Artificial Intelligence
Assignment-2
Report

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Symbols generated by code w.r.t the given possible actions and states to interpret the policies.
G - Goal State
W - Wall
E - End State
> - East Direction
< - West Direction
^ - North Direction
V - South Direction

Part-B

1) a) Step cost = -3.6, Discount Factor = 0.1

Output Generated By Program

```
Iteration Count :- 3
3.6 0.0 -0.763 36.0
-3.381 -3.943 -3.704 -0.765
-3.943 -3.967 0.0 -3.733
-3.961 -3.994 -7.2 -3.965
G W > G
^ < ^ ^
^ < W ^
^ < E ^
```

As discount factor is low then agent is aiming for low reward as no. of step are larger for higher reward.

1) b) Step cost = -3.6, Discount Factor = 0.99

Output Generated By Program

```
Iteration Count :- 10
3.6 0.0 30.527 36.0
14.177 20.71 26.193 30.527
10.541 15.364 0.0 25.658
6.18 8.467 -7.2 17.767
G W > G
> > > ^
> ^ W ^
^ ^ E ^
```

As discount factor is increasing then agent is aiming for highest reward irrespective of no. of step doesn't matter here.

2) a) Step Cost = -36, Discount Factor = 0.99

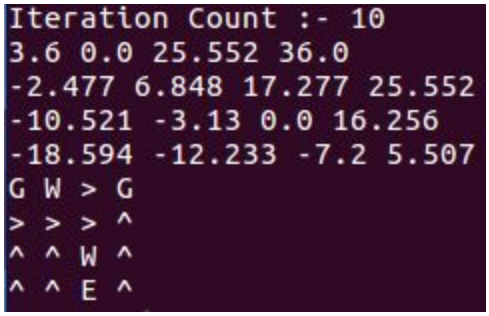
Output Generated By Program

```
Iteration Count :- 61
3.6 0.0 2369.92 36.0
2477.791 2488.379 2485.277 2469.258
2489.815 2500.584 0.0 2477.894
2499.531 2509.487 -7.2 2386.864
G W v G
v v < <
> v W ^
> ^ E ^
```

As step cost is positive that's why agent is not going to end state. It's revolving in world only.

b) Step Cost = -7.2, Discount Factor = 0.99

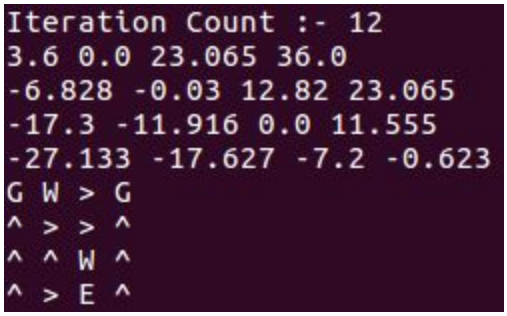
Output Generated By Program



As step cost is negative but not highly negative that's why agent is leaving with end state having highest reward only.

c) Step Cost = -9, Discount Factor = 0.99

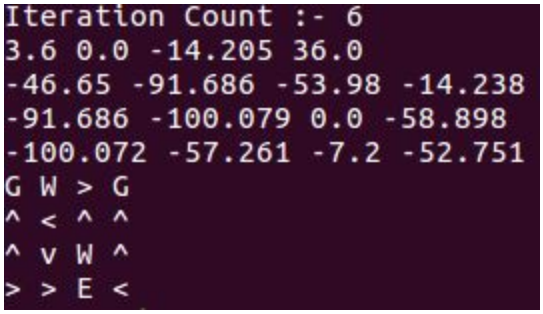
Output Generated By Program



As step cost is negative but not highly negative that's why agent is leaving with end state having any positive reward.You can see difference from above case that it's not only looking for end state with highest reward.

d) Step Cost = -36, Discount Factor = 0.99

Output Generated By Program



As step cost is highly negative that's why it looking for any end state not for only rewarding end state but negatively rewarding end state would also work.