```
c743h357@ENGR1005-07:~/EECS658/ChetanHiremath_Assignment8$ python
ReinforcementML.py
RL MONTE CARLO FIRST VISIT ALGORITHM:
Epoch 0 (Initial Values - First Visit Method)
N(s)
[[0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]]
S(s)
[[0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]]
V(s)
[[0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]]

Epoch 1 - First Visit Method
N(s)
[[0. 1. 1. 1. 0.]
 [0. 0. 1. 1. 1.]
 [0. 0. 1. 0. 0.]
 [0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]]
S(s)
[[ 0.   -1.   -1.9  -5.7   0.  ]
 [ 0.    0.   -4.1  -6.13 -6.51]
 [ 0.    0.   -3.44  0.    0.  ]
 [ 0.    0.    0.    0.    0.  ]
 [ 0.    0.    0.    0.    0.  ]]
V(s)
[[ 0.   -1.   -1.9  -5.7   0.  ]
 [ 0.    0.   -4.1  -6.13 -6.51]
 [ 0.    0.   -3.44  0.    0.  ]
 [ 0.    0.    0.    0.    0.  ]
 [ 0.    0.    0.    0.    0.  ]]
k, s, r, γ, and G(s):
[[ 1.          9.         -1.          0.9        -6.5132156 ]
 [ 2.          8.         -1.          0.9        -6.12579511]
 [ 3.          3.         -1.          0.9        -5.6953279 ]
 [ 4.          3.         -1.          0.9        -5.217031  ]
 [ 5.          8.         -1.          0.9        -4.68559   ]
 [ 6.          7.         -1.          0.9        -4.0951    ]
 [ 7.         12.         -1.          0.9        -3.439     ]
 [ 8.          7.         -1.          0.9        -2.71      ]
 [ 9.          2.         -1.          0.9        -1.9       ]
 [10.          1.         -1.          0.9        -1.        ]
 [11.          0.          0.          0.9         0.        ]]

Epoch 10 - First Visit Method
N(s)
[[0. 4. 3. 3. 2.]
 [3. 4. 6. 7. 5.]
 [4. 6. 8. 4. 3.]
 [4. 3. 6. 6. 5.]
 [3. 4. 4. 5. 0.]]
S(s)
[[  0.    -5.71 -12.32 -24.23 -18.78]
```

```
 [-11.11 -29.82 -44.44 -57.01 -44.13]
 [-20.24 -38.29 -59.06 -33.4  -28.23]
 [-28.32 -23.29 -50.16 -50.75 -38.71]
 [-25.47 -34.6  -34.28 -36.24   0.  ]]
V(s)
[[ 0.   -1.43 -4.11 -8.08 -9.39]
 [-3.7  -7.45 -7.41 -8.14 -8.83]
 [-5.06 -6.38 -7.38 -8.35 -9.41]
 [-7.08 -7.76 -8.36 -8.46 -7.74]
 [-8.49 -8.65 -8.57 -7.25  0.  ]]
k, s, r, γ, and G(s):
[[ 1.         21.         -1.          0.9        -9.96242898]
 [ 2.         20.         -1.          0.9        -9.95825442]
 [ 3.         20.         -1.          0.9        -9.95361602]
 [ 4.         20.         -1.          0.9        -9.94846225]
 [ 5.         20.         -1.          0.9        -9.94273583]
 [ 6.         15.         -1.          0.9        -9.93637315]
 [ 7.         15.         -1.          0.9        -9.9293035 ]
 [ 8.         16.         -1.          0.9        -9.92144833]
 [ 9.         21.         -1.          0.9        -9.91272036]
 [10.         22.         -1.          0.9        -9.90302263]
 [11.         17.         -1.          0.9        -9.89224736]
 [12.         12.         -1.          0.9        -9.88027485]
 [13.         13.         -1.          0.9        -9.86697205]
 [14.         18.         -1.          0.9        -9.85219117]
 [15.         23.         -1.          0.9        -9.83576797]
 [16.         18.         -1.          0.9        -9.81751996]
 [17.         23.         -1.          0.9        -9.7972444 ]
 [18.         18.         -1.          0.9        -9.774716  ]
 [19.         13.         -1.          0.9        -9.74968445]
 [20.          8.         -1.          0.9        -9.72187161]
 [21.         13.         -1.          0.9        -9.69096846]
 [22.          8.         -1.          0.9        -9.65663162]
 [23.          7.         -1.          0.9        -9.61847958]
 [24.          8.         -1.          0.9        -9.57608842]
 [25.          7.         -1.          0.9        -9.52898713]
 [26.          6.         -1.          0.9        -9.47665237]
 [27.         11.         -1.          0.9        -9.41850263]
 [28.         16.         -1.          0.9        -9.35389181]
 [29.         21.         -1.          0.9        -9.28210201]
 [30.         21.         -1.          0.9        -9.20233557]
 [31.         21.         -1.          0.9        -9.11370619]
 [32.         22.         -1.          0.9        -9.0152291 ]
 [33.         21.         -1.          0.9        -8.90581011]
 [34.         22.         -1.          0.9        -8.78423345]
 [35.         21.         -1.          0.9        -8.64914828]
 [36.         22.         -1.          0.9        -8.49905365]
 [37.         17.         -1.          0.9        -8.33228183]
 [38.         12.         -1.          0.9        -8.14697981]
 [39.         17.         -1.          0.9        -7.94108868]
 [40.         22.         -1.          0.9        -7.71232075]
 [41.         23.         -1.          0.9        -7.45813417]
 [42.         22.         -1.          0.9        -7.17570464]
 [43.         17.         -1.          0.9        -6.86189404]
 [44.         12.         -1.          0.9        -6.5132156 ]
 [45.         11.         -1.          0.9        -6.12579511]
 [46.         12.         -1.          0.9        -5.6953279 ]
 [47.          7.         -1.          0.9        -5.217031  ]
 [48.          6.         -1.          0.9        -4.68559   ]
 [49.         11.         -1.          0.9        -4.0951    ]
 [50.         12.         -1.          0.9        -3.439     ]
 [51.         13.         -1.          0.9        -2.71      ]
 [52.         18.         -1.          0.9        -1.9       ]
 [53.         23.         -1.          0.9        -1.        ]
```

```
 [54.         24.          0.          0.9         0.        ]]

Epoch 966 (Final Epoch - First Visit Method)
N(s)
[[  0. 420. 428. 398. 333.]
 [411. 507. 506. 469. 391.]
 [426. 515. 549. 510. 411.]
 [401. 477. 532. 533. 407.]
 [335. 414. 424. 425.   0.]]
S(s)
[[    0.   -2386.   -3349.27 -3496.61 -3026.88]
 [-2352.1  -3676.88 -4184.07 -4060.33 -3410.99]
 [-3290.   -4202.34 -4569.82 -4173.39 -3216.83]
 [-3466.24 -4091.   -4303.47 -3828.79 -2458.34]
 [-2953.38 -3535.57 -3289.64 -2350.91     0.  ]]
V(s)
[[ 0.   -5.68 -7.83 -8.79 -9.09]
 [-5.72 -7.25 -8.27 -8.66 -8.72]
 [-7.72 -8.16 -8.32 -8.18 -7.83]
 [-8.64 -8.58 -8.09 -7.18 -6.04]
 [-8.82 -8.54 -7.76 -5.53  0.  ]]
k, s, r, γ, and G(s):
[[ 1.       14.       -1.        0.9      -5.217031]
 [ 2.       14.       -1.        0.9      -4.68559 ]
 [ 3.       19.       -1.        0.9      -4.0951  ]
 [ 4.       19.       -1.        0.9      -3.439   ]
 [ 5.       14.       -1.        0.9      -2.71    ]
 [ 6.       14.       -1.        0.9      -1.9     ]
 [ 7.       19.       -1.        0.9      -1.      ]
 [ 8.       24.        0.        0.9       0.      ]]

RL MONTE CARLO EVERY VISIT ALGORITHM:
Epoch 0 (Initial Values - Every Visit Method)
N(s)
[[0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]]
S(s)
[[0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]]
V(s)
[[0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]
 [0. 0. 0. 0. 0.]]

Epoch 1 - Every Visit Method
N(s)
[[0. 0. 6. 7. 6.]
 [0. 0. 3. 6. 6.]
 [0. 0. 4. 8. 3.]
 [0. 0. 1. 2. 1.]
 [0. 0. 0. 0. 0.]]
S(s)
[[  0.     0.   -55.61 -61.88 -55.91]
 [  0.     0.   -25.8  -47.51 -52.73]
 [  0.     0.   -35.19 -64.01 -19.02]
 [  0.     0.    -9.88 -11.79  -1.  ]
```

```
 [  0.     0.     0.     0.     0.  ]]
V(s)
[[ 0.    0.   -9.27 -8.84 -9.32]
 [ 0.    0.   -8.6  -7.92 -8.79]
 [ 0.    0.   -8.8  -8.   -6.34]
 [ 0.    0.   -9.88 -5.9  -1.  ]
 [ 0.    0.    0.    0.    0.  ]]
k, s, r, γ, and G(s):
[[ 1.          3.         -1.          0.9        -9.96242898]
 [ 2.          2.         -1.          0.9        -9.95825442]
 [ 3.          2.         -1.          0.9        -9.95361602]
 [ 4.          3.         -1.          0.9        -9.94846225]
 [ 5.          2.         -1.          0.9        -9.94273583]
 [ 6.          7.         -1.          0.9        -9.93637315]
 [ 7.          8.         -1.          0.9        -9.9293035 ]
 [ 8.         13.         -1.          0.9        -9.92144833]
 [ 9.         12.         -1.          0.9        -9.91272036]
 [10.         13.         -1.          0.9        -9.90302263]
 [11.         18.         -1.          0.9        -9.89224736]
 [12.         17.         -1.          0.9        -9.88027485]
 [13.         12.         -1.          0.9        -9.86697205]
 [14.         13.         -1.          0.9        -9.85219117]
 [15.          8.         -1.          0.9        -9.83576797]
 [16.          9.         -1.          0.9        -9.81751996]
 [17.          4.         -1.          0.9        -9.7972444 ]
 [18.          4.         -1.          0.9        -9.774716  ]
 [19.          9.         -1.          0.9        -9.74968445]
 [20.          9.         -1.          0.9        -9.72187161]
 [21.          9.         -1.          0.9        -9.69096846]
 [22.          9.         -1.          0.9        -9.65663162]
 [23.          4.         -1.          0.9        -9.61847958]
 [24.          4.         -1.          0.9        -9.57608842]
 [25.          3.         -1.          0.9        -9.52898713]
 [26.          2.         -1.          0.9        -9.47665237]
 [27.          2.         -1.          0.9        -9.41850263]
 [28.          7.         -1.          0.9        -9.35389181]
 [29.         12.         -1.          0.9        -9.28210201]
 [30.         13.         -1.          0.9        -9.20233557]
 [31.         14.         -1.          0.9        -9.11370619]
 [32.         13.         -1.          0.9        -9.0152291 ]
 [33.          8.         -1.          0.9        -8.90581011]
 [34.          3.         -1.          0.9        -8.78423345]
 [35.          4.         -1.          0.9        -8.64914828]
 [36.          4.         -1.          0.9        -8.49905365]
 [37.          3.         -1.          0.9        -8.33228183]
 [38.          3.         -1.          0.9        -8.14697981]
 [39.          8.         -1.          0.9        -7.94108868]
 [40.         13.         -1.          0.9        -7.71232075]
 [41.          8.         -1.          0.9        -7.45813417]
 [42.          3.         -1.          0.9        -7.17570464]
 [43.          2.         -1.          0.9        -6.86189404]
 [44.          7.         -1.          0.9        -6.5132156 ]
 [45.         12.         -1.          0.9        -6.12579511]
 [46.         13.         -1.          0.9        -5.6953279 ]
 [47.         14.         -1.          0.9        -5.217031  ]
 [48.         14.         -1.          0.9        -4.68559   ]
 [49.          9.         -1.          0.9        -4.0951    ]
 [50.          8.         -1.          0.9        -3.439     ]
 [51.         13.         -1.          0.9        -2.71      ]
 [52.         18.         -1.          0.9        -1.9       ]
 [53.         19.         -1.          0.9        -1.        ]
 [54.         24.          0.          0.9         0.        ]]

Epoch 10 - Every Visit Method
```

N(s)

```
[[ 0.  4. 13. 12. 31.]
 [ 9. 10. 20. 18. 24.]
 [18. 21. 21. 19. 14.]
 [23. 20. 25. 20. 14.]
 [14. 19. 23. 19.  0.]]
```

S(s)

```
[[   0.    -26.22  -95.99 -108.01 -298.24]
 [ -48.64  -70.91 -158.11 -157.83 -211.9 ]
 [-135.78 -172.14 -183.43 -157.02 -114.41]
 [-193.41 -178.19 -227.73 -155.41 -113.31]
 [-129.73 -174.57 -174.89  -86.99    0.  ]]
```

V(s)

```
[[ 0.   -6.55 -7.38 -9.   -9.62]
 [-5.4  -7.09 -7.91 -8.77 -8.83]
 [-7.54 -8.2  -8.73 -8.26 -8.17]
 [-8.41 -8.91 -9.11 -7.77 -8.09]
 [-9.27 -9.19 -7.6  -4.58  0.  ]]
```

k, s, r, γ, and G(s):

```
[[  1.          17.          -1.          0.9         -9.99999961]
 [  2.          12.          -1.          0.9         -9.99999957]
 [  3.          11.          -1.          0.9         -9.99999952]
 [  4.          12.          -1.          0.9         -9.99999947]
 [  5.          11.          -1.          0.9         -9.99999941]
 [  6.          10.          -1.          0.9         -9.99999935]
 [  7.          10.          -1.          0.9         -9.99999927]
 [  8.          11.          -1.          0.9         -9.99999919]
 [  9.          10.          -1.          0.9         -9.9999991 ]
 [ 10.          11.          -1.          0.9         -9.999999  ]
 [ 11.           6.          -1.          0.9         -9.99999889]
 [ 12.           1.          -1.          0.9         -9.99999877]
 [ 13.           1.          -1.          0.9         -9.99999863]
 [ 14.           2.          -1.          0.9         -9.99999848]
 [ 15.           7.          -1.          0.9         -9.99999831]
 [ 16.           8.          -1.          0.9         -9.99999812]
 [ 17.          13.          -1.          0.9         -9.99999791]
 [ 18.          14.          -1.          0.9         -9.99999768]
 [ 19.          14.          -1.          0.9         -9.99999742]
 [ 20.          14.          -1.          0.9         -9.99999714]
 [ 21.           9.          -1.          0.9         -9.99999682]
 [ 22.           8.          -1.          0.9         -9.99999647]
 [ 23.           3.          -1.          0.9         -9.99999607]
 [ 24.           4.          -1.          0.9         -9.99999564]
 [ 25.           4.          -1.          0.9         -9.99999515]
 [ 26.           4.          -1.          0.9         -9.99999461]
 [ 27.           3.          -1.          0.9         -9.99999402]
 [ 28.           4.          -1.          0.9         -9.99999335]
 [ 29.           4.          -1.          0.9         -9.99999261]
 [ 30.           4.          -1.          0.9         -9.99999179]
 [ 31.           4.          -1.          0.9         -9.99999088]
 [ 32.           3.          -1.          0.9         -9.99998987]
 [ 33.           3.          -1.          0.9         -9.99998874]
 [ 34.           4.          -1.          0.9         -9.99998749]
 [ 35.           4.          -1.          0.9         -9.9999861 ]
 [ 36.           4.          -1.          0.9         -9.99998455]
 [ 37.           4.          -1.          0.9         -9.99998284]
 [ 38.           4.          -1.          0.9         -9.99998093]
 [ 39.           4.          -1.          0.9         -9.99997881]
 [ 40.           4.          -1.          0.9         -9.99997646]
 [ 41.           4.          -1.          0.9         -9.99997384]
 [ 42.           9.          -1.          0.9         -9.99997094]
 [ 43.           4.          -1.          0.9         -9.99996771]
 [ 44.           4.          -1.          0.9         -9.99996412]
 [ 45.           4.          -1.          0.9         -9.99996013]
```

```
[ 46.          4.         -1.          0.9         -9.9999557 ]
[ 47.          9.         -1.          0.9         -9.99995078]
[ 48.          9.         -1.          0.9         -9.99994531]
[ 49.          9.         -1.          0.9         -9.99993924]
[ 50.         14.         -1.          0.9         -9.99993248]
[ 51.         13.         -1.          0.9         -9.99992498]
[ 52.         12.         -1.          0.9         -9.99991665]
[ 53.         13.         -1.          0.9         -9.99990739]
[ 54.          8.         -1.          0.9         -9.9998971 ]
[ 55.         13.         -1.          0.9         -9.99988566]
[ 56.         18.         -1.          0.9         -9.99987296]
[ 57.         23.         -1.          0.9         -9.99985884]
[ 58.         22.         -1.          0.9         -9.99984316]
[ 59.         21.         -1.          0.9         -9.99982573]
[ 60.         20.         -1.          0.9         -9.99980637]
[ 61.         21.         -1.          0.9         -9.99978485]
[ 62.         21.         -1.          0.9         -9.99976095]
[ 63.         20.         -1.          0.9         -9.99973439]
[ 64.         20.         -1.          0.9         -9.99970487]
[ 65.         15.         -1.          0.9         -9.99967208]
[ 66.         15.         -1.          0.9         -9.99963565]
[ 67.         20.         -1.          0.9         -9.99959516]
[ 68.         21.         -1.          0.9         -9.99955018]
[ 69.         21.         -1.          0.9         -9.9995002 ]
[ 70.         21.         -1.          0.9         -9.99944467]
[ 71.         21.         -1.          0.9         -9.99938296]
[ 72.         22.         -1.          0.9         -9.9993144 ]
[ 73.         21.         -1.          0.9         -9.99923823]
[ 74.         20.         -1.          0.9         -9.99915359]
[ 75.         20.         -1.          0.9         -9.99905954]
[ 76.         21.         -1.          0.9         -9.99895504]
[ 77.         16.         -1.          0.9         -9.99883894]
[ 78.         17.         -1.          0.9         -9.99870993]
[ 79.         12.         -1.          0.9         -9.99856659]
[ 80.          7.         -1.          0.9         -9.99840732]
[ 81.         12.         -1.          0.9         -9.99823036]
[ 82.         17.         -1.          0.9         -9.99803373]
[ 83.         22.         -1.          0.9         -9.99781525]
[ 84.         17.         -1.          0.9         -9.99757251]
[ 85.         12.         -1.          0.9         -9.99730278]
[ 86.          7.         -1.          0.9         -9.99700309]
[ 87.          8.         -1.          0.9         -9.9966701 ]
[ 88.          9.         -1.          0.9         -9.99630012]
[ 89.          9.         -1.          0.9         -9.99588902]
[ 90.          8.         -1.          0.9         -9.99543224]
[ 91.          9.         -1.          0.9         -9.99492471]
[ 92.          9.         -1.          0.9         -9.99436079]
[ 93.          9.         -1.          0.9         -9.99373421]
[ 94.          4.         -1.          0.9         -9.99303801]
[ 95.          4.         -1.          0.9         -9.99226446]
[ 96.          4.         -1.          0.9         -9.99140496]
[ 97.          9.         -1.          0.9         -9.99044995]
[ 98.          8.         -1.          0.9         -9.98938883]
[ 99.         13.         -1.          0.9         -9.98820982]
[100.         18.         -1.          0.9         -9.98689979]
[101.         17.         -1.          0.9         -9.98544422]
[102.         18.         -1.          0.9         -9.98382691]
[103.         13.         -1.          0.9         -9.9820299 ]
[104.         12.         -1.          0.9         -9.98003322]
[105.          7.         -1.          0.9         -9.97781469]
[106.          2.         -1.          0.9         -9.97534965]
[107.          7.         -1.          0.9         -9.97261073]
[108.         12.         -1.          0.9         -9.96956747]
[109.          7.         -1.          0.9         -9.96618608]
```

```
 [110.           8.          -1.           0.9         -9.96242898]
 [111.           7.          -1.           0.9         -9.95825442]
 [112.           6.          -1.           0.9         -9.95361602]
 [113.          11.          -1.           0.9         -9.94846225]
 [114.          16.          -1.           0.9         -9.94273583]
 [115.          15.          -1.           0.9         -9.93637315]
 [116.          15.          -1.           0.9         -9.9293035 ]
 [117.          16.          -1.           0.9         -9.92144833]
 [118.          17.          -1.           0.9         -9.91272036]
 [119.          22.          -1.           0.9         -9.90302263]
 [120.          23.          -1.           0.9         -9.89224736]
 [121.          18.          -1.           0.9         -9.88027485]
 [122.          19.          -1.           0.9         -9.86697205]
 [123.          18.          -1.           0.9         -9.85219117]
 [124.          17.          -1.           0.9         -9.83576797]
 [125.          18.          -1.           0.9         -9.81751996]
 [126.          23.          -1.           0.9         -9.7972444 ]
 [127.          18.          -1.           0.9         -9.774716  ]
 [128.          19.          -1.           0.9         -9.74968445]
 [129.          18.          -1.           0.9         -9.72187161]
 [130.          13.          -1.           0.9         -9.69096846]
 [131.          12.          -1.           0.9         -9.65663162]
 [132.          11.          -1.           0.9         -9.61847958]
 [133.          10.          -1.           0.9         -9.57608842]
 [134.          15.          -1.           0.9         -9.52898713]
 [135.          20.          -1.           0.9         -9.47665237]
 [136.          20.          -1.           0.9         -9.41850263]
 [137.          21.          -1.           0.9         -9.35389181]
 [138.          21.          -1.           0.9         -9.28210201]
 [139.          20.          -1.           0.9         -9.20233557]
 [140.          15.          -1.           0.9         -9.11370619]
 [141.          10.          -1.           0.9         -9.0152291 ]
 [142.          11.          -1.           0.9         -8.90581011]
 [143.          12.          -1.           0.9         -8.78423345]
 [144.          17.          -1.           0.9         -8.64914828]
 [145.          22.          -1.           0.9         -8.49905365]
 [146.          23.          -1.           0.9         -8.33228183]
 [147.          22.          -1.           0.9         -8.14697981]
 [148.          22.          -1.           0.9         -7.94108868]
 [149.          22.          -1.           0.9         -7.71232075]
 [150.          17.          -1.           0.9         -7.45813417]
 [151.          16.          -1.           0.9         -7.17570464]
 [152.          15.          -1.           0.9         -6.86189404]
 [153.          20.          -1.           0.9         -6.5132156 ]
 [154.          21.          -1.           0.9         -6.12579511]
 [155.          22.          -1.           0.9         -5.6953279 ]
 [156.          22.          -1.           0.9         -5.217031  ]
 [157.          17.          -1.           0.9         -4.68559   ]
 [158.          22.          -1.           0.9         -4.0951    ]
 [159.          23.          -1.           0.9         -3.439     ]
 [160.          18.          -1.           0.9         -2.71      ]
 [161.          23.          -1.           0.9         -1.9       ]
 [162.          23.          -1.           0.9         -1.        ]
 [163.          24.           0.           0.9          0.        ]]

Epoch 560 (Final Epoch - Every Visit Method)
N(s)
[[   0.  557.  805. 1010. 1086.]
 [ 534.  698.  818.  952.  922.]
 [ 782.  848.  936.  931.  853.]
 [ 965.  940.  928.  754.  559.]
 [1096.  972.  878.  586.    0.]]
S(s)
[[    0.   -3316.98 -6387.72 -8672.91 -9670.45]
```

```
 [-3025.27 -5094.77 -6784.9  -8184.64 -8027.32]
 [-6216.62 -6953.3  -7951.14 -7737.66 -6735.68]
 [-8344.75 -7952.09 -7679.73 -5650.51 -3160.18]
 [-9705.66 -8329.07 -6824.02 -3269.53     0.  ]]
V(s)
[[ 0.   -5.96 -7.94 -8.59 -8.9 ]
 [-5.67 -7.3  -8.29 -8.6  -8.71]
 [-7.95 -8.2  -8.49 -8.31 -7.9 ]
 [-8.65 -8.46 -8.28 -7.49 -5.65]
 [-8.86 -8.57 -7.77 -5.58  0.  ]]
k, s, r, γ, and G(s):
[[ 1.   5.  -1.   0.9 -1. ]
 [ 2.   0.   0.   0.9  0. ]]

RL Q-LEARNING ALGORITHM:
Q-Learning Rewards Matrix (R)
```

S\A	0	1	2	3	4	5	6	7	8	9	10	11	12
	13	14	15	16	17	18	19	20	21	22	23	24	
0	100	0	-1	-1	-1	0	-1	-1	-1	-1	-1	-1	-1
	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
1	100	-1	0	-1	-1	-1	0	-1	-1	-1	-1	-1	-1
	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
2	-1	0	-1	0	-1	-1	-1	0	-1	-1	-1	-1	-1
	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
3	-1	-1	0	-1	0	-1	-1	-1	0	-1	-1	-1	-1
	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
4	-1	-1	-1	0	-1	-1	-1	-1	-1	0	-1	-1	-1
	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
5	100	-1	-1	-1	-1	-1	0	-1	-1	-1	0	-1	-1
	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
6	-1	0	-1	-1	-1	0	-1	0	-1	-1	-1	0	-1
	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
7	-1	-1	0	-1	-1	-1	0	-1	0	-1	-1	-1	0
	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
8	-1	-1	-1	0	-1	-1	-1	0	-1	0	-1	-1	-1
	0	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
9	-1	-1	-1	-1	0	-1	-1	-1	0	-1	-1	-1	-1
	-1	0	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
10	-1	-1	-1	-1	-1	0	-1	-1	-1	-1	-1	0	-1
	-1	-1	0	-1	-1	-1	-1	-1	-1	-1	-1	-1	
11	-1	-1	-1	-1	-1	-1	0	-1	-1	-1	0	-1	0
	-1	-1	-1	0	-1	-1	-1	-1	-1	-1	-1	-1	
12	-1	-1	-1	-1	-1	-1	-1	0	-1	-1	-1	0	-1
	0	-1	-1	-1	0	-1	-1	-1	-1	-1	-1	-1	
13	-1	-1	-1	-1	-1	-1	-1	-1	0	-1	-1	-1	0
	-1	0	-1	-1	-1	0	-1	-1	-1	-1	-1	-1	
14	-1	-1	-1	-1	-1	-1	-1	-1	-1	0	-1	-1	-1
	0	-1	-1	-1	-1	-1	0	-1	-1	-1	-1	-1	
15	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	0	-1	-1
	-1	-1	-1	0	-1	-1	-1	0	-1	-1	-1	-1	
16	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	0	-1
	-1	-1	0	-1	0	-1	-1	-1	0	-1	-1	-1	
17	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	0
	-1	-1	-1	0	-1	0	-1	-1	-1	0	-1	-1	
18	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	0	-1	-1	-1	0	-1	0	-1	-1	-1	0	-1	
19	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	-1	0	-1	-1	-1	0	-1	-1	-1	-1	-1	100	
20	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	-1	-1	0	-1	-1	-1	-1	-1	0	-1	-1	-1	
21	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	-1	-1	-1	0	-1	-1	-1	0	-1	0	-1	-1	
22	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	-1	-1	-1	-1	0	-1	-1	-1	0	-1	0	-1	

23	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	-1	-1	-1	-1	-1	0	-1	-1	-1	0	-1	100	
24	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	-1	-1	-1	-1	-1	-1	0	-1	-1	-1	0	100	

Episode 0 (Initial Values - Q-Learning Value Matrix (Q))

S\A	0	1	2	3	4	5	6	7	8	9	10	11	12
	13	14	15	16	17	18	19	20	21	22	23	24	
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

Episode 1 - Q-Learning Value Matrix (Q)

S\A	0	1	2	3	4	5	6	7	8	9	10	11	12
	13	14	15	16	17	18	19	20	21	22	23	24	
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

Episode 10 - Q-Learning Value Matrix (Q)

S\A	0	1	2	3	4	5	6	7	8	9	10	11	12
	13	14	15	16	17	18	19	20	21	22	23	24	
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
1	100.0	0.0	0.0	0.0	0.0	0.0	53.144		0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	65.61	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

5	100.0	0.0	0.0	0.0	0.0	0.0	53.144		0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	0.0	90.0	0.0	0.0	0.0	0.0	0.0	59.049		0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	65.61	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
8	0.0	0.0	0.0	59.049		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	72.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	65.61	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
11	0.0	0.0	0.0	0.0	0.0	0.0	53.144		0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	59.049		0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	53.144		0.0	81.0	0.0	0.0	0.0	81.0	0.0	0.0	0.0	0.0	0.0
	0.0												
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	72.9	0.0	0.0	0.0	0.0	0.0	90.0	0.0	0.0	0.0	0.0	0.0	
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	72.9	0.0	0.0	0.0	0.0	0.0	90.0	0.0	0.0	0.0	90.0	0.0	
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	81.0	0.0	0.0	0.0	81.0	0.0	0.0	0.0	0.0	0.0	100.0	
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	81.0	0.0	0.0	
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	90.0	0.0	
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	81.0	0.0	0.0	0.0	81.0	0.0	100.0	
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

Episode 20 (Final Episode - Q-Learning Value Matrix (Q))

S\A	0	1	2	3	4	5	6	7	8	9	10	11	12
	13	14	15	16	17	18	19	20	21	22	23	24	
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
1	100.0	0.0	81.0	0.0	0.0	0.0	81.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2	0.0	90.0	0.0	72.9	0.0	0.0	0.0	72.9	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	0.0	0.0	81.0	0.0	65.61	0.0	0.0	0.0	65.61	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4	0.0	0.0	0.0	72.9	0.0	0.0	0.0	0.0	0.0	72.9	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	100.0	0.0	0.0	0.0	0.0	0.0	81.0	0.0	0.0	0.0	81.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
6	0.0	90.0	0.0	0.0	0.0	90.0	0.0	72.9	0.0	0.0	0.0	72.9	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

7	0.0	0.0	81.0	0.0	0.0	0.0	81.0	0.0	65.61	0.0	0.0	0.0	
	65.61	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	0.0	0.0	0.0	72.9	0.0	0.0	0.0	72.9	0.0	72.9	0.0	0.0	0.0
	72.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
9	0.0	0.0	0.0	0.0	65.61	0.0	0.0	0.0	65.61	0.0	0.0	0.0	0.0
	0.0	81.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
10	0.0	0.0	0.0	0.0	0.0	90.0	0.0	0.0	0.0	0.0	0.0	72.9	0.0
	0.0	0.0	72.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
11	0.0	0.0	0.0	0.0	0.0	0.0	81.0	0.0	0.0	0.0	81.0	0.0	
	65.61	0.0	0.0	0.0	65.61	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	72.9	0.0	0.0	0.0	72.9	0.0
	72.9	0.0	0.0	0.0	72.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	65.61	0.0	0.0	0.0	
	65.61	0.0	81.0	0.0	0.0	0.0	81.0	0.0	0.0	0.0	0.0	0.0	0.0
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	72.9	0.0	0.0	0.0
	72.9	0.0	0.0	0.0	0.0	0.0	90.0	0.0	0.0	0.0	0.0	0.0	
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	81.0	0.0	0.0
	0.0	0.0	0.0	65.61	0.0	0.0	0.0	65.61	0.0	0.0	0.0	0.0	
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	72.9	0.0
	0.0	0.0	72.9	0.0	72.9	0.0	0.0	0.0	72.9	0.0	0.0	0.0	
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	65.61	0.0	0.0	0.0	65.61	0.0	81.0	0.0	0.0	0.0	81.0	0.0	0.0
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	72.9	0.0	0.0	0.0	72.9	0.0	90.0	0.0	0.0	0.0	90.0	0.0	
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	81.0	0.0	0.0	0.0	81.0	0.0	0.0	0.0	0.0	0.0	100.0	
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	72.9	0.0	0.0	0.0	0.0	0.0	72.9	0.0	0.0	0.0	
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	65.61	0.0	0.0	0.0	65.61	0.0	81.0	0.0	0.0	
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	72.9	0.0	0.0	0.0	72.9	0.0	90.0	0.0	
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	81.0	0.0	0.0	0.0	81.0	0.0	100.0	
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

RL SARSA ALGORITHM:

SARSA Rewards Matrix (R)

S\A	0	1	2	3	4	5	6	7	8	9	10	11	12
	13	14	15	16	17	18	19	20	21	22	23	24	
0	100	0	-1	-1	-1	0	-1	-1	-1	-1	-1	-1	-1
	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
1	100	-1	0	-1	-1	-1	0	-1	-1	-1	-1	-1	-1
	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
2	-1	0	-1	0	-1	-1	-1	0	-1	-1	-1	-1	-1
	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
3	-1	-1	0	-1	0	-1	-1	-1	0	-1	-1	-1	-1
	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
4	-1	-1	-1	0	-1	-1	-1	-1	-1	0	-1	-1	-1
	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
5	100	-1	-1	-1	-1	-1	0	-1	-1	-1	0	-1	-1
	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
6	-1	0	-1	-1	-1	0	-1	0	-1	-1	-1	0	-1
	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
7	-1	-1	0	-1	-1	-1	0	-1	0	-1	-1	-1	0
	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
8	-1	-1	-1	0	-1	-1	-1	0	-1	0	-1	-1	-1
	0	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	

9	-1	-1	-1	-1	0	-1	-1	-1	0	-1	-1	-1	-1
	-1	0	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
10	-1	-1	-1	-1	-1	0	-1	-1	-1	-1	-1	0	-1
	-1	-1	0	-1	-1	-1	-1	-1	-1	-1	-1	-1	
11	-1	-1	-1	-1	-1	-1	0	-1	-1	-1	0	-1	0
	-1	-1	-1	0	-1	-1	-1	-1	-1	-1	-1	-1	
12	-1	-1	-1	-1	-1	-1	-1	0	-1	-1	-1	0	-1
	0	-1	-1	-1	0	-1	-1	-1	-1	-1	-1	-1	
13	-1	-1	-1	-1	-1	-1	-1	-1	0	-1	-1	-1	0
	-1	0	-1	-1	-1	0	-1	-1	-1	-1	-1	-1	
14	-1	-1	-1	-1	-1	-1	-1	-1	-1	0	-1	-1	-1
	0	-1	-1	-1	-1	-1	0	-1	-1	-1	-1	-1	
15	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	0	-1	-1
	-1	-1	-1	0	-1	-1	-1	0	-1	-1	-1	-1	
16	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	0	-1
	-1	-1	0	-1	0	-1	-1	-1	0	-1	-1	-1	
17	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	0
	-1	-1	-1	0	-1	0	-1	-1	-1	0	-1	-1	
18	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	0	-1	-1	-1	0	-1	0	-1	-1	-1	0	-1	
19	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	-1	0	-1	-1	-1	0	-1	-1	-1	-1	-1	100	
20	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	-1	-1	0	-1	-1	-1	-1	-1	0	-1	-1	-1	
21	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	-1	-1	-1	0	-1	-1	-1	0	-1	0	-1	-1	
22	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	-1	-1	-1	-1	0	-1	-1	-1	0	-1	0	-1	
23	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	-1	-1	-1	-1	-1	0	-1	-1	-1	0	-1	100	
24	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	-1	-1	-1	-1	-1	-1	0	-1	-1	-1	0	100	

Episode 0 (Initial Values - SARSA Value Matrix (Q))

S\A	0	1	2	3	4	5	6	7	8	9	10	11	12
	13	14	15	16	17	18	19	20	21	22	23	24	
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

Episode 1 - SARSA Value Matrix (Q)

S\A	0	1	2	3	4	5	6	7	8	9	10	11	12
	13	14	15	16	17	18	19	20	21	22	23	24	
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

Episode 10 - SARSA Value Matrix (Q)

S\A	0	1	2	3	4	5	6	7	8	9	10	11	12
	13	14	15	16	17	18	19	20	21	22	23	24	
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
1	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2	0.0	90.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
7	0.0	0.0	81.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	81.0	0.0	0.0	0.0	0.0	0.0	0.0	
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	90.0	0.0	
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	90.0	0.0	
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	

```
24    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
      0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0

Episode 61 (Final Episode - SARSA Value Matrix (Q))
S\A   0     1     2     3     4     5     6     7     8     9     10    11    12
      13    14    15    16    17    18    19    20    21    22    23    24
0     0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
      0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
1     100.0 0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
      0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
2     0.0   90.0  0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
      0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
3     0.0   0.0   81.0  0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
      0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
4     0.0   0.0   0.0   72.9  0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
      0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
5     100.0 0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
      0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
6     0.0   0.0   0.0   0.0   0.0   0.0   0.0   72.9  0.0   0.0   0.0   0.0   0.0
      0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
7     0.0   0.0   81.0  0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
      0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
8     0.0   0.0   0.0   0.0   0.0   0.0   0.0   72.9  0.0   0.0   0.0   0.0   0.0
      0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
9     0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
      0.0   65.61 0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
10    0.0   0.0   0.0   0.0   0.0   90.0  0.0   0.0   0.0   0.0   0.0   0.0   0.0
      0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
11    0.0   0.0   0.0   0.0   0.0   0.0   65.61 0.0   0.0   0.0   0.0   0.0   0.0
      0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
12    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   59.049
      0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0

13    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
      0.0   0.0   0.0   0.0   0.0   81.0  0.0   0.0   0.0   0.0   0.0   0.0
14    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
      72.9  0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
15    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   81.0  0.0   0.0
      0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
16    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
      0.0   0.0   0.0   0.0   72.9  0.0   0.0   0.0   0.0   0.0   0.0   0.0
17    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
      0.0   0.0   0.0   0.0   0.0   81.0  0.0   0.0   0.0   0.0   0.0   0.0
18    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
      0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   90.0  0.0
19    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
      0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   100.0
20    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
      0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   72.9  0.0   0.0   0.0
21    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
      0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   81.0  0.0   0.0
22    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
      0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   90.0  0.0
23    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
      0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   100.0
24    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
      0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0

RL DECAYING EPSILON-GREEDY ALGORITHM:
Decaying Epsilon-Greedy Rewards Matrix (R)
S\A   0     1     2     3     4     5     6     7     8     9     10    11    12
      13    14    15    16    17    18    19    20    21    22    23    24
0     100   0     -1    -1    -1    0     -1    -1    -1    -1    -1    -1    -1
      -1    -1    -1    -1    -1    -1    -1    -1    -1    -1    -1    -1
```

1	100	-1	0	-1	-1	-1	0	-1	-1	-1	-1	-1	-1
	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
2	-1	0	-1	0	-1	-1	-1	0	-1	-1	-1	-1	-1
	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
3	-1	-1	0	-1	0	-1	-1	-1	0	-1	-1	-1	-1
	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
4	-1	-1	-1	0	-1	-1	-1	-1	-1	0	-1	-1	-1
	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
5	100	-1	-1	-1	-1	-1	0	-1	-1	-1	0	-1	-1
	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
6	-1	0	-1	-1	-1	0	-1	0	-1	-1	-1	0	-1
	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
7	-1	-1	0	-1	-1	-1	0	-1	0	-1	-1	-1	0
	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
8	-1	-1	-1	0	-1	-1	-1	0	-1	0	-1	-1	-1
	0	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
9	-1	-1	-1	-1	0	-1	-1	-1	0	-1	-1	-1	-1
	-1	0	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	
10	-1	-1	-1	-1	-1	0	-1	-1	-1	-1	-1	0	-1
	-1	-1	0	-1	-1	-1	-1	-1	-1	-1	-1	-1	
11	-1	-1	-1	-1	-1	-1	0	-1	-1	-1	0	-1	0
	-1	-1	-1	0	-1	-1	-1	-1	-1	-1	-1	-1	
12	-1	-1	-1	-1	-1	-1	-1	0	-1	-1	-1	0	-1
	0	-1	-1	-1	0	-1	-1	-1	-1	-1	-1	-1	
13	-1	-1	-1	-1	-1	-1	-1	-1	0	-1	-1	-1	0
	-1	0	-1	-1	-1	0	-1	-1	-1	-1	-1	-1	
14	-1	-1	-1	-1	-1	-1	-1	-1	-1	0	-1	-1	-1
	0	-1	-1	-1	-1	-1	0	-1	-1	-1	-1	-1	
15	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	0	-1	-1
	-1	-1	-1	0	-1	-1	-1	0	-1	-1	-1	-1	
16	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	0	-1
	-1	-1	0	-1	0	-1	-1	-1	0	-1	-1	-1	
17	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	0
	-1	-1	-1	0	-1	0	-1	-1	-1	0	-1	-1	
18	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	0	-1	-1	-1	0	-1	0	-1	-1	-1	0	-1	
19	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	-1	0	-1	-1	-1	0	-1	-1	-1	-1	-1	100	
20	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	-1	-1	0	-1	-1	-1	-1	-1	0	-1	-1	-1	
21	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	-1	-1	-1	0	-1	-1	-1	0	-1	0	-1	-1	
22	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	-1	-1	-1	-1	0	-1	-1	-1	0	-1	0	-1	
23	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	-1	-1	-1	-1	-1	0	-1	-1	-1	0	-1	100	
24	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	-1	-1	-1	-1	-1	-1	0	-1	-1	-1	0	100	

Episode 0 (Initial Values - Decaying Epsilon-Greedy Value Matrix (Q))

S\A	0	1	2	3	4	5	6	7	8	9	10	11	12
	13	14	15	16	17	18	19	20	21	22	23	24	
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

Episode 1 - Decaying Epsilon-Greedy Value Matrix (Q)

S\A	0	1	2	3	4	5	6	7	8	9	10	11	12
	13	14	15	16	17	18	19	20	21	22	23	24	
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

Episode 10 - Decaying Epsilon-Greedy Value Matrix (Q)

S\A	0	1	2	3	4	5	6	7	8	9	10	11	12
	13	14	15	16	17	18	19	20	21	22	23	24	
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
1	100.0	0.0	81.0	0.0	0.0	0.0	81.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2	0.0	90.0	0.0	72.9	0.0	0.0	0.0	72.9	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	0.0	0.0	81.0	0.0	0.0	0.0	0.0	0.0	65.61	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4	0.0	0.0	0.0	72.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	81.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
6	0.0	72.9	0.0	0.0	0.0	90.0	0.0	72.9	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
7	0.0	0.0	81.0	0.0	0.0	0.0	81.0	0.0	65.61	0.0	0.0	0.0	
	65.61	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	0.0	0.0	0.0	72.9	0.0	0.0	0.0	72.9	0.0	59.049		0.0	0.0
	0.0	59.049		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0												
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	65.61	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
10	0.0	0.0	0.0	0.0	0.0	90.0	0.0	0.0	0.0	0.0	0.0	72.9	0.0
	0.0	0.0	72.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
11	0.0	0.0	0.0	0.0	0.0	0.0	81.0	0.0	0.0	0.0	65.61	0.0	
	65.61	0.0	0.0	0.0	65.61	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	59.049		0.0	0.0	0.0	
	72.9	0.0	59.049		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0											

```
13    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   65.61 0.0   0.0   0.0
      65.61 0.0   53.144      0.0   0.0   0.0   53.144      0.0   0.0   0.0   0.0
      0.0   0.0
14    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
      59.049      0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0

15    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   81.0  0.0   0.0
      0.0   0.0   0.0   53.144      0.0   0.0   0.0   65.61 0.0   0.0   0.0   0.0

16    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
      0.0   0.0   47.83 0.0   72.9  0.0   0.0   0.0   59.049      0.0   0.0   0.0

17    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
      65.61 0.0   0.0   0.0   65.61 0.0   0.0   0.0   0.0   0.0   81.0  0.0   0.0

18    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
      59.049      0.0   0.0   0.0   72.9  0.0   0.0   0.0   0.0   0.0   0.0   0.0

19    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
      0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   100.0
20    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
      0.0   0.0   72.9  0.0   0.0   0.0   0.0   0.0   59.049      0.0   0.0   0.0

21    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
      0.0   0.0   0.0   53.144      0.0   0.0   0.0   65.61 0.0   81.0  0.0   0.0

22    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
      0.0   0.0   0.0   0.0   72.9  0.0   0.0   0.0   0.0   0.0   90.0  0.0
23    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
      0.0   0.0   0.0   0.0   0.0   53.144      0.0   0.0   0.0   81.0  0.0
      100.0
24    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
      0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0

Episode 18 (Final Episode - Decaying Epsilon-Greedy Value Matrix (Q))
S\A   0     1     2     3     4     5     6     7     8     9     10    11    12
      13    14    15    16    17    18    19    20    21    22    23    24
0     0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
      0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
1     100.0 0.0   81.0  0.0   0.0   0.0   81.0  0.0   0.0   0.0   0.0   0.0   0.0
      0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
2     0.0   90.0  0.0   72.9  0.0   0.0   0.0   72.9  0.0   0.0   0.0   0.0   0.0
      0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
3     0.0   0.0   81.0  0.0   65.61 0.0   0.0   0.0   65.61 0.0   0.0   0.0   0.0
      0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
4     0.0   0.0   0.0   72.9  0.0   0.0   0.0   0.0   0.0   72.9  0.0   0.0   0.0
      0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
5     100.0 0.0   0.0   0.0   0.0   0.0   81.0  0.0   0.0   0.0   81.0  0.0   0.0
      0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
6     0.0   90.0  0.0   0.0   0.0   90.0  0.0   72.9  0.0   0.0   0.0   72.9  0.0
      0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
7     0.0   0.0   81.0  0.0   0.0   0.0   81.0  0.0   65.61 0.0   0.0   0.0
      65.61 0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0

8     0.0   0.0   0.0   72.9  0.0   0.0   0.0   72.9  0.0   72.9  0.0   0.0   0.0
      72.9  0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
9     0.0   0.0   0.0   0.0   65.61 0.0   0.0   0.0   65.61 0.0   0.0   0.0   0.0
      0.0   81.0  0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
10    0.0   0.0   0.0   0.0   0.0   90.0  0.0   0.0   0.0   0.0   0.0   72.9  0.0
      0.0   0.0   72.9  0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
11    0.0   0.0   0.0   0.0   0.0   0.0   81.0  0.0   0.0   0.0   81.0  0.0
      65.61 0.0   0.0   0.0   65.61 0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
```

```
12    0.0   0.0   0.0   0.0   0.0   0.0   0.0   72.9  0.0   0.0   0.0   72.9  0.0
      72.9  0.0   0.0   0.0   72.9  0.0   0.0   0.0   0.0   0.0   0.0   0.0
13    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   65.61 0.0   0.0   0.0
      65.61 0.0   53.144      0.0   0.0   0.0   81.0  0.0   0.0   0.0   0.0   0.0
      0.0
14    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   59.049      0.0   0.0
      0.0   59.049      0.0   0.0   0.0   0.0   0.0   90.0  0.0   0.0   0.0   0.0
      0.0
15    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   81.0  0.0   0.0
      0.0   0.0   0.0   65.61 0.0   0.0   0.0   65.61 0.0   0.0   0.0   0.0
16    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   72.9  0.0
      0.0   0.0   72.9  0.0   72.9  0.0   0.0   0.0   72.9  0.0   0.0   0.0
17    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
      65.61 0.0   0.0   0.0   65.61 0.0   81.0  0.0   0.0   0.0   81.0  0.0   0.0

18    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
      72.9  0.0   0.0   0.0   72.9  0.0   90.0  0.0   0.0   0.0   90.0  0.0
19    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
      0.0   81.0  0.0   0.0   0.0   81.0  0.0   0.0   0.0   0.0   0.0   100.0
20    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
      0.0   0.0   72.9  0.0   0.0   0.0   0.0   0.0   72.9  0.0   0.0   0.0
21    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
      0.0   0.0   0.0   65.61 0.0   0.0   0.0   65.61 0.0   81.0  0.0   0.0
22    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
      0.0   0.0   0.0   0.0   72.9  0.0   0.0   0.0   72.9  0.0   90.0  0.0
23    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
      0.0   0.0   0.0   0.0   0.0   81.0  0.0   0.0   0.0   81.0  0.0   100.0
24    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
      0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
c743h357@ENGR1005-07:~/EECS658/ChetanHiremath_Assignment8$
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