Lecture 10: Input and Output Worksheet Solutions

Functions Practice: Diamond

```java
void diamond(float x, float y, float w, float h) {
    beginShape();
    vertex(x, y - h/2);
    vertex(x + w/2, y);
    vertex(x, y + h/2);
    vertex(x - w/2, y);
    vertex(x, y - h/2);
    endShape();
}
```

Mouse Example: Drawing Dots

1) Write out the Processing code below to draw a red dot (diameter 20) centered on the current mouse position.
   ```java
   fill(255, 0, 0);
   ellipse(mouseX, mouseY, 20, 20);
   ```

2) Write out the Processing code below to draw a blue dot (diameter 20) centered on the current mouse position.
   ```java
   fill(0, 0, 255);
   ellipse(mouseX, mouseY, 20, 20);
   ```

Mouse Example: Rectangle Hover

1) Write out an expression (i.e., what would go inside an if) that will return true if the mouse is currently over the middle half of the canvas both vertically and horizontally.
   ```java
   // the following two lines are part of the same expression
   (mouseX >= width/4) && (mouseX <= 3*width/4) &&
   (mouseY >= height/4) && (mouseY <= 3*height/4)
   ```
Keyboard Example: Keyboard Dots

```java
int position = 0;

void setup() {
    size(400, 100);
    noStroke();
    background(0);
    fill(0);
}

void draw() {
    ellipse(position, 40, 40, 40);
}

void keyPressed() {
    if (key == 'g') {
        fill(0, 255, 0);
    }
    if (key == 'y') {
        fill(255, 255, 0);
    }
    if (key == 'm') {
        fill(255, 0, 255);
    }
    position = position + 50;
}
```

1) What is initially drawn before any key is pressed?

A _black_ circle of diameter 40 at position (0, 40) that you can't see against the black background.

2) What happens if we press 'g' once after we start the program?

A _green_ circle of diameter 40 is drawn at position (50,40) – position has been incremented by 50.

3) What happens if we press 'k'?

The fill does not change, but position still gets incremented by 50 so a new dot of the same color as the previous one gets drawn to the right.