

# CN4001/ CD4001

## Software Development

### Topic 4: Making Choices

#### Part 3

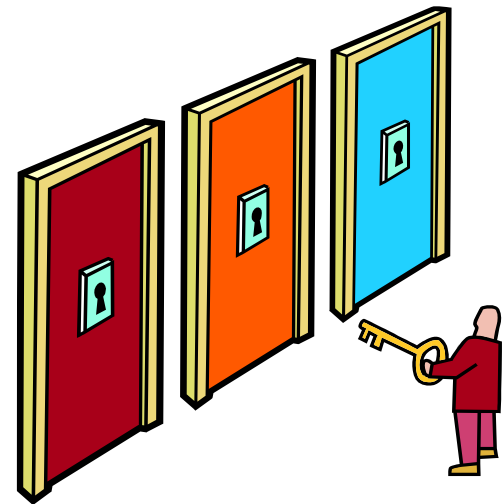


# Selection in Java

**if** statement

**if...else** statement

**switch** statement

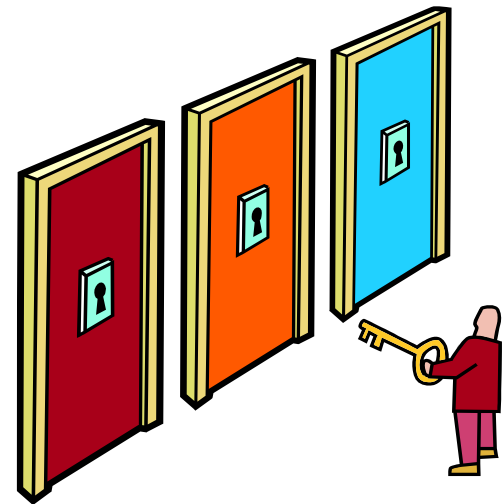


# Selection in Java

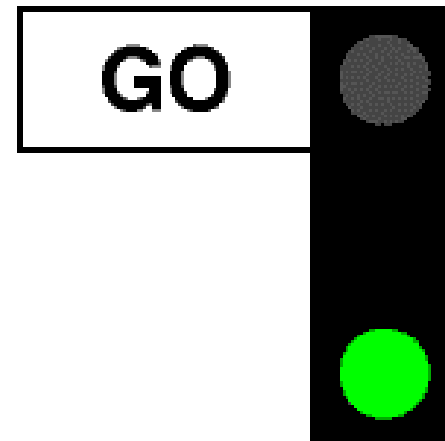
if statement

**if...else** statement

**switch** statement



# The 'if...else' statement




# The “**if...else**” statement

```
// some code here
if (/* a test goes here */)
{
    // some code here
}
else
{
    // some code here
}
// some code here
```

# The “**if...else**” statement


```
// some code here
if (/* a test goes here */)
{
    // some code here
}
else
{
    // some code here
}
// some code here
```

# The “**if...else**” statement



```
// some code here
if (/* a test goes here */) 
{
    // some code here
}
else
{
    // some code here
}
// some code here
```


# The “**if...else**” statement



```
// some code here
if (/* a test goes here */)
{
    // some code here
}
else
{
    // some code here
}
// some code here
```




# The “**if...else**” statement



```
// some code here
if (/* a test goes here */) ✓
{
    // some code here
}
else
{
    // some code here
}
// some code here
```

# The “**if...else**” statement


```
// some code here
if (/* a test goes here */ ) ✓
{
    // some code here
}
else
{
    // some code here
}
// some code here
```



# The “**if...else**” statement

```
// some code here
if (/* a test goes here */) ✓
{
    // some code here
}
else
{
    // some code here
}
➡ // some code here
```

# The “**if...else**” statement



```
// some code here
if (/* a test goes here */ )
{
    // some code here
}
else
{
    // some code here
}
// some code here
```


# The “**if...else**” statement

```
    // some code here
→  if (/* a test goes here */)
    {
        // some code here
    }
    else
    {
        // some code here
    }
    // some code here
```

# The “**if...else**” statement

```
// some code here
→ if (/* a test goes here */) ✗
{
    // some code here
}
else
{
    // some code here
}
// some code here
```

# The “**if...else**” statement

```
// some code here
if (/* a test goes here */ ) ×
{
    // some code here
}
else
{
     // some code here
}
// some code here
```

# The “**if...else**” statement

```
// some code here
if (/* a test goes here */ ) ×
{
    // some code here
}
else
{
    // some code here
}
→ // some code here
```



# The “**if...else**” statement

```
mark = sc.nextInt();
```

```
System.out.println("“You have passed!”);
```

```
System.out.println("“You have failed!”);
```

```
System.out.println("“Good luck with other exams”);
```



# Activity

“Use an **if else** statement to display a **pass message** when mark is 40 or above, otherwise a **fail message** should be displayed.


# The “**if...else**” statement

```
mark = sc.nextInt();  
if ( mark >= 40 )  
{  
    System.out.println("“You have passed!”);  
}  
else  
{  
    System.out.println("“You have failed!”);  
}  
System.out.println("“Good luck with other exams”);
```

## The “**if...else**” statement

```
mark = sc.nextInt();  
if ( mark >= 40 )  
{  
    System.out.println("“You have passed!”);  
}  
else  
{  
    System.out.println("“You have failed!”);  
}  
System.out.println("“Good luck with other exams”);
```

# The “**if...else**” statement



```
mark = sc.nextInt();  
if ( mark >= 40 )  
{  
    System.out.println("“You have passed!”);  
}  
else  
{  
    System.out.println("“You have failed!”);  
}  
System.out.println("“Good luck with other exams”);
```

# The “**if...else**” statement

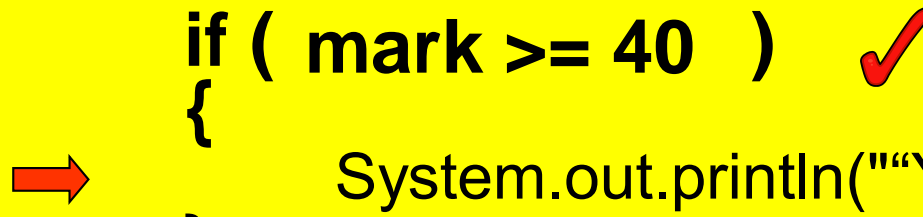
```
mark = sc.nextInt();  
→ if ( mark >= 40 )  
  {  
    System.out.println("“You have passed!”);  
  }  
else  
  {  
    System.out.println("“You have failed!”);  
  }  
System.out.println("“Good luck with other exams”);
```

# The “**if...else**” statement

```
mark = sc.nextInt();  
→ if ( mark >= 40 ) ✓  
{  
    System.out.println("“You have passed!”);  
}  
else  
{  
    System.out.println("“You have failed!”);  
}  
System.out.println("“Good luck with other exams”);
```

# The “**if...else**” statement

```
mark = sc.nextInt();  
if ( mark >= 40 ) ✓  
{  
    System.out.println("“You have passed!”);  
}  
else  
{  
    System.out.println("“You have failed!”);  
}  
System.out.println("“Good luck with other exams”);
```





# The “**if...else**” statement

```
mark = sc.nextInt();  
if ( mark >= 40 ) ✓  
{  
    System.out.println("“You have passed!”);  
}  
else  
{  
    System.out.println("“You have failed!”);  
}  
➡ System.out.println("“Good luck with other exams”);
```

# The “**if...else**” statement

```
➡ mark = sc.nextInt();  
  if ( mark >= 40 )  
  {  
      System.out.println("“You have passed!”);  
  }  
  else  
  {  
      System.out.println("“You have failed!”);  
  }  
  System.out.println("“Good luck with other exams”);
```

# The “**if...else**” statement


```
mark = sc.nextInt();  
→ if ( mark >= 40 )  
  {  
    System.out.println("“You have passed!”);  
  }  
else  
  {  
    System.out.println("“You have failed!”);  
  }  
System.out.println("“Good luck with other exams”);
```

# The “**if...else**” statement


```
mark = sc.nextInt();  
→ if ( mark >= 40 ) ×  
    {  
        System.out.println("“You have passed!”);  
    }  
else  
    {  
        System.out.println("“You have failed!”);  
    }  
    System.out.println("“Good luck with other exams”);
```

# The **"if...else"** statement


```
mark = sc.nextInt();  
if ( mark >= 40 ) ✗  
{  
    System.out.println("You have passed!");  
}  
else  
{  
    System.out.println("You have failed!");  
}  
System.out.println("Good luck with other exams");
```



# The “**if...else**” statement

```
mark = sc.nextInt();  
if ( mark >= 40 ) ×  
{  
    System.out.println("“You have passed!”);  
}  
else  
{  
    System.out.println("“You have failed!”);  
}  
 System.out.println("“Good luck with other exams”);
```

# The “**if...else**” statement

```
mark = sc.nextInt();  
if ( mark >= 40 ) ×  
{  
    System.out.println("“You have passed!”);  
}  
else  
{  
    System.out.println("“You have failed!”);  
}  
 System.out.println("“Good luck with other exams”);
```

```
import java.util.*;
public class DisplayResult
{
    public static void main(String[ ] args)
    {
        int mark;
        Scanner sc = new Scanner(System.in);
        System.out.println("What exam mark did you get? ");
        mark = sc.nextInt();
        if (mark >= 40)
        {
            System.out.println("Congratulations, you passed");
        }
        else
        {
            System.out.println("I'm sorry, but you failed");
        }
        System.out.println("Good luck with your other exams");
    }
}
```





# What exam mark did you get?

—



**What exam mark did you get?**

**52**

**Congratulations, you passed  
Good luck with your other exams**



# What exam mark did you get?

—

**What exam mark did you get?**

**35**

**Im sorry, but you failed**

**Good luck with your other exams**



# *Activity*

**“What is the output of the following program if the user enters **10** when prompted?”**

```
import java.util.*;
public class Selection
{
    public static void main (String[ ] args)
    {
        int x;
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter a number: ");
        x = sc.nextInt();
        if (x > 10)
        {
            System.out.println("Green");
        }
        else
        {
            System.out.println("Blue");
        }
        System.out.println("Red");
    }
}
```



# *Activity*

**“What is the output of the following program if the user enters **20** when prompted?”**

```
import java.util.*;
public class Selection
{
    public static void main (String[ ] args)
    {
        int x;
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter a number: ");
        x = sc.nextInt();
        if (x > 10)
        {
            System.out.println("Green");
        }
        else
        {
            System.out.println("Blue");
        }
        System.out.println("Red");
    }
}
```



# Combining tests



**5 Celsius**



**TEMPERATURE**



**12 Celsius**



```
if ( temperature >= 5 && temperature <= 12 )
```



Logical operator	Java counterpart
<b>AND</b>	<b>&amp;&amp;</b>
<b>OR</b>	<b>  </b>
<b>NOT</b>	<b>!</b>



```
if ( ! ( temperature >= 18 ) )
```





# *Activity*

**“What is the output of the following program if the user enters **10** when prompted?”**

```
import java.util.*;
public class Selection
{
    public static void main (String[ ] args)
    {
        int x;
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter a number: ");
        x = sc.nextInt();
        if (x > 5 && x < 10)
        {
            System.out.println("Green");
        }
        else
        {
            System.out.println("Blue");
        }
        System.out.println("Red");
    }
}
```



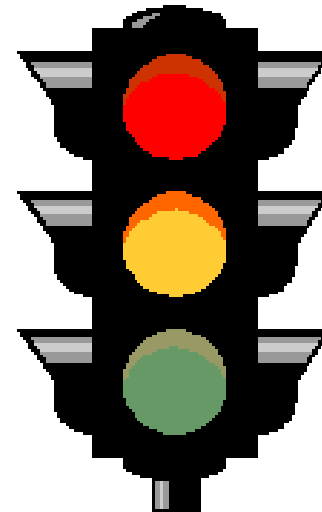
# *Activity*

**“What is the output of the following program if the user enters **8** when prompted?”**



```
import java.util.*;
public class Selection
{
    public static void main (String[ ] args)
    {
        int x;
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter a number: ");
        x = sc.nextInt();
        if (x > 5 && x < 10)
        {
            System.out.println("Green");
        }
        else
        {
            System.out.println("Blue");
        }
        System.out.println("Red");
    }
}
```

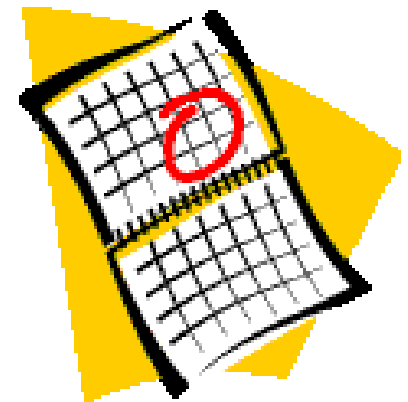
# Making Multiple Choices



# Nested 'if...else' statements



group	time
<b>A</b>	10.00 a.m.
<b>B</b>	1.00 p.m.
<b>C</b>	11.00 a.m

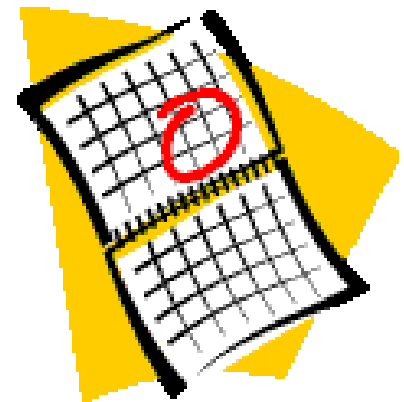


```
if (group == 'A')
{
    System.out.print("10.00 a.m");
}
else
{
    if (group == 'B')
    {
        System.out.print("1.00 p.m");
    }
    else
    {
        if (group == 'C')
        {
            System.out.print("11.00 a.m");
        }
        else
        {
            System.out.print("No such group");
        }
    }
}
```



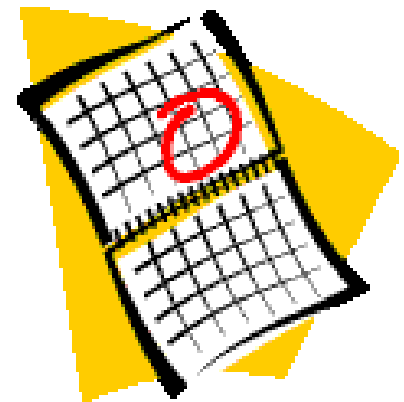
```
if (group == 'A')
{
    System.out.print("10.00 a.m");
}
else
{
```

```
    if (group == 'B')
    {
        System.out.print("1.00 p.m");
    }
    else
    {
        if (group == 'C')
        {
            System.out.print("11.00 a.m");
        }
        else
        {
            System.out.print("No such group");
        }
    }
}
```



```
if (group == 'A')
{
    System.out.print("10.00 a.m");
}
else
```

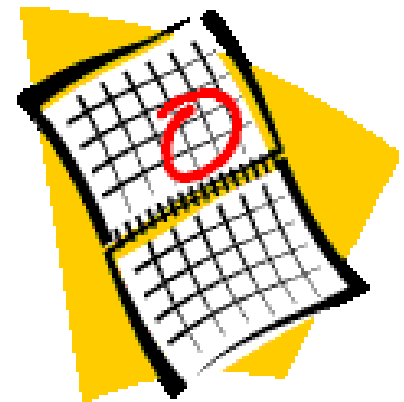
```
if (group == 'B')
{
    System.out.print("1.00 p.m");
}
else
{
    if (group == 'C')
    {
        System.out.print("11.00 a.m");
    }
    else
    {
        System.out.print("No such group");
    }
}
```



```
if (group == 'A')
{
    System.out.print("10.00 a.m");
}
else
```

```
if (group == 'B')
{
    System.out.print("1.00 p.m");
}
else
{
```

```
    if (group == 'C')
    {
        System.out.print("11.00 a.m");
    }
    else
    {
        System.out.print("No such group");
    }
}
```

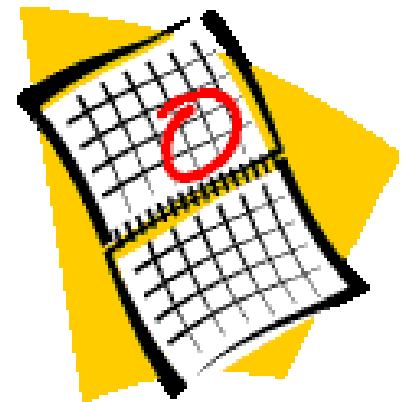




```
if (group == 'A')
{
    System.out.print("10.00 a.m");
}
else
```

```
if (group == 'B')
{
    System.out.print("1.00 p.m");
}
else
```

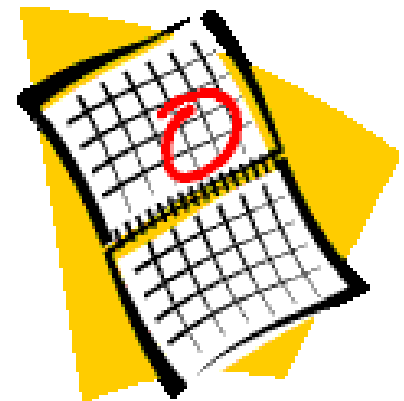
```
if (group == 'C')
{
    System.out.print("11.00 a.m");
}
else
{
    System.out.print("No such group");
}
```



```
if (group == 'A')
{
    System.out.print("10.00 a.m");
}
else
```

```
if (group == 'B')
{
    System.out.print("1.00 p.m");
}
else
```

```
if (group == 'C')
{
    System.out.print("11.00 a.m");
}
else
{
    System.out.print("No such group");
}
```



```
if (group == 'A')
{
    System.out.print("10.00 a.m");
}
else if (group == 'B')
{
    System.out.print("1.00 p.m");
}
else if (group == 'C')
{
    System.out.print("11.00 a.m");
}
else
{
    System.out.print("No such group");
}
```

