



Loops

CSCI 201

Principles of Software Development

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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



```
1  for (int i=0; i < 10; i++) {
2      System.out.print("i=" + i);
3  }
4  int numArr[10]; // assume populated
5  for (int i=0; i < num; i++) {
6      for (int j=i+1; j < num; j++) {
7          if (numArr[i] > numArr[j]) {
8              int temp = numArr[i];
9              numArr[i] = numArr[j];
10             numArr[j] = temp;
11         }
12     }
13 }
```

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 }
```

do..while Loops



```
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:\>
```