

PRACTICE MATERIAL FOR SPELLATHON

(GRADE 13)

1. Develop a Machine Learning Simulation

Task: Create a simple simulation that demonstrates basic machine learning concepts, such as classification.

Steps:

1. Use sprites to represent different categories (e.g., shapes or colors).
2. Allow users to input data points (like clicking on a sprite).
3. Implement a basic algorithm to classify the data based on user input (e.g., K-nearest neighbors).
4. Visualize classification results using different colors for each category.
5. Allow users to retrain the model with new data points.

2. Create a Complex Game with Dynamic AI

Task: Build a game where players can compete against AI opponents that adapt to their strategies.

Steps:

1. Design a game environment (e.g., a racing or strategy game).
2. Implement player controls using keyboard inputs.
3. Use algorithms to create AI opponents that change behavior based on player actions (e.g., aggressive vs. defensive).
4. Track player and AI scores using variables.
5. Include levels of difficulty that affect AI strategy and behavior.

3. Build a Virtual Reality Tour

Task: Create an interactive tour that guides users through a virtual space (e.g., historical site, museum).

Steps:

1. Design multiple backdrops representing different locations.
2. Use sprites to represent navigational buttons (e.g., "Next," "Previous").
3. Implement "ask" blocks for user inputs to select areas of interest.
4. Use "if" statements to provide information and visual aids about each location.

5. Incorporate animations or sound effects to enhance the experience.

4. Create an Interactive Art Program

Task: Develop a program that allows users to create digital artwork with various tools and effects.

Steps:

1. Design a canvas backdrop and create tool sprites (e.g., brush, eraser, shapes).
2. Implement drawing functionality using the pen extension.
3. Allow users to select colors and brush sizes through "ask" blocks.
4. Use variables to track the current tool and color selection.
5. Add features like saving artwork or undoing actions.

5. Build a Social Impact Simulation

Task: Create a simulation that explores social issues (e.g., climate change, public health).

Steps:

1. Design a backdrop representing the environment or community being affected.
2. Use sprites to represent various factors (e.g., factories, trees, health resources).
3. Implement algorithms that simulate changes based on user decisions (e.g., reducing pollution, investing in healthcare).
4. Use variables to track the impact of choices on the environment or community health.
5. Provide feedback and statistics to the user about the effects of their decisions over time.