Simple Data Visualization

Recall

```
TileGrid
for(int i = 0; i < numRect; ++i) {
    for(int j = 0; j < numRows; ++j) {
        fill(255);
        rect(initX + i*xDist, initY + j*yDist, xWidth, yHeight);
        fill(0);
        textSize(30);
        textAlign(CENTER, CENTER);
        text(i + "", initX + i*xDist, initY + j*yDist, xWidth, yHeight);
    }
}
```

Numbered

```
TileGrid numbered
for(int i = 0; i < numRect; ++i) {
    for(int j = 0; j < numRows; ++j) {
        fill(255);
        rect(initX + i*xDist, initY + j*yDist, xWidth, yHeight);
        fill(0);
        textSize(30);
        textAlign(CENTER, CENTER);
        text(j*numRect + i+1, initX + i*xDist, initY + j*yDist, xWidth, yHeight);
    }
}
```

Polygon

```
What is an Array?

- An array has 3 roles:
  - holds a group of values
  - a limited example of an object
  - Array variables are references, not values.

- Limited example of an object
  - must use new to instantiate it
  - has `length` as a field
  - When a variable represents an array it is always a reference.
```
Color

- A data type that represents an RGB color
  color oliveGreen = color(85, 107, 47);

- Functions that return a color component
  - red()
  - green()
  - blue()

```java
color c = color(20, 20, 140);
float r = red(c);
float g = green(c);
float b = blue(c);
fill(r, g, b);
fill(color(r, g, b));
fill(c);
```

Example: BallDrop Array

```java
void zeros(int[] changeMe)
    makes an array of ints and sets all of its values to 0;
```

```java
float[] zeros(int size)
    creates a float array of length size, sets all of the values to 0.0, and returns
    the array.
```

Variable Scope

- The part of the program from which a variable can be accessed.

Rules:
1. Variables declared in a block are only accessible within the block.
2. Variables declared in an outer block are accessible from an inner block.
3. Variables declared outside of any function are considered global (available to all functions).
4. Arrays and classes are passed by reference instead of copied.
### Snowfall in Bryn Mawr, PA

<table>
<thead>
<tr>
<th>Date</th>
<th>Snowfall in inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feb 8</td>
<td>0.2</td>
</tr>
<tr>
<td>Feb 9</td>
<td>0.3</td>
</tr>
<tr>
<td>Feb 10</td>
<td>0.4</td>
</tr>
<tr>
<td>Feb 11</td>
<td>0.0</td>
</tr>
<tr>
<td>Feb 12</td>
<td>0.2</td>
</tr>
<tr>
<td>Feb 13</td>
<td>0.0</td>
</tr>
<tr>
<td>Feb 14</td>
<td>0.0</td>
</tr>
<tr>
<td>Feb 15</td>
<td>1.0</td>
</tr>
</tbody>
</table>

### Pie Chart

Legend:
- 50.0%
- 25.0%
- 12.5%
- 6.25%
- 3.125%
- 1.5625%
- 1.5625%