Unit 3 Lesson 1 Animation

Knowledge Syntax:

1. **setup()** block runs once. It allows for any **initialization such as graphics window size, background color, stroke and frame rate.**
2. **size()** function sets the global variables **width** and **height.**
3. **background()** function sets the background color
4. **stroke()** function sets the stroke color
5. **draw()** block runs repeatedly. It is used to **handle animation.**
6. **width and height – detect and allows you to use window size**
7. **mouseX, mouseY – returns the x and y coordinates when mouse is clicked**
8. **frameRate(int)- sets the number of times per second the draw() is executed**

Using the variables width and height in your code

Circle in the center: *This program draws a circle with radius 50 in the center of the Graphics Window*

Center circle using own calculations
for a specific size window
size(400,400);
ellipse(200,200,50,50);
	Always in the middle regardless of window size
	
	ellipse(width/2, height/2, 50, 50);

I. Animation Task 1

Type the code below in a new processing window and run it. Do not include the line numbers!

```
1.  int y=200;
2.  int x=10;
3.  void setup()  {
4.     size(400,400);
5.     background(255);
6.   }
7.   void draw()  {
8.   y=y-1;
9.   x=x+1;
10.    myBackground();
11.   ballLeft();
12.   ballRight();
13. }
```

```
14.void myBackground() {
15.    stroke(0);
16.    fill(10,15,100);
17.    rect(0,0,400,400);
18.    fill(255);
19.    triangle(30,60,90,100,20,10);
20.  }
21. void ballLeft() {
22.     fill(10,30,255);
23.     ellipse(100+y,30,20,20);
24. }
25.   void ballRight() {
26.      fill(10,255,255);
27.     ellipse(10+x,60,30,30);
28.}
```

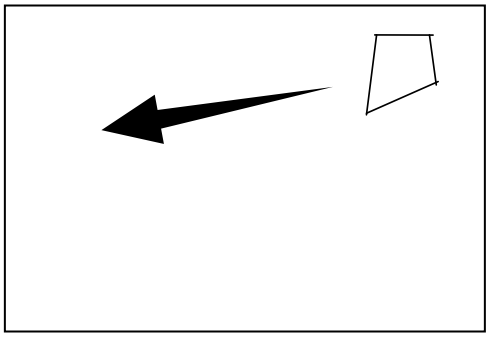
1. Move myBackground() below ballRight() and run the program. What happens to your animation?
   You can't see the animation any more

   Explain The frames are two fast for our eyes, but basically it is working, we just can't see it because the background is always printed after, and therefore over it.
2. Add delay(100) inside ballLeft(). What happens to the movement of both ellipses?
   They both move more slowly and unevenly.

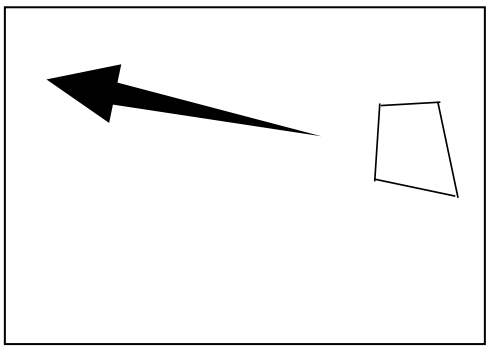
   Explain The delay() tells it to stop for a little bit every time draw repeats itself, so it will seem slower and is more uneven.
3. Delete from void draw() y=y-1 and x=x+1 . Type in x=x+1 as a first line in void ballRightI(). Do the same for y=y-1 by typing it in ballLeft(). What changes in the execution of the program Nothing.

   Explain: The statement is changing variables, and where we moved it it can also affect those variables without affecting anything else.
4. Using the same size (400,400) plot the location of the following shape and with an arrow show their projected movement on the canvas.

   a)
   ```
   beginShape();
   vertex(75+y,50);
   vertex(50+y,50);
   vertex(80+y,90);
   vertex(50+y,75);
   endShape();
   ```

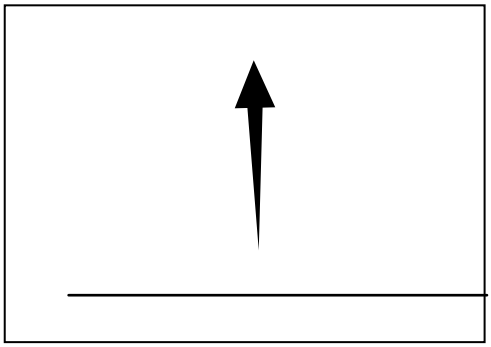


   b)
   ```
   beginShape();
   vertex(75+y,50+y/2);
   vertex(50+y,50+y/2);
   vertex(50+y,75+y/2);
   vertex(80+y,90+y/2);
   endShape(CLOSE);
   ```

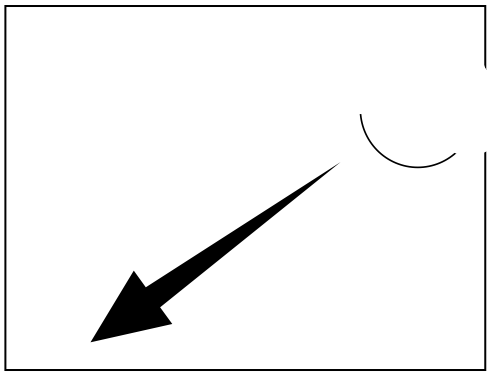


   c) line(70,160+x,350,160);

d) line(70,160-x,410,160-x);



e) arc(90+y,120+x,130,120,radians(50),radians(180));



Type each line of code in the program from page one placing it in either ballLeft() or ballRight() to verify the correctness of your drawing.

II. Animation Task 2

Modify your Greeting card to include animation.

a) Choose the objects which would naturally move.

b) Ensure you create separate procedures for your moving objects and name them accordingly.

c) Place any non-moving objects and background elements into a procedure named **myBackground().**

d) Include a void draw() procedure and call all of your procedures in it.

e) Preferably animate objects moving to/from different directions – i.e. in some manner "fly in".

f) If moving two objects together ensure they are in the same procedure.

Submit a folder named Yourname_AnimatedGreeting. Do not forget to include comments, variable comments and indent your code.