

CS106 W19 - Assignment 03

Due: Friday, January 25, 11:59 PM

This assignment about “Input and Output”. These topics were in class on the week of January 21st. If you need to refresh yourself, review the slides that were presented in class and the demo code examples that were provided. They are both on LEARN.

QUESTION ONE (20% of A03) Bricolage

This is an open-ended question in which you can draw whatever you want (satisfying a few basic requirements). You must then support saving the contents of the sketch window to both a PNG image and a PDF illustration.

Write a sketch that creates an interesting picture in the sketch window. You must meet these minimum requirements:

1. Use each of the following built-in functions at least once: `text()`, `line()`, `ellipse()`, and `rect()`.
2. Use at least one external raster image imported using the `loadImage()` function and displayed using `image()`. These files normally end in `.png` or `.jpg`.
3. Use at least one external SVG illustration imported using the `loadShape()` function and displayed using `shape()`. You can use `cow.svg` or a different `svg`.
4. The sketch must include a `keyPressed()` function. When the user presses the 'r' key, the sketch should save the contents of the sketch window to an external image file named `output.png`. When the user presses the 'v' key, the sketch should save the contents of the sketch window to an external illustration named `output.pdf`.

Name your solution `A03Q01`.

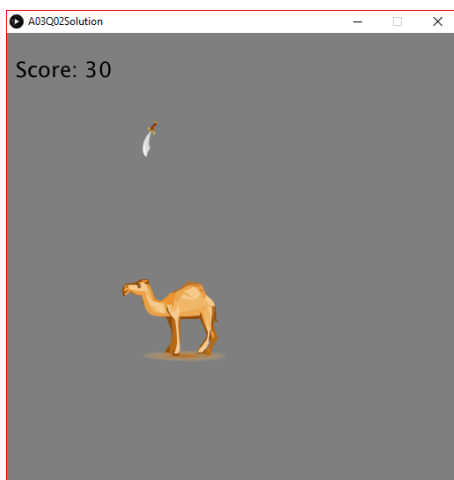
QUESTION TWO (80% of A03) Animations

The last question in Lab 03 used sprite sheets `camel.png`, `cobra.png`, `carpet.png`, and `chest.png`.

You are to create a game. The game is shown in the following YouTube video: https://youtu.be/tvkbVP_T1sw

The following are the requirements of the game:

1. The game must start with the camel continuously animating from right to left.
2. The sword must continuously drop from top to bottom.
3. If the sword hits the camel the player gets 10 points.
4. The score (i.e. points) must be displayed near the top of the screen.
5. If the player presses the UP Arrow key the camel speeds up. If the player presses the DOWN arrow key the camel slows down.
6. If the user presses 'b' the camel changes to a cobra. If the user presses 'c' the camel changes to a carpet. If the user presses 'd' the camel changes to a chest. If the user presses 'a' the camel image is shown.
7. In the starter code, only 4 frames of the animation are shown. Modify the code so that all 14 frames of the animation are shown. This may be the most difficult part of the assignment. Do it last.



The starter code is on the next page.

```

PImage img;
int[] sX = new int[16];
int[] sY = new int[16];
int frameIndex = 0;
int xPos;
// The following variable names were chosen based
// on slide 28 this week. It shows:
// copy( img, sx, sy, sw, sh, dx, dy, dw, dh );
int sW = 128;
int sH = 128;
int dW = sW;
int dH = sH;

void setup()
{
  size(512, 512);
  xPos = width;
  frameRate(18);
  img = loadImage("camel.png");
  int index=0;
  for (int c = 0; c < 4; c++) {
    sX[index] = (c * sW);
    sY[index] = 0;
    index++;
  }
}

void draw() {
  background(127);

  copy(img, sX[frameIndex], sY[frameIndex],
    sW, sH,
    xPos, height / 2,
    dW, dH);
  xPos -= 3;
  if (xPos < 0 - dW) {
    xPos = width;
  }

  frameIndex = (frameIndex + 1) % (4);

  fill(0);
  stroke(0);
  textSize(24);
  text("Current Frame Index is: " + frameIndex, 10, 50);
}

```

There is starter code on the next page for detecting the UP arrow and DOWN arrow presses.

```
    if (key == CODED) {
        if (keyCode == UP) {
// Add code to increase the speed here.
        } else if (keyCode == DOWN) {
// Add code to reduce the speed here.
        }
    }
}
```

Requirements and Grading

QUESTION ONE: (8 marks)

[4 marks] Correctness

- The sketch must meet the requirements listed above.

[2 marks] Coding Style

- Comment your code appropriately. Avoid superfluous comments.
- Correctly and consistently indent your code blocks.
- Use correct inline spacing in function calls, function definitions, and variable declaration and assignment.
- Use good line spacing to chunk sections of your code.
- Pay special attention to inline spacing for your conditional statements

One or more marks may be deducted for solutions that have obvious inefficiencies.

- Variables that are declared or assigned, but not used.
- Unnecessarily repeating the same code in multiple places.

[2 marks] Visual Design and Creativity

- Higher marks will be given to sketches with extra details for creativity and artistic appeal.

QUESTION TWO: (32 marks plus possibility of bonus marks)

[28 marks] Correctness

- The sketch must meet the requirements listed above.

[4 marks] Coding Style

- Comment your code appropriately. Avoid superfluous comments.
- Correctly and consistently indent your code blocks.
- Use correct inline spacing in function calls, function definitions, and variable declaration and assignment.
- Use good line spacing to chunk sections of your code.
- Pay special attention to inline spacing for your conditional statements

One or more marks may be deducted for solutions that have obvious inefficiencies.

- Variables that are declared or assigned, but not used.
- Unnecessarily repeating the same code in multiple places.

[bonus]

Bonus marks may be given to sketches with extra details for creativity and artistic appeal

Submitting

Create a folder “A03_username”, but replace “username” with your UW id. So if your email is “jac926@edu.uwaterloo.ca” you would create a folder “A03_jac926”.

SAVE your sketches in that folder as “A03Q01_username” and “A03Q02_username”. Again, replace username with your UW id.

Zip your “A03_username” folder (with “username” replaced by your UW id) and submit it the correct assignment dropbox.

It is your responsibility to submit to the correct dropbox with the correct files before the deadline. Otherwise you will have marks deducted.

Academic Integrity

All assignments in CS106 are done individually. Group work and sharing of code is not allowed.

Detecting Plagiarism:

- We monitor Reddit, File Trading Sites, past year CS106 assignments, etc.
- Measure Of Software Similarity (MOSS)
 - automatic system for determining the similarity of code

Discipline

- Discipline (Policy 71)
 - <https://uwaterloo.ca/secretariat-general-counsel/policies-procedures-guidelines/policy-71>