

CSE 20

Intro to Computing I

Lecture 7 – Loop Control Flow



Announcements

- ▶ Lab #9 this week
 - Due before your next lab
 - Make sure to show your work to **YOUR TA** (or me) before submission
- ▶ Reading assignment
 - Chapter 5.1-5.5 of textbook

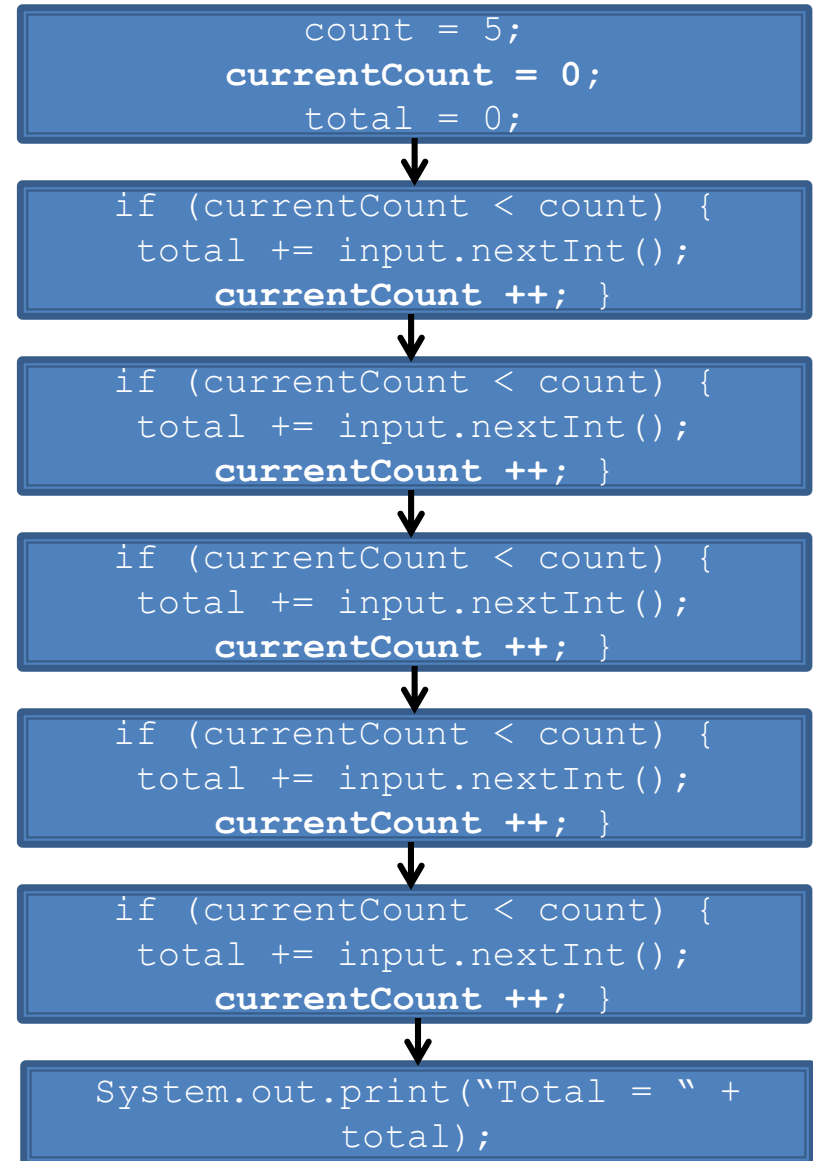
Check your UC Merced email for your invitation to take the New Student Survey!

- ▶ All new first-year and transfer students received an email invitation
 - Or visit: http://irds.ucmerced.edu/new_student_survey.html
- ▶ The survey...
 - Only takes about 10 minutes and ends November 20th
 - Asks about your educational plans, your transition to UCM, and the UCM services you use
- ▶ Your feedback will help us...
 - Improve the student experience for new undergraduates
 - Better understand what we can do to help you be academically successful

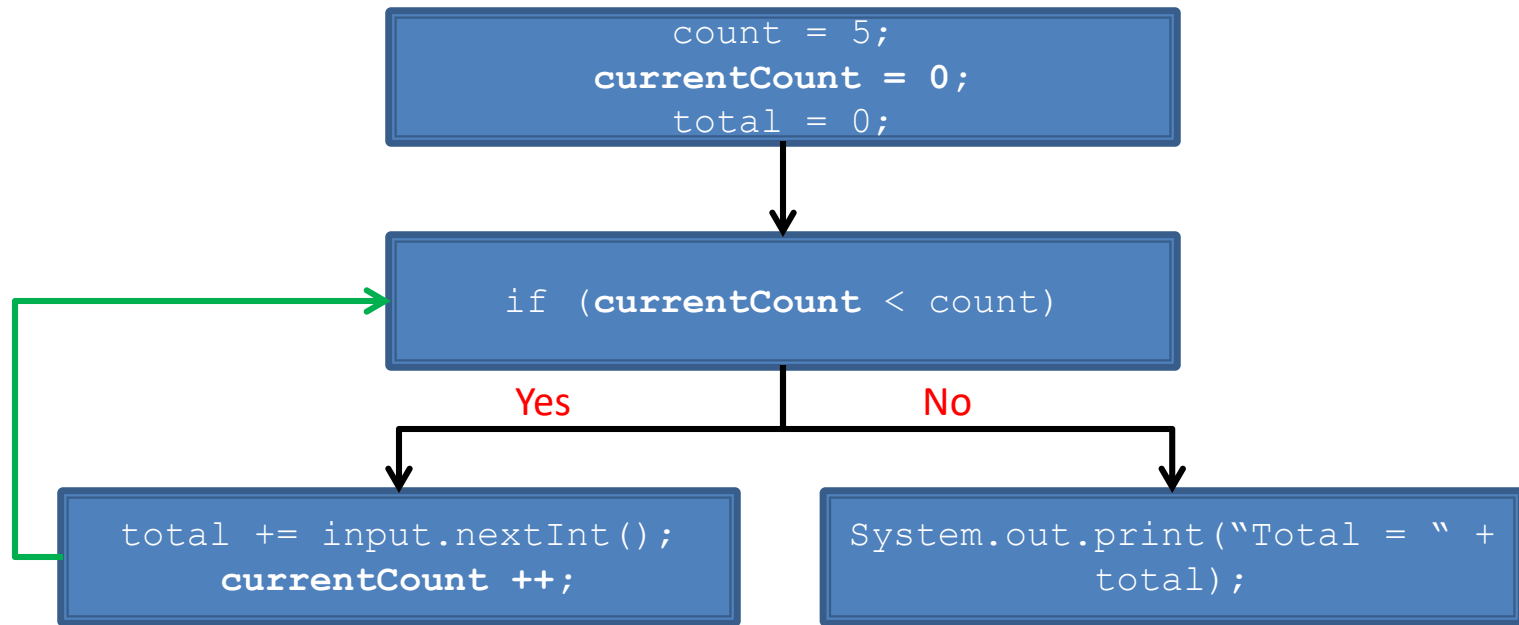
Sum of 5 Numbers

- ▶ To ask user to input 5 integers and calculate the sum
- ▶ We can keep track of the **currentCount** by using series of if-statements

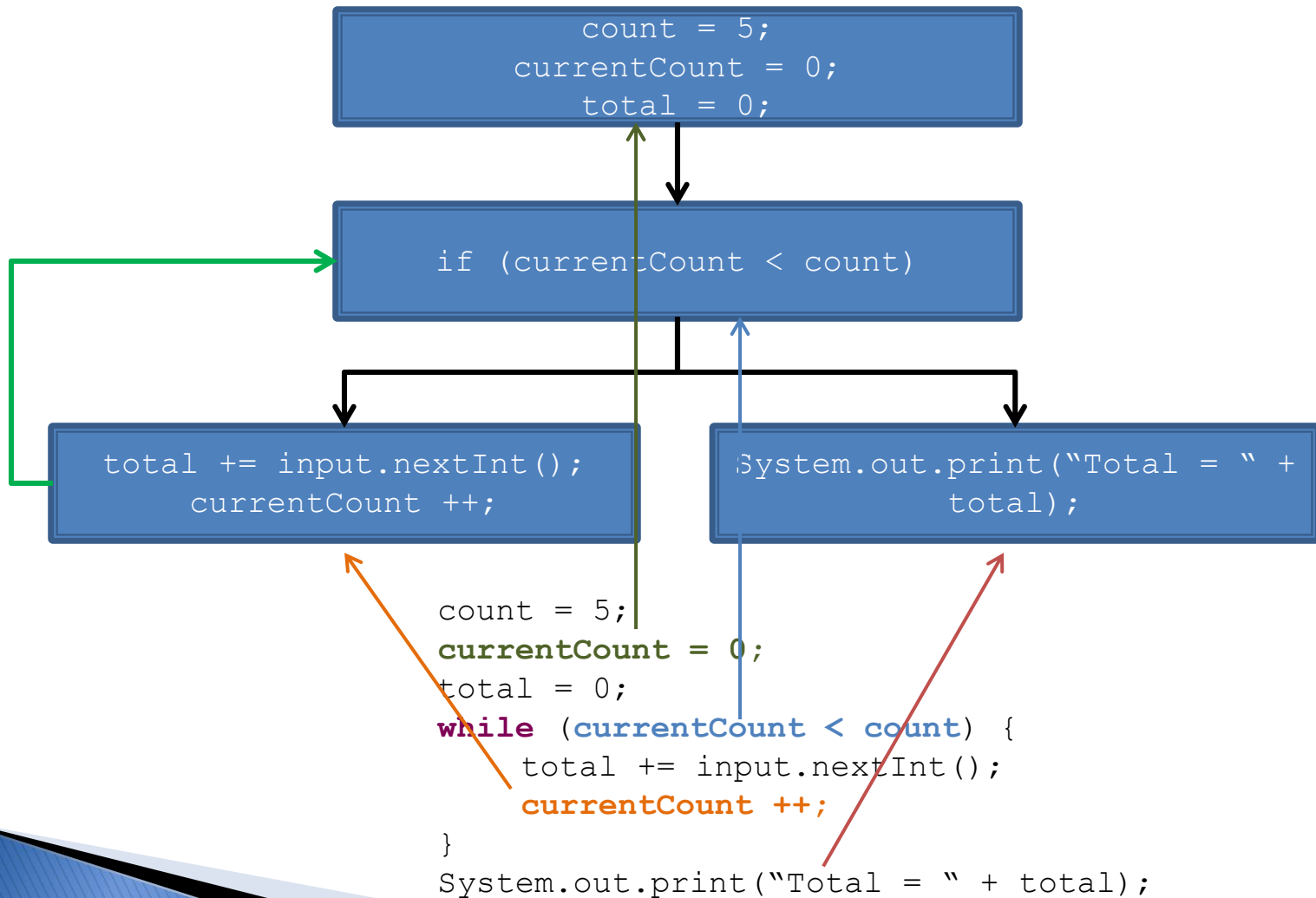
What if we have
1000 numbers???



Sum of 5 Numbers (Loop)



While-Loop



While-Loop

```
while ( running condition ) {  
    ...  
    body  
}
```

Example : AllNumWhile.java

```
System.out.print("Please enter the max number:");  
  
int max = input.nextInt();  
int i = 0;  
while (i <= max)  
{  
    System.out.println("Number " + i);  
    i++;  
}
```

Please enter the max number:5

Number 0

Number 1

Number 2

Number 3

Number 4

Number 5

How many times the loop runs?

Example : If-Else Nested

```
System.out.print("Please enter the max number:");
```

```
int max = input.nextInt();
```

```
int i = 0;
```

```
while (i <= max) {
```

```
    if (i == 2)
```

```
        System.out.println("Two");
```

```
    else
```

```
        System.out.println("Number " + i);
```

```
    i = i + 1; // i++
```

```
}
```

Please enter the max number:5

Number 0

Number 1

Two

Number 3

Number 4

Number 5

Example : Block Statement {}

```
System.out.print("Please enter the max number:");  
int max = input.nextInt();  
int i = 0;  
while (i <= max) {  
    if (i == 2)  
        System.out.print("Two: ");  
    System.out.println("Number " + i);  
    i++;  
}
```

Please enter the max number:5

Number 0

Number 1

Two: Number 2

Number 3

Number 4

Number 5

Continue : skip ahead

```
System.out.print("Please enter the max number:");  
int max = input.nextInt();  
int i = 0;  
while (i <= max) {  
    if (i == 2) {  
        i++;  
        continue;  
    }  
    System.out.println("Number " + i);  
    i++;  
}
```

Please enter the max number: 5

Number 0

Number 1

Number 3

Number 4

Number 5

Break: end early

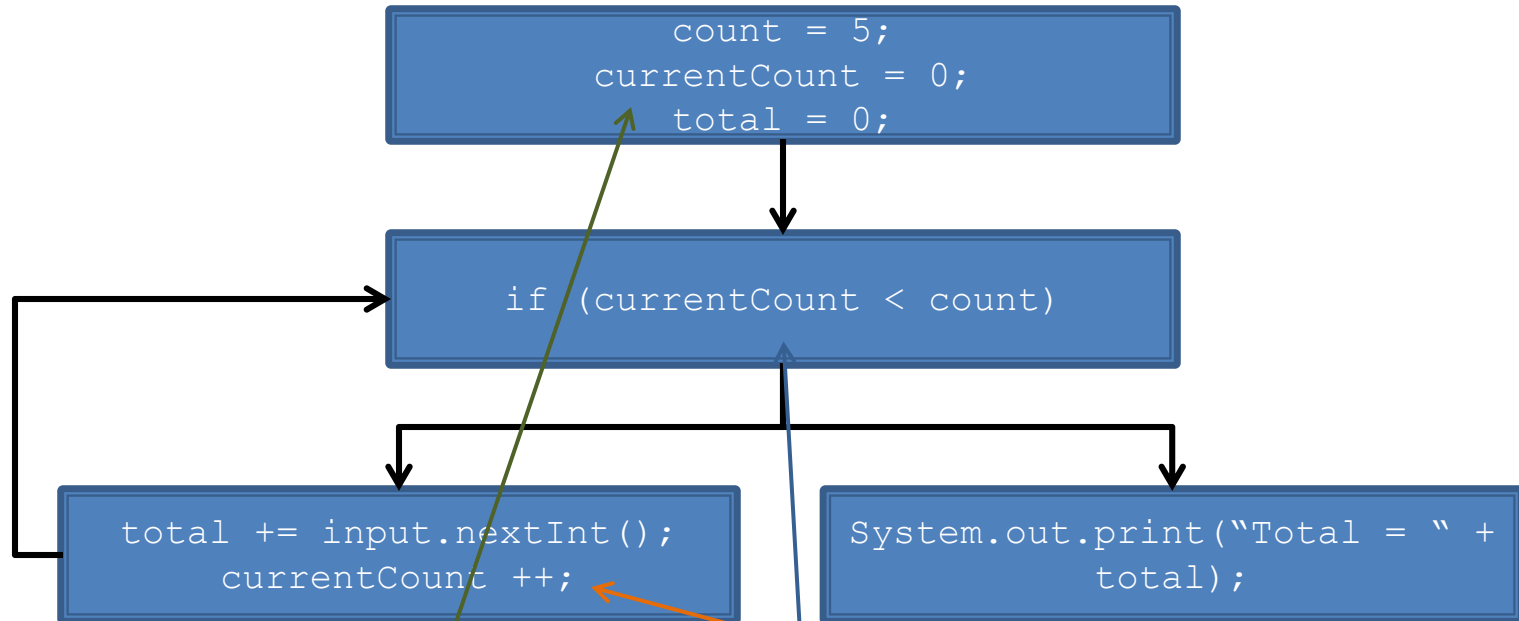
```
System.out.print("Please enter the max number:");  
int max = input.nextInt();  
int i = 0;  
while (i <= max) {  
    if (i == 2)  
        break;  
    System.out.println("Number " + i);  
    i++;  
}
```

Please enter the max number: 5

Number 0

Number 1

For-Loop



```
count = 5;  
total = 0;  
for (currentCount = 0; currentCount < count; currentCount ++)  
{  
    total += input.nextInt();  
}  
System.out.print("Total = " + total);
```

For-Loop

```
for ( initialization; continue condition; increment expression ) {  
    ...  
    body  
}
```

Example : AllNumFor.java

```
System.out.print("Please enter the max number:");
```

```
int max = input.nextInt();
```

```
int i;
```

```
for (i = 0; i <= max; i++)
```

```
{
```

```
    System.out.println("Number " + i);
```

```
}
```

Please enter the max number:5

Number 0

Number 1

Number 2

Number 3

Number 4

Number 5

Example : Block Statement {}

```
System.out.print("Please enter the max number:");
```

```
int max = input.nextInt();  
int i;  
for (i = 0; i <= max; i++) {  
    if (i == 2)  
        System.out.print("Two: ");  
    System.out.println("Number " + i);  
}
```

Please enter the max number:5

Number 0

Number 1

Two: Number 2

Number 3

Number 4

Number 5

Break: end early

```
System.out.print("Please enter the max number:");
```

```
int max = input.nextInt();  
int i;  
for (i = 0; i <= max; i++)  
    if (i == 2)  
        break;  
System.out.println("Number " + i);  
}
```

Please enter the max number: 5

Number 0

Number 1

For Loop : Iterations (max = 20)

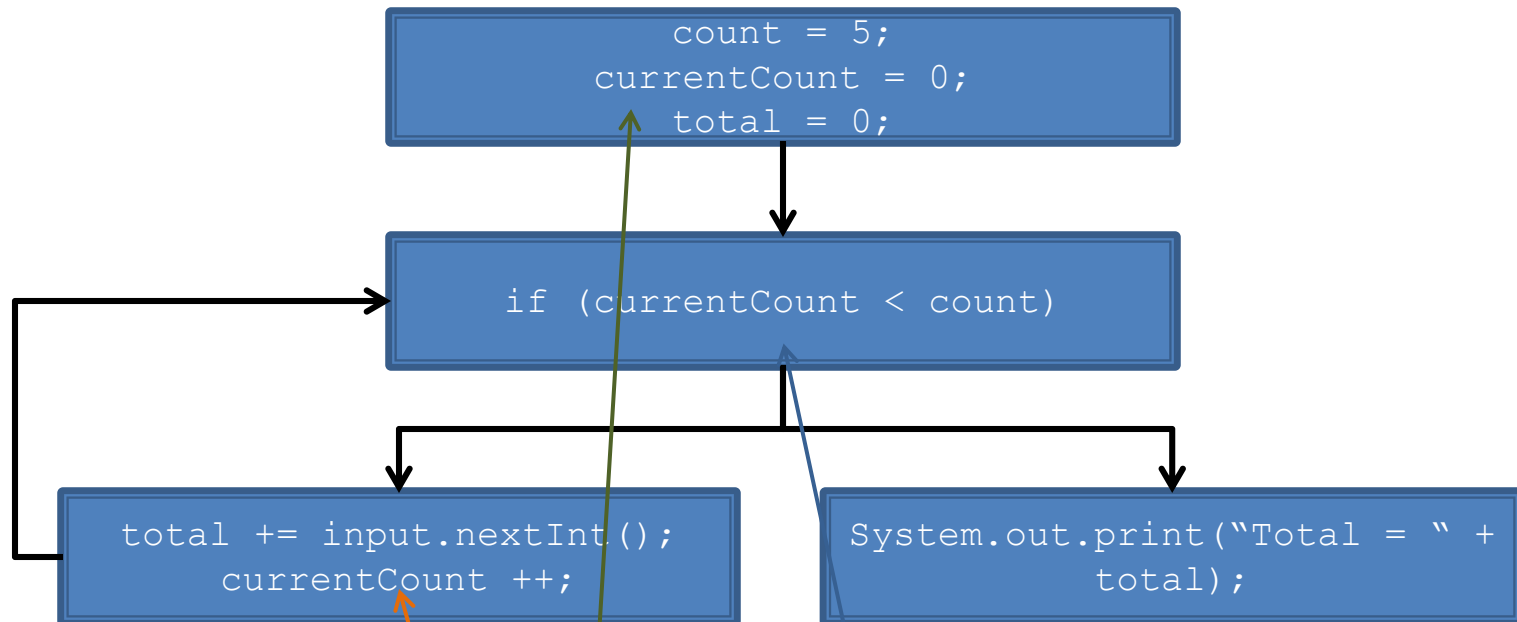
```
▶ for (int i = 0; i < max; i++)  
    if (i == max / 2)  
        break;
```

- Starts 0
- Goes up to 19
- $\text{max} / 2 = 20 / 2 = 10$
- when i is 10 it breaks out
- Number of iterations = 11

```
▶ for (int i = 0; i < max; i++)  
    if (i == max / 2)  
        continue;
```

- Starts 0
- Goes up to 19
- When i is 10 it continues so goes to i++ and i becomes 11 and loop keeps going
- Number of iterations = 20

Do-while Loop



```
count = 5;  
total = 0;  
currentCount = 0;  
do {  
    total += input.nextInt();  
    currentCount++;  
} while (currentCount < count);  
System.out.print("Total = " + total);
```

Example : AllNumDoWhile.java

```
System.out.print("Please enter the max number:");  
  
int max = input.nextInt();  
int i = 0;  
do  
{  
    System.out.println("Number " + i);  
    i++;  
}while (i <= max);
```

Please enter the max number:5

Number 0

Number 1

Number 2

Number 3

Number 4

Number 5

Example : AllNumDoWhile.java

```
System.out.print("Please enter the max number:");  
  
int max = input.nextInt();  
int i = 0;  
do  
{  
    System.out.println("Number " + i);  
    i++;  
}while (i <= max);
```

Please enter the max number:-1
Number 0

Body of loop will run at least one time!

Example : If-Else Nested

```
System.out.print("Please enter the max number:");
```

```
int max = input.nextInt();
```

```
int i = 0;
```

```
do {
```

```
    if (i == 2)
```

```
        System.out.println("Two");
```

```
    else
```

```
        System.out.println("Number " + i);
```

```
    i = i + 1; // i++
```

```
}while (i <= max);
```

Please enter the max number:5

Number 0

Number 1

Two

Number 3

Number 4

Number 5

Break: end early

```
System.out.print("Please enter the max number:");  
int max = input.nextInt();  
int i = 0;  
do {  
    if (i == 2)  
        break;  
    System.out.println("Number " + i);  
    i++;  
}while (i <= max);
```

Please enter the max number: 5

Number 0

Number 1