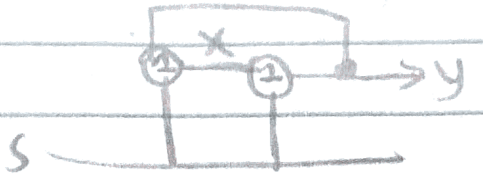
$x_{t+1} = [s_t + w_t \geq 2]$

$y_{t+1} = [s_t + x_t \geq 2]$

$z_{t+1} = [y_t - s_t \geq 1]$

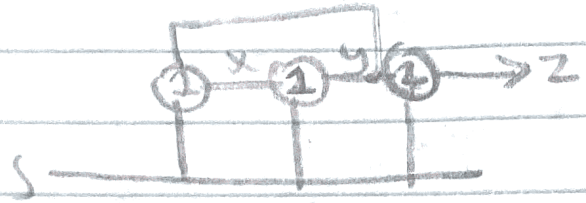
Question assigned to the following page: 6

6a.



x - red light / input
y - bell ring / output

b.



x - red light / input
y - red light / input
z - bell ring / output

Question assigned to the following page: 7

7. The Initial SIR Table-

Percept	Action
[A, Clean]	Right
[A, Dirty]	Suck
[B, Clean]	Left
[B, Dirty]	Suck

Performance table-

A State	B State	Agent Location	Score
Dirty	Dirty	A	1998
Dirty	Dirty	B	1998
Dirty	Clean	A	2000
Dirty	Clean	B	1999
Clean	Dirty	A	1999
Clean	Dirty	B	2000
Clean	Clean	A	2000
Clean	Clean	B	2000

Question assigned to the following page: 7

I have structured the program by having an environment and an agent to store the states of 2 locations (Clean- (0,0) and Dirty- (1,0)). Then, I have borrowed and modified the code from vacuum_world.ipynb file's simple reflex agent portion to make sure that the performances are recorded when the possible combinations are used for the dirt configurations and agent locations. The performances are added, and their average is calculated for the 8 possible configurations. The configurations are shown on the performance table. The "A" and "B" states are initial states to update the statuses of locations, and the agent chooses an action from the S/R table that has percepts. Then, the agent's location status is updated in the program to measure the performance. Its performance is increased by 1 for one clean location, and the average of the 8 possible configurations is 1999.25 when the configurations vacuum dirt and clean the certain location.