State Selection using Reinforcement Learning

* Agent trained from dataset, then presented with new choices to make decisions on its own
* Requires an initial state of main story, and different scenarios with multiple choices that will affect future choices and states in others scenarios
* Sentiment analysis , a natural language processing method, can be used as aid in the textual analysis or computational linguistic to identify and quantify states and subject such as choices.
* Reinforcement learning will be used to create an agent that will be trained on known states with positive, negative, or neutral values which would enable the agent to make future predictions or decisions on never seen states.

Introducing Finite State Machines to Automate NPCs

* A finite state model written to fully automate NPCs task.
* Consist of an initial state, idle state, and an action state that can simulate behaviors are transitions.
  + Ex. Developing enemies with automated task and can attack players if seen.
  + NPCs with specific task and allows them to communicate to their group if something occurs.

Fully Automated NPC using Reinforcement Learning (May take a long time)

* Agents trained on simulations which can automate NPC’s movements, choices, and state.
* Creating a setting where NPCs behave like humans to satisfy needs like hunger, thirst, and energy. Ultimately having NPCs having to act on their own without any instructions.
* Giving NPCs special skills and traits which would allow the agents to force the NPC to specialize or concentrate on a particular job or position to get the best result for the RL model.
  + Ex. Replicating the supply and demand:
    - NPCs gather to satisfy the basic needs. Some NPCs special skills or traits will allow the NPC to collect more than they need, therefor collecting extra resources. The NPC will then be able to trade or sell these resources
    - Trader NPCs will be able to buy and sell based on the supply and demand of the market. If the traders are not able to particular items, they must lower the price to be able to sell the items. If the supply is low and demand high, these NPC should automatically increase prices.
    - Outside factors can affect the flow of these NPCs such as player behaviors, other NPCs behaviors, or environmental behaviors.
  + Income inequality can be naturally added as some NPCs will have better skills that allows them to make more money or allowing the model to accumulate better scores.
    - We can study the distribution of wealth, inequality, and productivity.
    - Environmental variability such as a tax system, drought, or any hardships can be introduced to see its effects on the economy