CS 106 Winter 2019

Lab 06: Midterm Review

The questions in this lab will be useful as practice for the midterm.

This lab contains exercises that are useful for practice for the midterm.

SAVE each sketch as "L06Q01", "L06Q02", etc.

QUESTION ONE

Write a function called intIdentity() that takes a single integer as an argument and returns that

integer.

```
int result;
int myInt = 99;

void setup() {
  result = intIdentity(myInt);
  println(result);
}
```

With the above starter code and your function `intIdentity()` the program above should print
99.

QUESTION TWO

Write a function called boolIdentity() that takes a single boolean as an argument and returns that Boolean.

```
boolean result;
boolean myBool = true;

void setup() {
  result = boolIdentity(myBool);
  println(result);
}
```

With the above starter code and your function `boolIdentity()` the program above should print true.

QUESTION THREE

Write a function called isEven() that takes a single int as an argument and returns a Boolean. The Boolean is true if the int is even and false otherwise.

```
boolean result;
int myInt = 99;

void setup() {
  result = isEven(myInt);
  println(result);
}
```

With the above starter code and your function `isEven()` the program above should print true if myInt is 66 and should print false if myInt is 99.

QUESTION FOUR

Write a function called hasZero() that takes an array of int as an argument and returns a single Boolean. The Boolean is true if the array contains at least one zero and false otherwise.

```
boolean result;
int[] myArr = {2, 9, 0, 6, 8, 6};

void setup() {
  result = hasZero(myArr);
  println(result);
}
```

With the above starter code and your function `hasZero()` the program above should print true as there is one zero in the array.

QUESTION FIVE

Run the following code to see the result. Add comments to the code to explain what the code does.

```
String str = "1 two 3 FOUR 5";
println( int( splitTokens( str )[2] ) );
```

QUESTION SIX

Run the following code to see the result. Add comments to the code to explain what the code does.

```
String str = "PANCAKES!";
for ( int idx = 0; idx < str.length(); idx += 2 ) {
  println( str.charAt( idx ) );
}
```

QUESTION SEVEN

Run the following code to see the result.

a) Modify the code so that the following lines are moved from setup() to be in a constructor in the Circle class. You may have to modify the lines of code slightly.

```
circle.x = random(0, width);
circle.y = random(0, height);
fill(random(0, 255));
```

b) Add comments to the code to explain what the code does.

c) Add a move() method in the CircleClass to move the circle to a new random location. Then modify draw to add the line: circle.move()

```
Circle circle;

void setup() {
  circle = new Circle();
}

void draw() {
  background(200);
    circle.x = random(0, width);
    circle.y = random(0, height);
    fill(random(0, 255));
  circle.display();
}

class Circle {

  float x;
  float y;

  void display() {
    ellipse(x, y, 30, 30);
  }
}
```

QUESTION EIGHT

Write a program to do the following. There is no starter code.

Display a 30x30 rectangle on the sketch window in a random location.

Create a hit test so that every time the user presses the mouse while the mouse is on the rectangle, the rectangle changes to a random color.

If the user presses the mouse and the mouse is NOT on the rectangle then nothing happens.

You'll probably want at least three functions:

       setup()

       draw()

       mousePressed()

QUESTION NINE

Write a function manipulateArray() that takes an array of int as input and does the following:

Concatenates the array onto itself so an array {1, 2, 3} becomes {1, 2, 3, 1, 2, 3}.

Shorten the array so that it only contains {1, 2, 3, 1, 2}.

Reverse the array so it becomes {2, 1, 3, 2, 1}.

Return the new created array {2, 1, 3, 1, 2}.

```
void setup() {
   int[] arr = {1, 2, 3};
   int result[];
   result = manipulateArray(arr);
   println(result);
}
```

With the above code and your function manipulateArray() the result would be as follows:

[0] 2

[1] 1

[2] 3

[3] 2

[4] 1

Submission

Submit all sketch directories from this lab as one ZIP file called L07.zip to the lab dropbox on Learn.

It is your responsibility to submit to the correct dropbox with the correct files before the deadline. Otherwise you will receive a mark of 0.