Lecture 12: Loops Worksheet **Solutions**

1) When the following loops execute, how many times do they print "Duck"?

```
int i=0;
while (i<=3) {
  println("Duck");
  i=i+1;
}
println("Goose");
```

// How many ducks? __**4**__
// i = 0, 1, 2, 3

```
int i = 1;
while (i < 10) {
  println("Duck");
  i = i + 3;
}
println("Goose");
```

// How many ducks? __**3**__
// i = 1, 4, 7

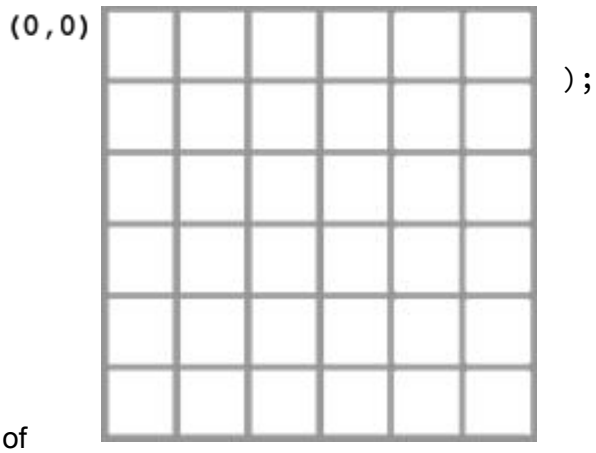
2) Fill in the table below detailing what happens on every iteration of the loop:

```
int v = 1;
while (v != -5) {
  rect(10*v, 10*v, 20, 20);
  v = -2*v+1;
}
```

Iteration	v	Condition	Executed
1	1	true	rect(10, 10, 20, 20);
2	-1	true	rect(-10, -10, 20, 20);
3	3	true	rect(30, 30, 20, 20);
4	-5	false	[exit loop]

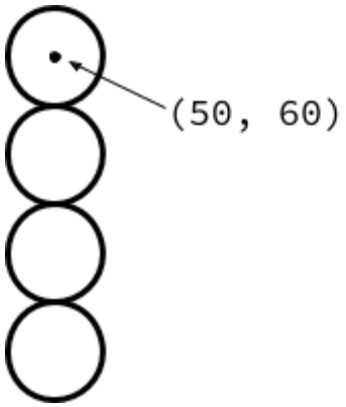
3) Given the for-loop below, draw the result on the grid using Processing's coordinate system:

```
noFill();
int i = 1;
while (i <= 3) {
   rect( 2*i-1, i, 4-i, 4-i
   i = i + 1;
}
```



4) Complete the loop below to draw the 4 circles of

radius 30 shown in the image:



Solution #1:

```
int c = 0;
while ( c < 4) {
  ellipse(50, 60 + 60*c, 60, 60);
  c = c + 1;
}
```

Solution #2:

```
int c = 1;
while (c < 5) {
  ellipse(50, 60*c, 60, 60);
  c = c + 1;
}
```

Solution #3:

```
int c = 60;
while (c <= 240) {
  ellipse(50, c, 60, 60);
  c = c + 60;
}
```

Solution #4:

```
int c = 5;
while (c > 0) {
  ellipse(50, 60*c, 60, 60);
  c = c - 1;
}
```

Other solution variants exist!