# Deep Q-Network Agent
Kung Fu Master: Agent Jackie

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### What Worked Well

- My buggy code in the start, although very bad, did give okay results- this helped me not feel that demotivated about it.
- Epsilon-greedy exploration strategy allowed balanced exploration and exploitation.
- The file `helper.py` which was already provided extracted features from raw pixel inputs, that was really helpful.

### What Didn't Work Well

Certain challenges and limitations were observed:

- My GPU wasnt working on WSL because of some stupid compatibility reasons, training on CPU-only setups was significantly slow, limiting the number of episodes completed by a huge margin.
- Epsilon decay implemented inside the training steps led to early convergence to low exploration rates, which required a lot of adjustment from me.

### How Agent Jackie Improved

Over training episodes, Agent Jackie showed improvement as measured by cumulative rewards:

- Initial episodes involved mostly random actions with low rewards.
- As training progressed, our beloved Agent Jackie learned to avoid immediate failures and started killing the pink goons without any damage taken (this made me very proud), but he was still getting owned by the guy with a gun.
- Slowly it started to figure out how to deal with the gun guy and we were done.

### How to See Agent Jackie Play

To see the trained agent's gameplay:

- Make sure the file `trained_agent.weights.h5` (or your latest saved weights) is present in the directory.
- In the terminal, execute:

  ```
  python evaluate.py
  ```

- A window will display the gameplay; you can press `Q` to quit at any time.
- The script will also print total rewards for each shown episode.

## Screenshots

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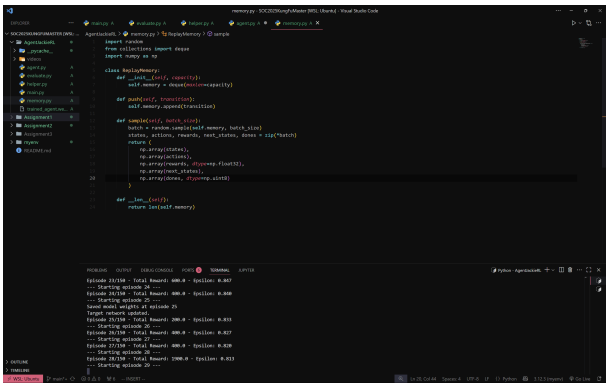

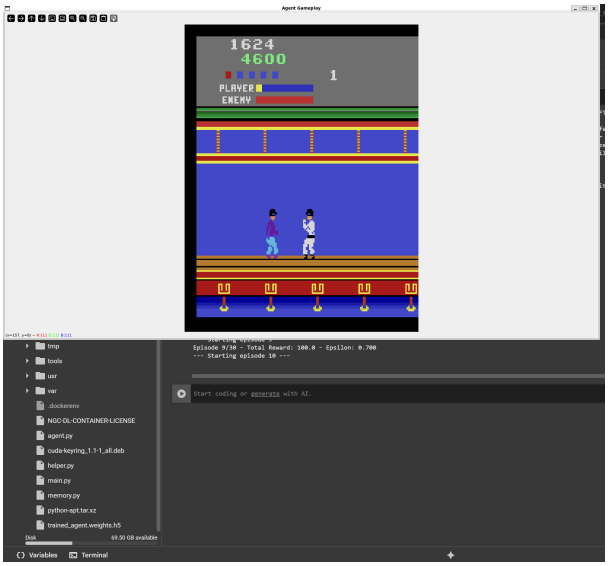


Figure 1: Tried using google Colab since my gpu wasnt working but it wasn't significantly faster