Lecture 5: Variables Worksheet **Solutions**

1) Open Processing and type in the following lines, each of which contains an error. Processing will warn you about the error in a red bar towards the bottom of the window. Write down the error message associated with each line:

Code	Error Message
`x = 0.5;`	The variable "x" does not exist
`int x = 0.5;`	Type mismatch, "float" does not match with "int"
`float y = 0.5`	Missing a semicolon ";"

2) For the following sequence of code, indicate the variable values after each statement is executed (*i.e.* this is one program, but we are pausing after each statement to observe the current variable values). If a variable value doesn't exist, then write "n/a".

Code	Variable Values After Execution
`int x = 1;`	`// x = __1__ , y = _n/a_ , z = _n/a_`
`int y = 2;`	`// x = __1__ , y = __2__ , z = _n/a_`
`int z = 3;`	`// x = __1__ , y = __2__ , z = __3__`
`x = z;`	`// x = __3__ , y = __2__ , z = __3__`
`z = 5;`	`// x = __3__ , y = __2__ , z = __5__`
`x = y + 2;`	`// x = __4__ , y = __2__ , z = __5__`
`y = y - 3;`	`// x = __4__ , y = _-1__ , z = __5___`
`z = x + y;`	`// x = __4__ , y = _-1__ , z = __3__`

3) The `max()` command returns the larger of two values, while `min()` returns the smaller of two values. For the following values of `int x` and `int y`, what do the shown commands return?

x	`max(0, x);`
10	10
5	5
0	0
-5	0

y	`min(200, y);`
190	190
195	195
200	200
205	200

4) Type the following code into a new Processing file and then press Play.

```
int x = 120;
println(x);
```

Notice that an empty canvas appears and the value of `x` gets printed to the console. You can use the `println()` function to double-check your answers to questions 2 and 3.

5) Type the following code into a new Processing file and then press Play.

```
int houseX = 250;
void setup() {
  size(500, 500);
}
void draw() {
  triangle(houseX, 10, houseX-40, 50, houseX+40, 50);  // roof
  rect(houseX-40, 50, 80, 80);                 // walls
  rect(houseX+10, 90, 20, 40);                 // door
}
```

This draws the house shown in lecture! Following the procedure shown in lecture, introduce a variable named `houseX` that controls the horizontal position of the house and update the code to put the house in the middle of the canvas (`houseX = 250;` should do the trick).

6) [Optional] Take your finished code from question 5 and introduce a variable `houseY` that controls the vertical position of the house.

```
int houseX = 250;
int houseY = 200;
void setup() {
  size(500, 500);
}
void draw() {
  triangle(houseX, houseY-40, houseX-40, houseY, houseX+40,
houseY);  // roof
  rect(houseX-40, houseY, 80, 80);                 // walls
  rect(houseX+10, houseY+40, 20, 40);                 // door
}
```