

Selection (`if` Statements)

Chaining and Nesting `if` Statements

Lecture Contents

- Review
 - The `boolean` type
 - Comparison Operators
 - The `if` statement
 - The `if...else` statement
- Chaining
- Nesting

The boolean Type

- The boolean type can take only two values, namely:
 - **true**
 - **false**
- Declaration of a boolean variable follows the same format as `int` and `double`:

```
boolean myBool = true;
```

Comparison Operators

Symbol	Name
==	equal to
!=	not equal to
>	greater than
>=	greater than or equal to
<	less than
<=	less than or equal to

**** Comparison operators return `boolean` ****

The `if` Statement

```
public static void main(String args[]) {  
    System.out.println("Starting Program...");  
    if(true) {  
        System.out.println("Hello World!");  
    }  
    System.out.println("Finished Program!");  
}
```

```
Starting Program...  
Hello World!  
Finished Program!
```

The `if` Statement

```
public static void main(String args[]) {  
    System.out.println("Starting Program...");  
    if(false) {  
        System.out.println("Hello World!");  
    }  
    System.out.println("Finished Program!");  
}
```

```
Starting Program...  
Finished Program!
```

The `if...else` Statement

```
public static void main(String args[]) {  
    System.out.println("Starting Program...");  
    if(true) {  
        System.out.println("Hello World!");  
    } else {  
        System.out.println("Goodbye cruel world...");  
    }  
    System.out.println("Finished Program!");  
}
```

Starting Program...
Hello World!
Finished Program!

The `if...else` Statement

```
public static void main(String args[]) {  
    System.out.println("Starting Program...");  
    if(false) {  
        System.out.println("Hello world!");  
    } else {  
        System.out.println("Goodbye cruel world...");  
    }  
    System.out.println("Finished Program!");  
}
```

```
Starting Program...  
Goodbye cruel world...  
Finished Program!
```

Chaining

- `if` gives a “one-way selection”
- `if...else` gives a “two-way selection”
- What if you want more...?

Chaining

```
public static void main(String args[]) {  
    printIsPositiveNegative(-7);  
    printIsPositiveNegative(0);  
    printIsPositiveNegative(200);  
}
```

```
public static void printIsPositiveNegative(int i) {  
    if(i > 0) {  
        System.out.println(i + " is positive.");  
    } else if (i < 0) {  
        System.out.println(i + " is negative.");  
    } else {  
        System.out.println(i + " is neither positive nor negative");  
    }  
}
```

Chaining

```
public static void main(String args[]) {  
    printIsPositiveNegative(-7);  
    printIsPositiveNegative(0);  
    printIsPositiveNegative(200);  
}
```

```
public static void printIsPositiveNegative(int i) {  
    if(i > 0) {  
        System.out.println(i + " is positive.");  
    } else if (i < 0) {  
        System.out.println(i + " is negative.");  
    } else {  
        System.out.println(i + " is neither positive nor negative");  
    }  
}
```

-7 is negative.
0 is neither positive nor negative
200 is positive.

Nesting

```
public static boolean canDrink(int age, boolean American)
{
    if(American) {
        if(age >= 21) {
            return true;
        } else {
            return false;
        }
    } else { // if not American, then Canadian
        if(age >= 19) {
            return true;
        } else {
            return false;
        }
    }
}
```

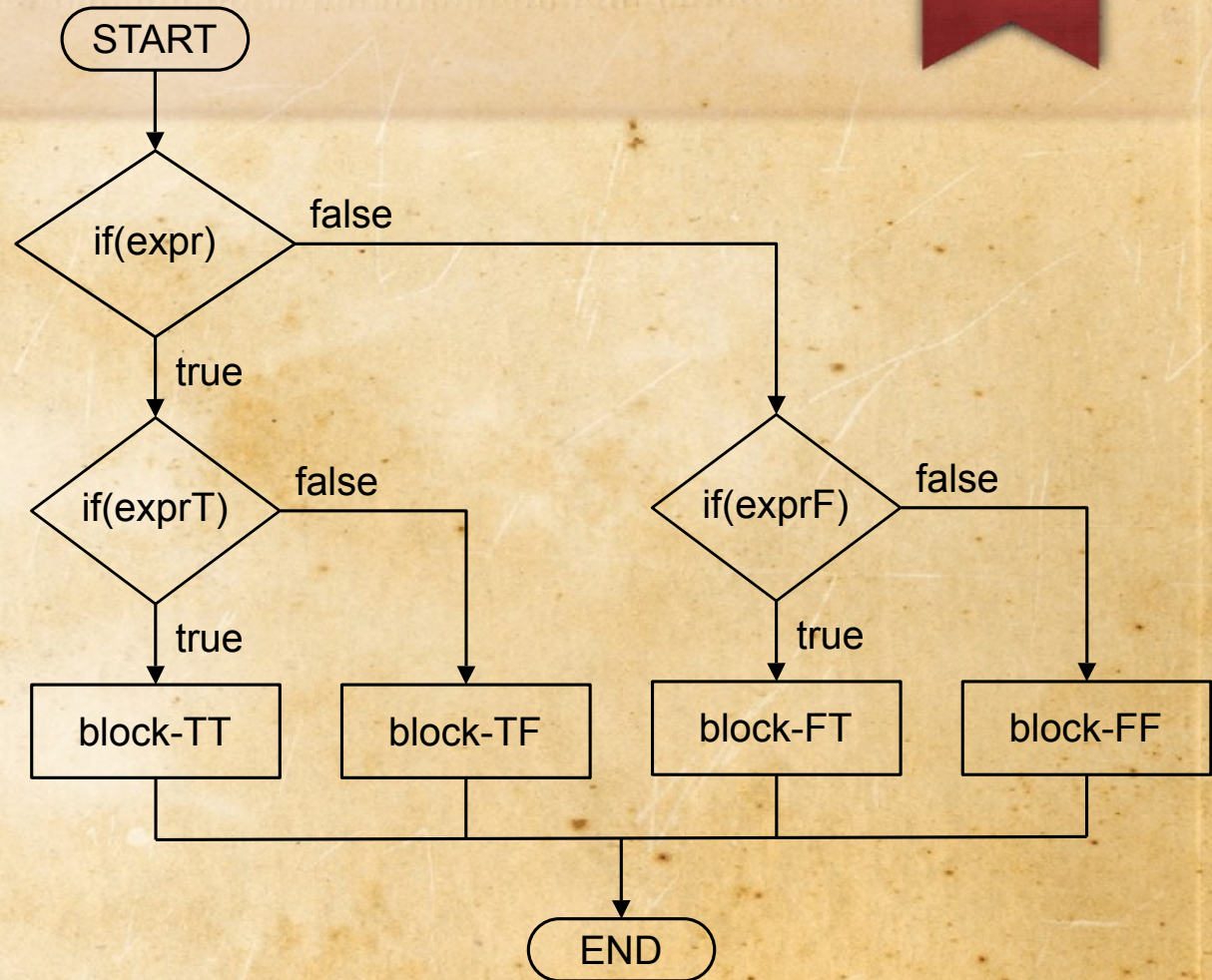
if statement
inside an if block

if statement inside
an else block

Summary

- Nesting

```
if (expr) {  
    if (exprT) {  
        ... block-TT ...  
    } else {  
        ... block-TF ...  
    }  
} else {  
    if (exprF) {  
        ... block-FT ...  
    } else {  
        ... block-FF ...  
    }  
}
```



Summary

- Chaining

```
if (boolOne) {  
    ...  
} else if (boolTwo) {  
    ...  
} else if (boolThree) {  
    ...  
} else {  
    ...  
}
```

- Nesting

```
if (boolOne) {  
    if (boolTwo) {  
        ...  
    } else {  
        ...  
    }  
} else {  
    if (boolTwo) {  
        ...  
    } else {  
        ...  
    }  
}
```

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