Outline

• Loops
• Program
Loops Overview

- Loops give us a way to execute the same code multiple times
  - Any time you find yourself copying and pasting code, you should either think “loop” or “method”
- There are four different ways you can loop in Java, all of which exist in C++
  - for loops
  - while loops
  - do..while loops
  - Recursion (direct or indirect)
for Loops

```java
for (int i=0; i < 10; i++) {
    System.out.print("i=" + i);
}

int numArr[10]; // assume populated
for (int i=0; i < num; i++) {
    for (int j=i+1; j < num; j++) {
        if (numArr[i] > numArr[j]) {
            int temp = numArr[i];
            numArr[i] = numArr[j];
            numArr[j] = temp;
        }
    }
}
```
while Loops

1 Scanner scan = new Scanner(System.in);
2 char ch = scan.nextChar();
3 while (ch != 'q') {
4    System.out.println(“Not right character”);
5    System.out.print (”Try again: “);
6    ch = scan.nextChar();
7 }
Loops

```java
1  Scanner scan = new Scanner(System.in);
2  System.out.print("Enter a number: ");
3  int val = scan.nextInt();
4  int remainder;
5  do {
6    remainder = val % 2;
7    System.out.print(remainder);
8    val /= 2;
9  } while (val != 0);
```
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Program

- Write a program that randomly generates dice rolls. The number of rolls will be provided by the user. Output the number of times each number occurred followed by the percentage. Here is a sample execution with user input bolded.

```
c:\> java csci201.Dice
How many rolls? 5000
The number 1 occurred 800 times (16%).
The number 2 occurred 750 times (15%).
The number 3 occurred 850 times (17%).
The number 4 occurred 825 times (16.5%).
The number 5 occurred 775 times (15.5%).
The number 6 occurred 800 times (16%).
c:\>
```