

EXTENDED IF STATEMENTS

SOMETIMES, THERE ARE MORE
THAN TWO OUTCOMES

HOW DO WE TEST FOR MULTIPLE THINGS?

```
char grade;  
double avg = 85;  
if( avg > 90 ){  
    grade = 'A';  
} else {  
    grade = 'F'; //This isn't right...  
}  
System.out.println( grade );
```

What if we want to
know exactly what
grade a student got?

IF / ELSE IF / ELSE IF / ELSE

```
char grade;
double avg = 95;
if( avg > 90 ){
    grade = 'A';
} else if ( avg > 80 ){
    grade = 'B';
} else if ( avg > 70 ){
    grade = 'C';
} else {
    grade = 'F';
}
```

```
System.out.println( "Your grade is " + grade );
```

You can have as many “else ifs” as you need.

The chain will always start with If and end with else.

Note the syntax `() {}` and `;`

HOW WOULD YOU ADD IN THE D GRADE?

```
char grade;
double avg = 95;
if( avg > 90 ){
    grade = 'A';
} else if ( avg > 80 ){
    grade = 'B';
} else if ( avg > 70 ){
    grade = 'C';
} else {
    grade = 'F';
}
System.out.println( "Your grade is " + grade );
```

HOW WOULD YOU ADD IN THE D GRADE?

```
char grade;
double avg = 95;
if( avg > 90 ){
    grade = 'A';
} else if ( avg > 80 ){
    grade = 'B';
} else if ( avg > 70 ){
    grade = 'C';
} else if ( avg > 65 ){
    grade = 'D';
} else {
    grade = 'F';
}
System.out.println( "Your grade is " + grade );
```

WRITE A METHOD THAT RETURNS "NEGATIVE" IF THE NUMBER IS NEGATIVE, "POSITIVE" IF IT IS POSITIVE AND "ZERO" IF IT IS 0

```
public String testSign ( int num ){
```

```
}
```

WRITE A METHOD THAT RETURNS "NEGATIVE" IF THE NUMBER IS NEGATIVE, "POSITIVE" IF IT IS POSITIVE AND "ZERO" IF IT IS 0

```
public String testSign ( int num ){  
  
    if( num < 0 ){  
        return "Negative";  
    } else if ( num > 0 ){  
        return "Positive";  
    } else {  
        return "Zero";  
    }  
  
}
```


WRITE A METHOD THAT RETURNS "NEGATIVE" IF THE NUMBER IS NEGATIVE, "POSITIVE" IF IT IS POSITIVE AND "ZERO" IF IT IS 0

```
public String testSign ( int num ){  
  
    if( num < 0 ){  
        return "Negative";  
    } else if ( num > 0 ){  
        return "Positive";  
    } else if ( num == 0 ){  
        return "Zero";  
    } else {  
        return "You have reached unreachable code!";  
    }  
  
}
```

WRITE A METHOD THAT RETURNS "NEGATIVE" IF THE NUMBER IS NEGATIVE, "POSITIVE" IF IT IS POSITIVE AND "ZERO" IF IT IS 0

```
public String testSign ( int num ){  
  
    if( num < 0 ){  
        return "Negative";  
    } else if ( num > 0 ){  
        return "Positive";  
    } else if ( num == 0 ){  
        return "Zero";  
    }  
}
```

WHEN DO YOU USE MULTIPLE IFS?

WHEN DO YOU USE IF/ELSE IF/ELSE

MULTIPLE IFs VS. IF/ELSE IF/ELSE

multiple single if statements: When each if statement is independent of the others

if/else if/else if /else: when you want to choose only **one** of the options. Usually you are testing the same variable for different conditions.

MAGIC 8 BALL

```
//Create a random number between 1-8  
int rNum = (int) (Math.random()*8) + 1;
```

```
if( rNum == 1 ){  
    System.out.println("Maybe");  
}
```

```
if( rNum == 2 ){  
    System.out.println("Yes");  
}
```

```
if( rNum == 3 ){  
    System.out.println("No");  
}
```

etc

REFLECTION

Suppose the random number chosen was 2? How many of the if statements would be executed? What if the number was 7?

Suppose you had a Magic 32 Ball where there were 32 possible answers. If you modified your program to provide 32 different responses, how many of the if statements would be executed when answering each question?