

Chapter 9

Classes and Arrays

Array Operations - recap

- Create an array

```
new int[50]
```

- Use a variable to refer to the newly created array

```
int[] ourFirstArray = new int[50];
```

- Place items into certain positions in the array (in this case *i* is a local variable in a for loop)

```
ourFirstArray[i] = someExpression;
```

- Get the value of an item stored at a certain position in the array (*i* is local variable in for loop)

```
println(ourFirstArray[i]);
```

//Which of these is not legal?

A.

```
int num = 5;  
float[] numbers = new float[num];
```

B.

```
int num = (5*6)/2;  
float[] numbers = new float[num];
```

C.

```
float num = 5.2;  
float[] numers = new float[num];
```

D.

```
int num = 5;  
Zoog[] zoogs = new Zoog[num * 10];
```

```
//ballClassMany
Ball[] balls = new Ball[10];
float gravity = 0.1;
float drag = 0.99;
void setup() {
    size(400, 400);
    fill(255,0,0);
    for(int i = 0; i < balls.length; i++)
        balls[i] = new Ball(random(width), random(height),
                             random(-1,1), random(-1,1),
                             (int)random(5,30));
}
void draw() {
    background(255);
    for (int i = 0; i < balls.length; i++) {
        balls[i].update();
    }
}
```

How many lines must be changed to have 1000 balls instead of 10?

A. 1

B. 2

C. 3

D. 4

E. more than 4

```
//ballClassMany
Ball[] balls = new Ball[10];
float gravity = 0.1;
float drag = 0.99;
void setup() {
    size(400, 400);
    fill(255,0,0);
    for(int i = 0; i < balls.length; i++)
        balls[i] = new Ball(random(width), random(height),
                             random(-1,1), random(-1,1),
                             (int)random(5,30));
}
void draw() {
    background(255);
    for (int i = 0; i < balls.length; i++) {
        balls[i].update();
    }
}
```

```
// Declare, initialize and draw Zoogs
Zoog zoog1, zoog2, zoog3;
void setup() {
    size(400, 400);
    zoog1 = new Zoog(100, 125, 60, 60, 16);
    zoog2 = new Zoog(200, 200, 60, 60, 16);
    zoog3 = new Zoog(300, 300, 60, 60, 16);
}
void draw() {
    background(190);
    float factor = constrain(mouseX/10, 0, 5);

    zoog1.jiggle(factor);
    zoog1.display();

    zoog2.jiggle(factor);
    zoog2.display();

    zoog3.jiggle(factor);
    zoog3.display();
}
```

```
// An Array of 100 Zoogs
Zoog[] zoogs;
void setup() {
    size(400, 400);
    zoogs = new Zoog[100];
    for(int i = 0;i < zoogs.length;i++)
        zoogs[i] = new Zoog((int)random(0,width),
                            (int)random(0,height),60,60,16);
}
void draw() {
    background(190);
    float factor = constrain(mouseX/10, 0, 5);
    for(int i = 0;i < zoogs.length;i++){
        zoogs[i].jiggle(random(0,factor)); //zoogs not synchronous
        zoogs[i].display();
    }
}
```

```
// A function to add element in the ith index of int array
```

```
int[] addElement(int[] arr, int index, int value){
```

```
    int[] temp = new int[arr.length + 1];
```

```
    //add items from i=0 to index
```

```
    for(int i = 0; i < index;i++){
```

```
        temp[i] = arr[i];
```

```
    }
```

```
    //add index to new array
```

```
    temp[index] = value;
```

```
    //shift items in new array over by 1
```

```
    for(int i = temp.length-1;i > index;i--){
```

```
        temp[i] = arr[i - 1];
```

```
    }
```

```
    return temp;
```

```
}
```



```
// array x starts out with value 3 missing at index 3
// add the value 3 at index 3

void setup(){
    int[] x = {0,1,2,4,5,6,7,8,9};
    x = addElement(x,3,3);
    println(x);
}
```