

# CSCI 210 Homework 2

*Assigned:* Wednesday, February 29, 2012

*Due Date:* Friday, March 16, 2012

*Due Time:* 11:59 pm

## Purpose

This assignment focuses on:

- Programming in Python
- Understanding States and Actions
- Designing a State Machine to describe behavior in a game
- Implementing a State Machine
- Programming to an interface

This is an individual assignment. You **must** work on your own. You may contact the instructor if you have difficulty with the assignment. **Start early** so you may ask for help in class, if you run into any problems.

## Assignment

Two python files, *Tamagochi.py* and *TamagochiGame.py* are available on the class website. The *Tomogachi.py* file defines the behavior of a pet, while the *TamagochiGame.py* runs a simple game loop asking for the user to either give food to the Tamagochi, or add or remove a toy. The loop runs once a second, changing the state of the Tamagochi and having the Tamagochi act. Every five seconds, the user is asked to add food, a toy, do nothing or quit.

Download the two files, and test to make sure they work by running *TamagochiGame.py*. From IDLE, this can be done by opening the file and running it (F5 key). From the command line, you can type *python TamagochiGame.py*. You should be asked to enter a letter every five seconds.

You are to create a Tamagochi (virtual pet) by modifying the *Tamagochi.py* file. The Tamagochi will exhibit the following behavior:

The Tamagochi is a simple virtual pet, which you can feed and let play with a toy. The Tamagochi has a certain level of nutrition between 0 and 100. Whenever there is food available, the Tamagochi will want to eat, raising its nutrition. If nutrition falls below 25, the Tamagochi will be hungry. If the Tamagochi is not hungry, and there is no food in the cage, it will get bored. If a toy is in the cage and the Tamagochi is not hungry, the Tamagochi will play. If the Tamagochi is hungry, it will refuse to play, even if there is a toy in the cage. If the Tamagochi gets hungry while playing, it will stop playing until fed. Essentially, the Tamagochi behaves according to (a minimal version of) Maslow's Hierarchy.

Your Tamagochi exists in a Space which contains a certain amount of food and may have a toy at any given time. You cannot modify the Space, but there are three methods available which describe the state:

`game.seeFood()` - Returns True if there is food in the Space, False if there is no food.

`game.seeToy()` - Returns True if there is a toy in the Space, False if there is no toy.

`game.eat()` - Your Tamagochi consumes a certain amount of food. This method returns the amount your Tamagochi consumes (as an integer), which you can add to the Tamagochi's *nutrition*.

You should call these methods during the `updateTamagochiState` and `tamagochiAct` methods, based on the current state.

In the `updateTamagochiState` method, add a command which reduces the nutrition by 3. However, the nutrition should never go below 0, so set nutrition to 0 if it is negative.

**NOTE:** `updateTamagochiState` should *only* change the `tamagochiState` variable, not perform *any* specific action (eating, for instance). Actions (eating, playing, etc.) should only be performed in the `tamagochiAct` method.

For this assignment, you must do the following:

1. Identify the different states the Tamagochi can be in, and which actions the Tamagochi can take.
2. Create a State Machine (as describe in class, and in Chapter 10 of the book), showing the transition between States.
3. Modify the *Tamagochi.py* file so that the Tamagochi's behavior matches the State Machine from part 2.

## Submission

1. Bring a copy of the states, actions and state machine you created for parts 1 and 2.
2. Submit the python file (*Tamagochi.py*) to Homework 2 in the dropbox.

## Assessment

Your grade will be based on how well you followed the above instructions. Each of the three items in the homework will have equal weight. The Tamagochi's State Machine and program should mimic the behavior described. If you are unclear as to how the Tamagochi should behave, please ask for clarification (in class, preferably).

Late assignments will be deducted 10% per day late.