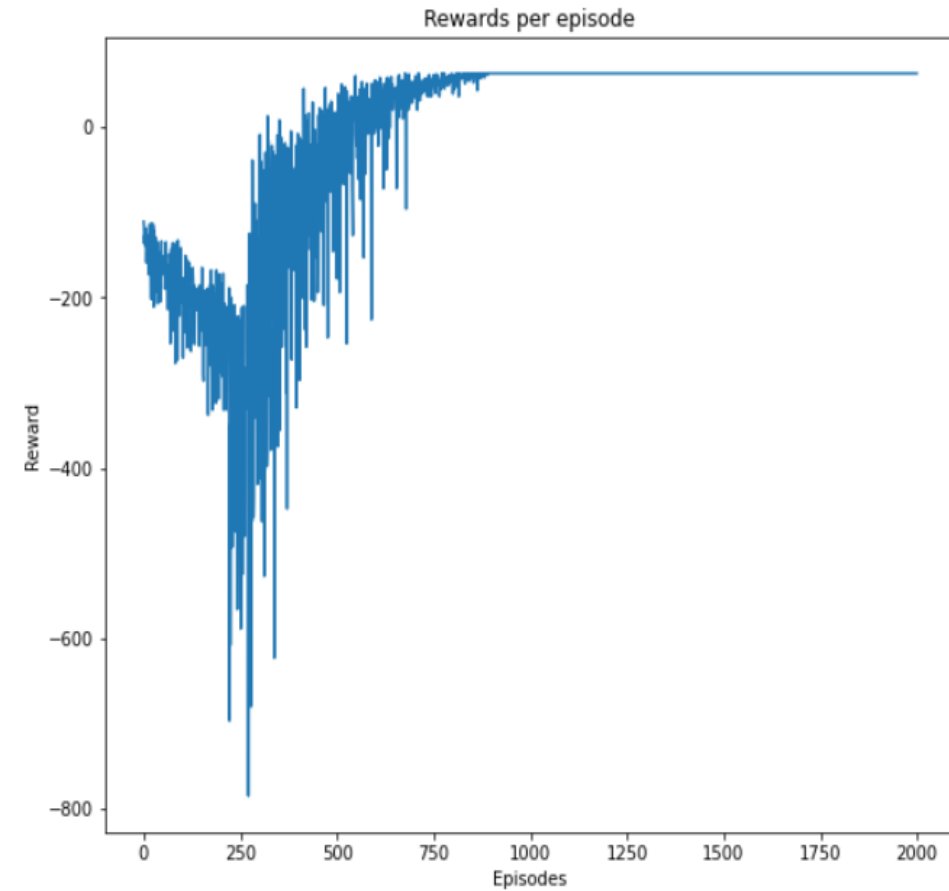
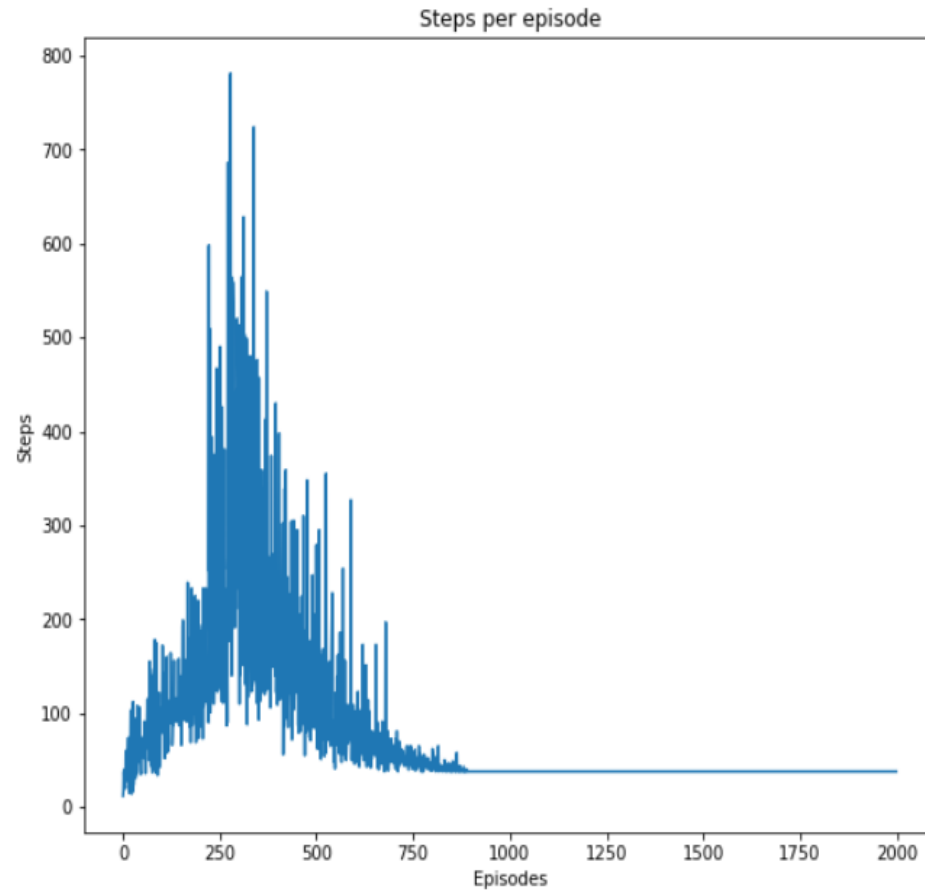
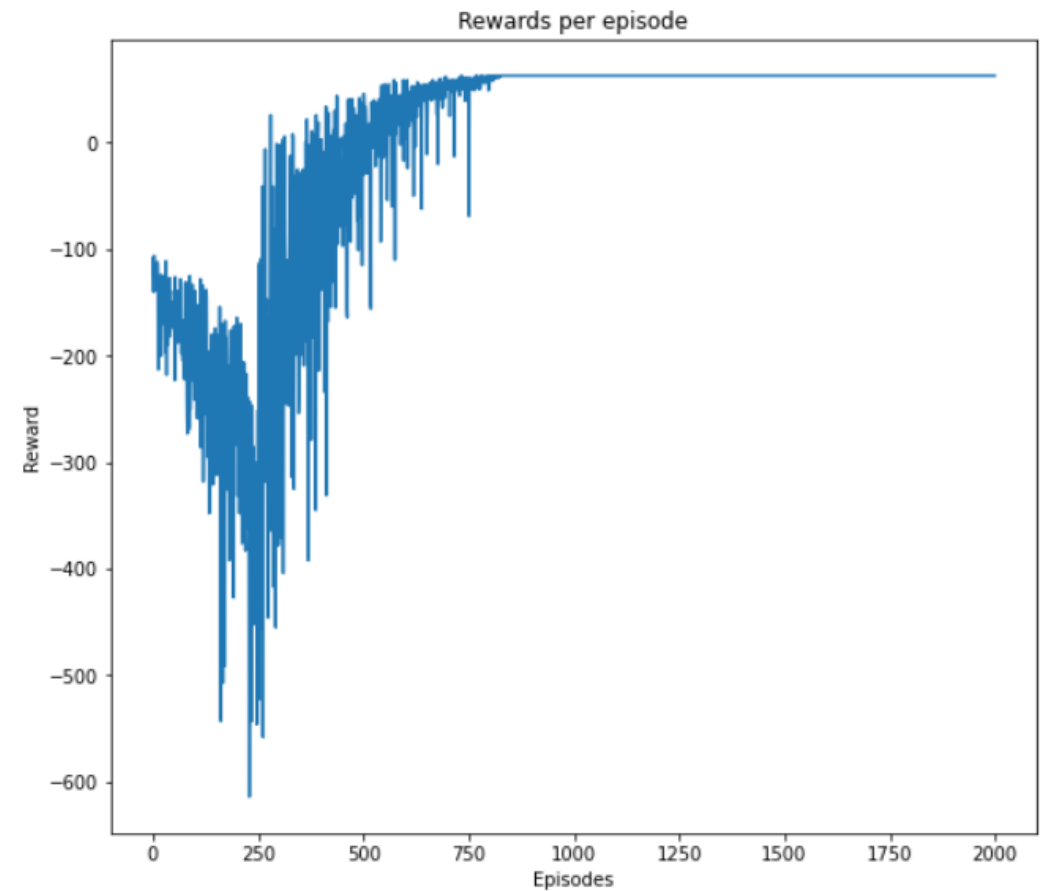
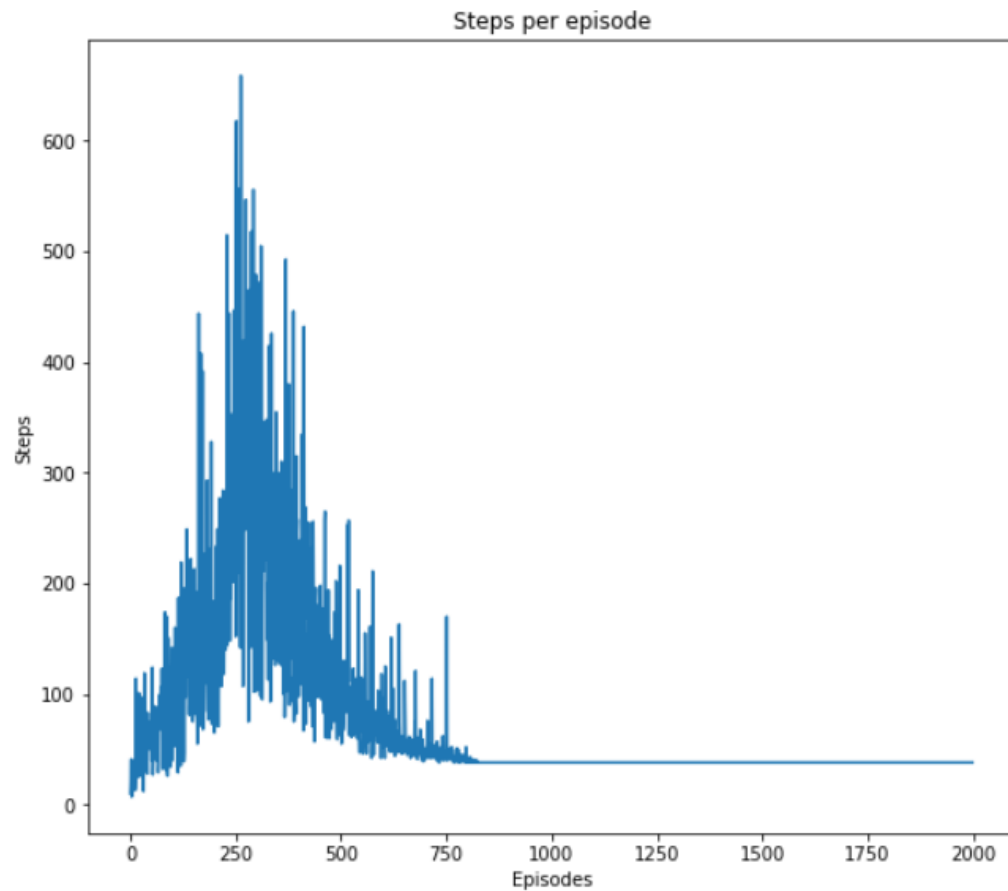


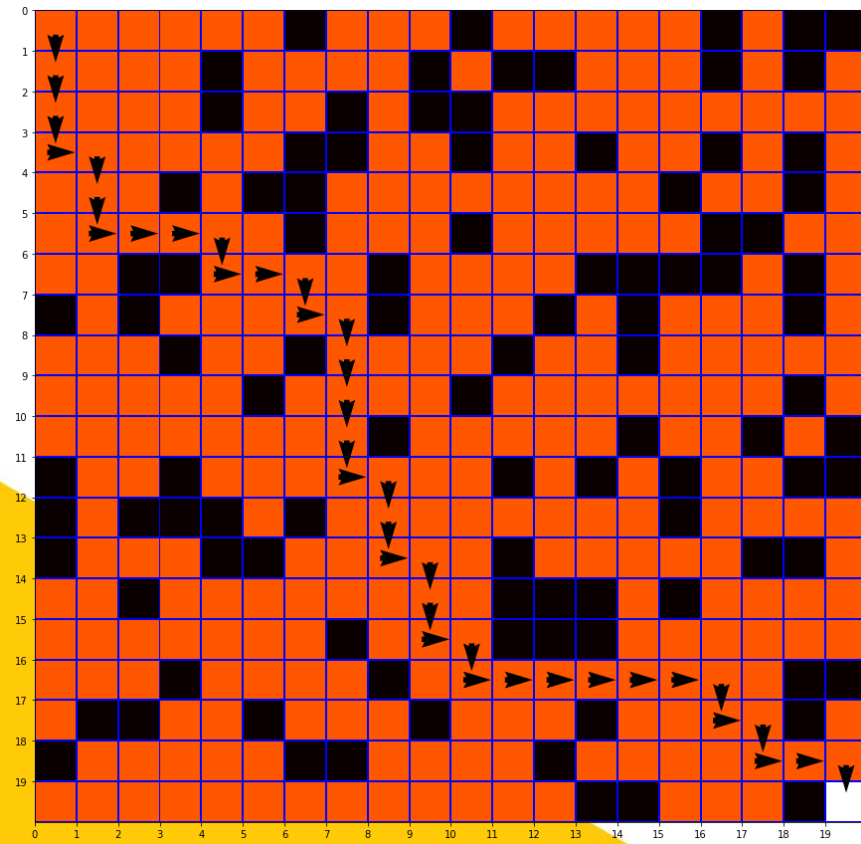
# Q-Learning VS SARSA



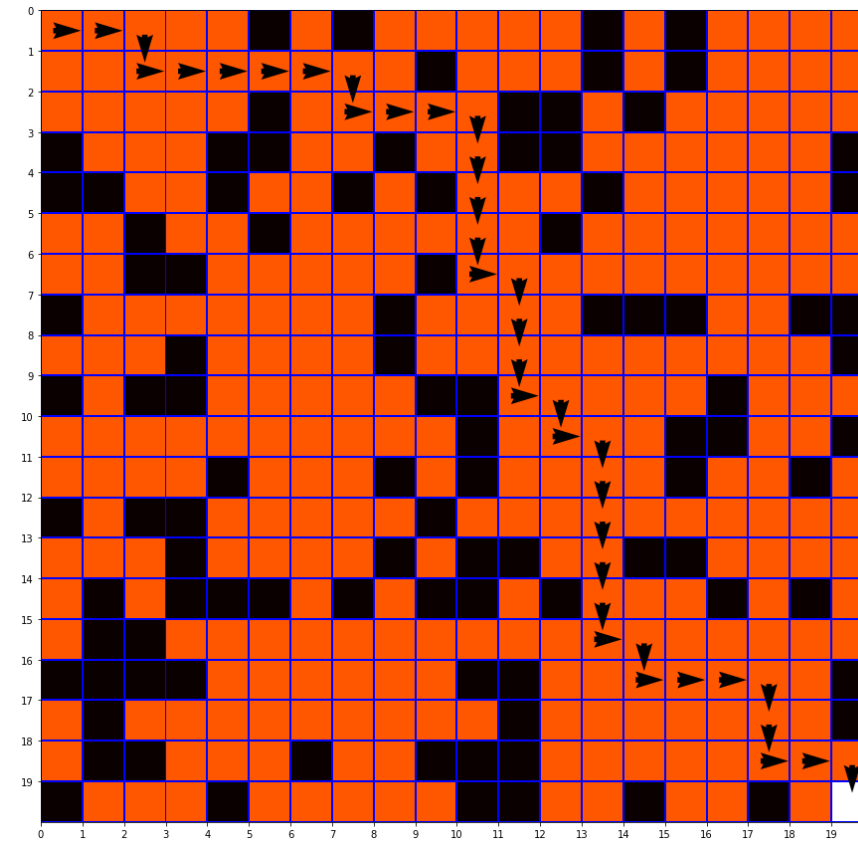
*Fig- Comparison graphs for Steps vs Episodes and Rewards vs Episodes for  $\epsilon=1.0$  in Q-Learning*



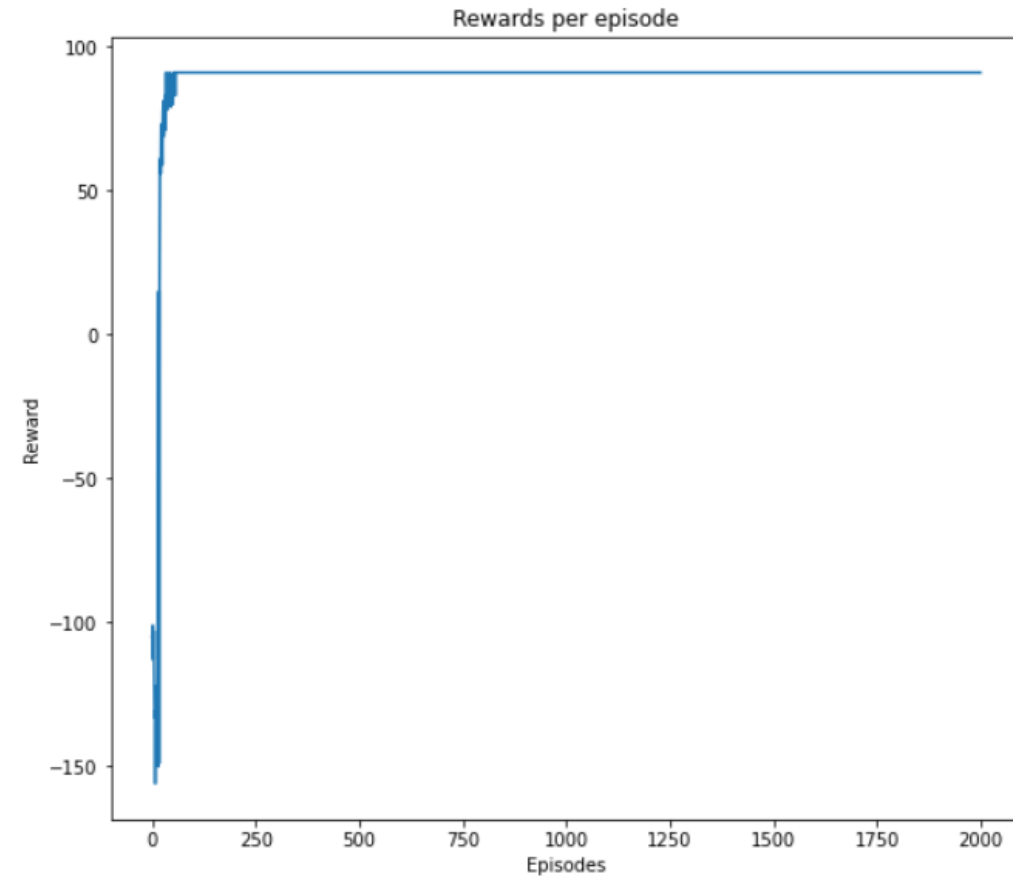
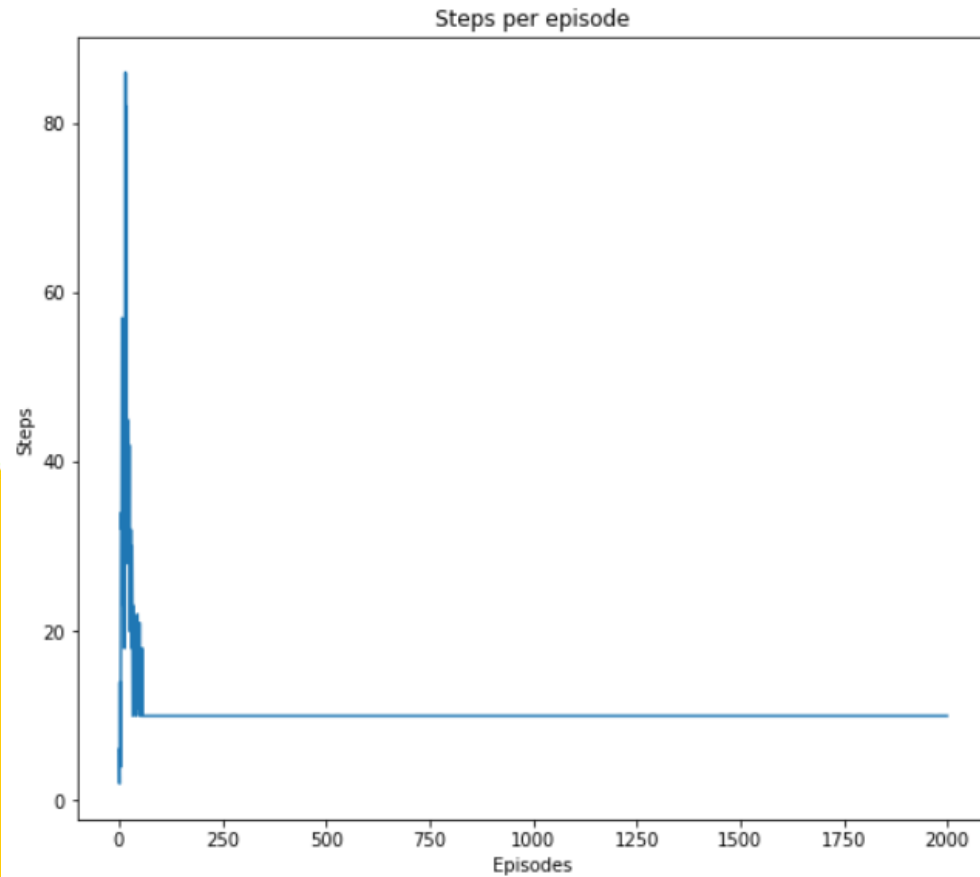
*Fig- Comparison graphs for Steps vs Episodes and Rewards vs Episodes for  $\epsilon=1.0$  in Sarsa*



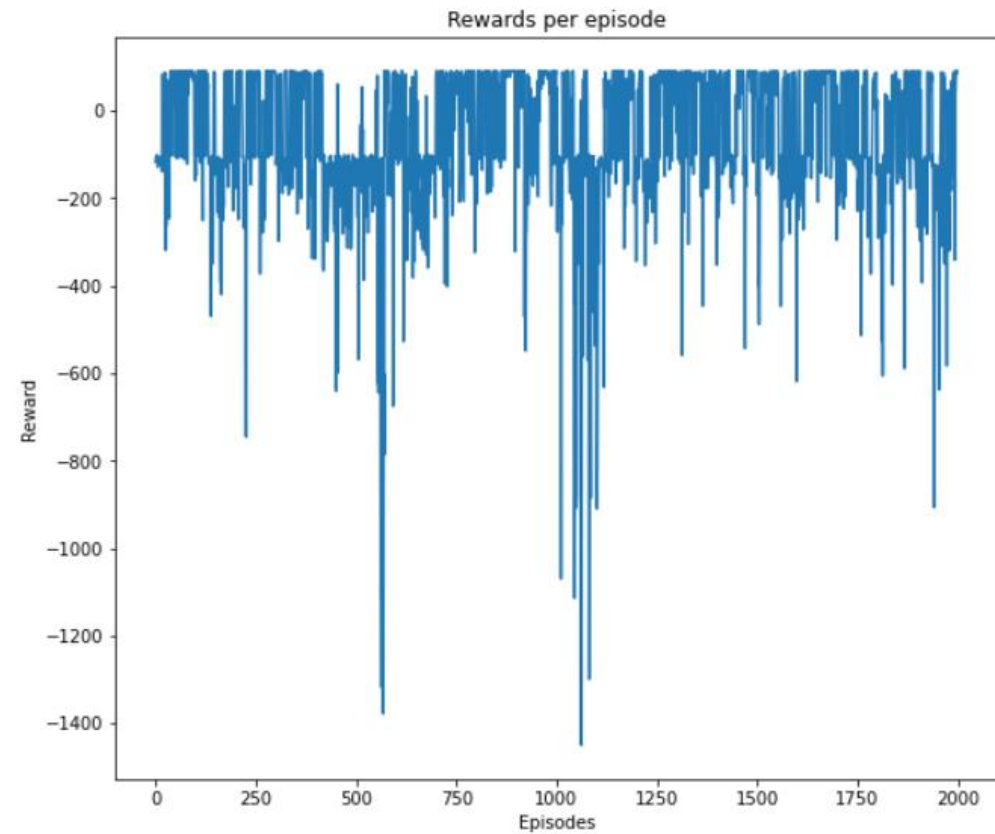
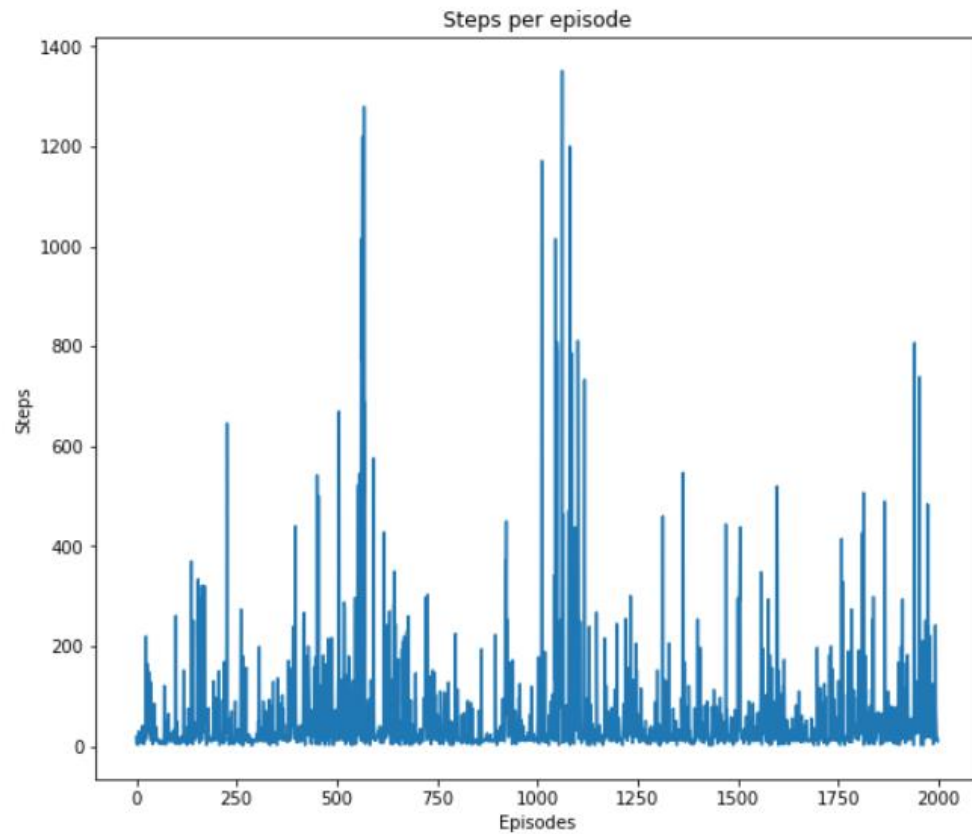
***Q-learning 1.0***



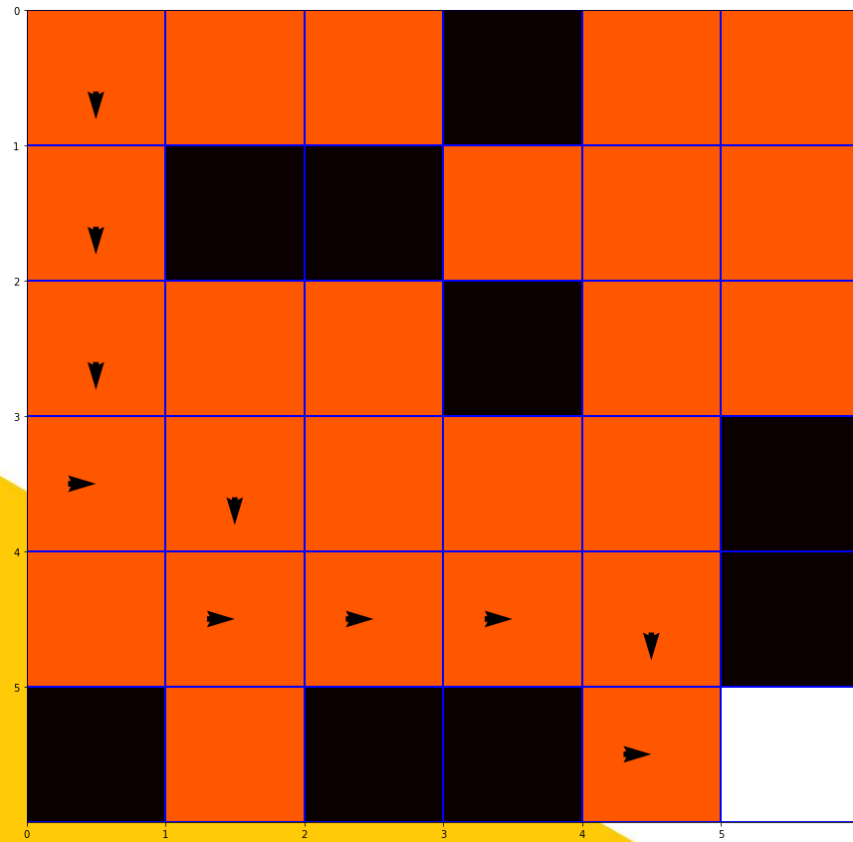
***SARSA 1.0***



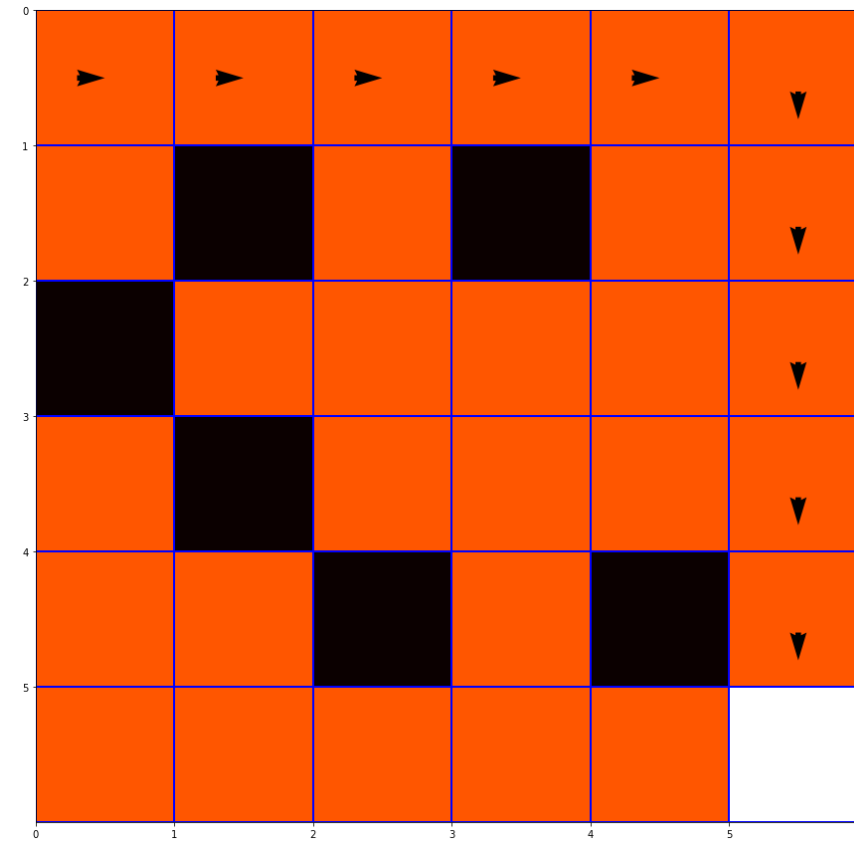
***Fig- Comparison graphs for Steps vs Episodes and Rewards vs Episodes for  $\epsilon=0.9$  in Q-Learning***



*Fig- Comparison graphs for Steps vs Episodes and Rewards vs Episodes for  $\epsilon=0.9$  in Sarsa*



***Q-learning 0.9***



***SARSA 0.9***

## Deep Q-learning Execution:

```
loading weights from file: model.h5
Model does not exist - starting from new model.
Epoch: 000/999 | Loss: 0.0177 | Episodes: 82 | Win count: 0 | Win rate: 0.000 | Time: 218.4 seconds
Epoch: 001/999 | Loss: 0.0073 | Episodes: 81 | Win count: 0 | Win rate: 0.000 | Time: 8.61 minutes
Epoch: 002/999 | Loss: 0.0040 | Episodes: 82 | Win count: 0 | Win rate: 0.000 | Time: 13.65 minutes
Epoch: 003/999 | Loss: 0.0029 | Episodes: 83 | Win count: 0 | Win rate: 0.000 | Time: 18.71 minutes
Epoch: 004/999 | Loss: 0.0018 | Episodes: 82 | Win count: 0 | Win rate: 0.000 | Time: 23.69 minutes
Epoch: 005/999 | Loss: 0.0155 | Episodes: 78 | Win count: 0 | Win rate: 0.000 | Time: 28.44 minutes
Epoch: 006/999 | Loss: 0.0251 | Episodes: 80 | Win count: 0 | Win rate: 0.000 | Time: 33.31 minutes
Epoch: 007/999 | Loss: 0.0316 | Episodes: 78 | Win count: 0 | Win rate: 0.000 | Time: 38.06 minutes
Epoch: 008/999 | Loss: 0.0025 | Episodes: 5 | Win count: 1 | Win rate: 0.000 | Time: 38.37 minutes
Epoch: 009/999 | Loss: 0.0250 | Episodes: 77 | Win count: 1 | Win rate: 0.000 | Time: 43.05 minutes
Epoch: 010/999 | Loss: 0.0404 | Episodes: 80 | Win count: 1 | Win rate: 0.000 | Time: 47.95 minutes
Epoch: 011/999 | Loss: 0.0050 | Episodes: 84 | Win count: 1 | Win rate: 0.000 | Time: 53.08 minutes
Epoch: 012/999 | Loss: 0.0347 | Episodes: 85 | Win count: 1 | Win rate: 0.000 | Time: 58.25 minutes
Epoch: 013/999 | Loss: 0.0023 | Episodes: 3 | Win count: 2 | Win rate: 0.000 | Time: 58.44 minutes
Epoch: 014/999 | Loss: 0.0037 | Episodes: 86 | Win count: 2 | Win rate: 0.000 | Time: 63.69 minutes
Epoch: 015/999 | Loss: 0.0029 | Episodes: 83 | Win count: 2 | Win rate: 0.000 | Time: 1.15 hours
Epoch: 016/999 | Loss: 0.0029 | Episodes: 82 | Win count: 3 | Win rate: 0.000 | Time: 1.23 hours
Epoch: 017/999 | Loss: 0.0098 | Episodes: 50 | Win count: 4 | Win rate: 0.000 | Time: 1.28 hours
Epoch: 018/999 | Loss: 0.0071 | Episodes: 13 | Win count: 5 | Win rate: 0.278 | Time: 1.29 hours
Epoch: 019/999 | Loss: 0.0235 | Episodes: 5 | Win count: 6 | Win rate: 0.333 | Time: 1.30 hours
Epoch: 020/999 | Loss: 0.0145 | Episodes: 6 | Win count: 7 | Win rate: 0.389 | Time: 1.30 hours
Epoch: 021/999 | Loss: 0.0217 | Episodes: 32 | Win count: 8 | Win rate: 0.444 | Time: 1.34 hours
Epoch: 022/999 | Loss: 0.0205 | Episodes: 5 | Win count: 9 | Win rate: 0.500 | Time: 1.34 hours
Epoch: 023/999 | Loss: 0.0135 | Episodes: 4 | Win count: 10 | Win rate: 0.556 | Time: 1.35 hours
Epoch: 024/999 | Loss: 0.0118 | Episodes: 11 | Win count: 11 | Win rate: 0.611 | Time: 1.36 hours
Epoch: 025/999 | Loss: 0.0040 | Episodes: 67 | Win count: 12 | Win rate: 0.667 | Time: 1.43 hours
Epoch: 026/999 | Loss: 0.0045 | Episodes: 4 | Win count: 13 | Win rate: 0.667 | Time: 1.43 hours
Epoch: 027/999 | Loss: 0.0052 | Episodes: 4 | Win count: 14 | Win rate: 0.722 | Time: 1.43 hours
Epoch: 028/999 | Loss: 0.0036 | Episodes: 12 | Win count: 15 | Win rate: 0.778 | Time: 1.45 hours
Epoch: 029/999 | Loss: 0.0038 | Episodes: 10 | Win count: 16 | Win rate: 0.833 | Time: 1.46 hours
Epoch: 030/999 | Loss: 0.0034 | Episodes: 9 | Win count: 17 | Win rate: 0.889 | Time: 1.46 hours
Epoch: 031/999 | Loss: 0.0015 | Episodes: 4 | Win count: 18 | Win rate: 0.889 | Time: 1.47 hours
Epoch: 032/999 | Loss: 0.0015 | Episodes: 5 | Win count: 19 | Win rate: 0.944 | Time: 1.47 hours
Epoch: 033/999 | Loss: 0.0028 | Episodes: 8 | Win count: 20 | Win rate: 1.000 | Time: 1.48 hours
files: model.h5, model.json
n_epoch: 33, max_mem: 1000, data: 50, time: 1.48 hours
```

