Intro to Python

Exercise: Ice/Water/Steam 2

Assignment

Ice/Water/Steam 2

This exercise is designed to help you practice implementing simple state machines using decision control structures (if/elif/else).

You must have completed the Ice/Water/Steam 1 exercise first. Make a copy of that code (all of the .py files) into this folder.

In this program, there are only 3 buttons: 1 to apply coolant to the beaker, 1 to apply heat to the beaker, and 1 to quit.

If the water is already ice: the coolant doesn’t make any change, the heat melts it to water, and quit ends the “game”.

If the water is already liquid: the coolant makes it ice, the heat makes it steam, and quit ends the “game”.

If the water is already steam: the coolant makes it water, the heat has no effect, and quit ends the “game”.

If you view “iws-state-diagram.jpg” you will see a pictorial representation of these state changes.

Tasks

• Edit “iwsdata.py” to change the ACTION constants to match the 3 actions we currently have.

• Edit “iws_data.py” to change the buttons created to be the 3 required, and to space them out nicely in a line.

• Edit “iws_data.py” to change the applyAction() function to make the correct state change for each possible initial state and action combination. I recommend that you make a separate function for each of the 4 possible input states.

Additional Tasks

• Add additional states; in “freezing”, the water is part liquid and part solid; in “boiling”, the water is part liquid and part gas.
• Add a laboratory scene to the background.
• Show a fire or Bunsen burner underneath the steam beaker.
• Show condensation on the outside of the beaker when the ice is present.
• Embellish your pictures to make them more interesting.
• Can you make photo-realistic images?
• Can you make other state machine diagrams for other systems and implement programs to draw them?

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