Java for Beginners

Level 3

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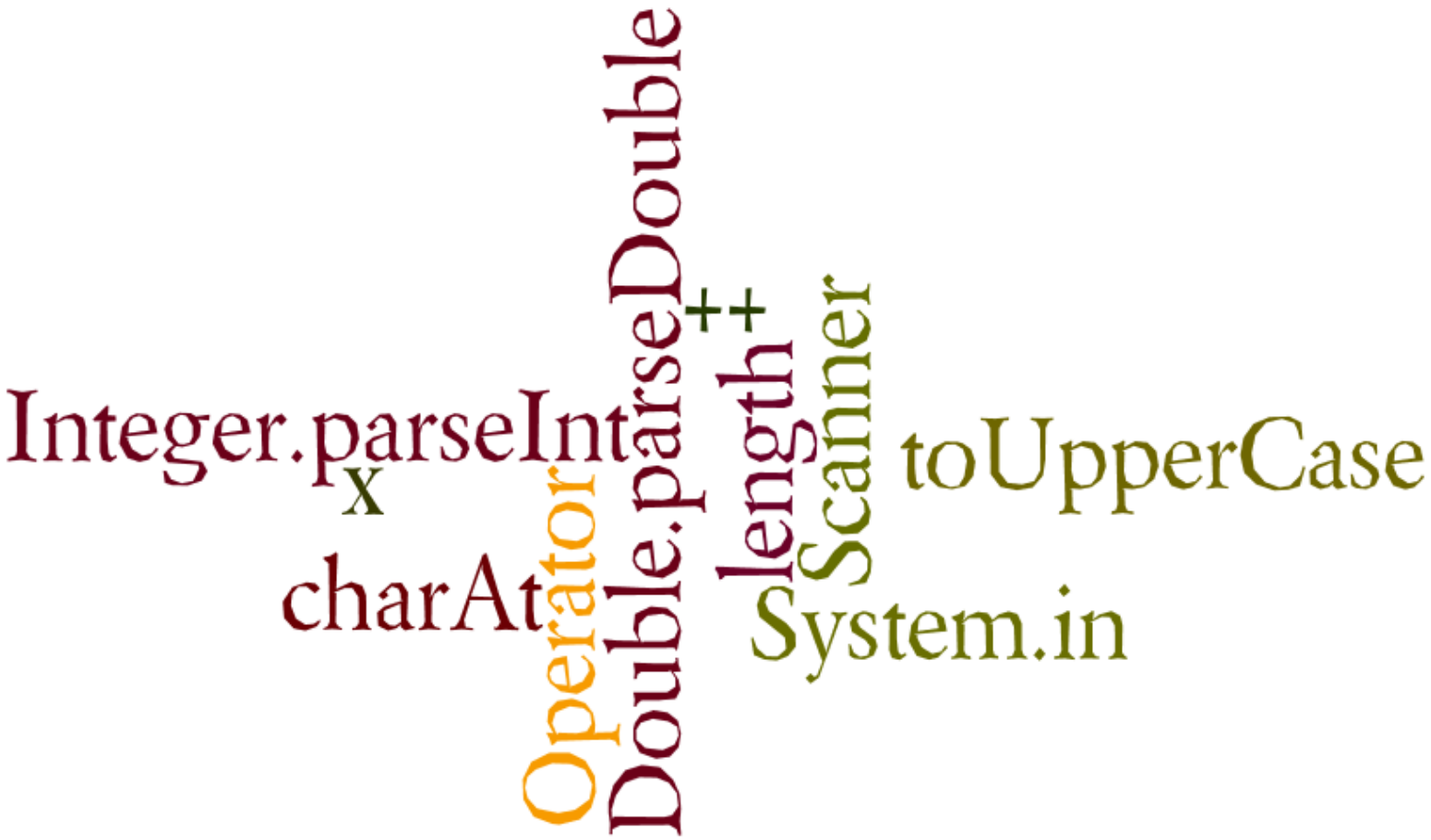
What do you learn last time?



Levels of Java coding

- 1: Syntax, laws, variables, output
- 2: Input, calculations, String manipulation
- **3: Selection (IF-ELSE)**
- 4: Iteration/Loops (FOR/WHILE)
- 5: Complex algorithms
- 6: Arrays
- 7: File management
- 8: Methods
- 9: Objects and classes
- 10: Graphical user interface elements

Four and ½ steps to keyboard input

- Import **`java.util.*`** BEFORE main()
- Declare a **`Scanner`**
- Declare a **`String`** variable to catch input
- Use the Scanner to assign input from keyboard to variable

- Convert to **`int/char/double`** (*if necessary*)

Keyboard input

```
import java.util.*;

public class HappyTime
{
    public static void main (String args[])
    {
        Scanner keyboard = new Scanner (System.in);
        System.out.println("When is your happy time?");
        String answer;
        answer = keyboard.nextLine();
        System.out.println("Your happy time is: "+answer);

    }//end of main
}//end of class
```

Calculations in Java

Operator	Function	Example	Result
+	Add	`int i = 10 + 2;`	12
-	Subtract	`int j = i – 3;`	9
/	Divide	`double k = j / 3;`	3.00
*	Multiply	`int product = i * j;`	108
++	Add 1	`i++;`	13
--	Subtract 1	`j--;`	8
%	Modulus	`int m = 12 % 5;`	2

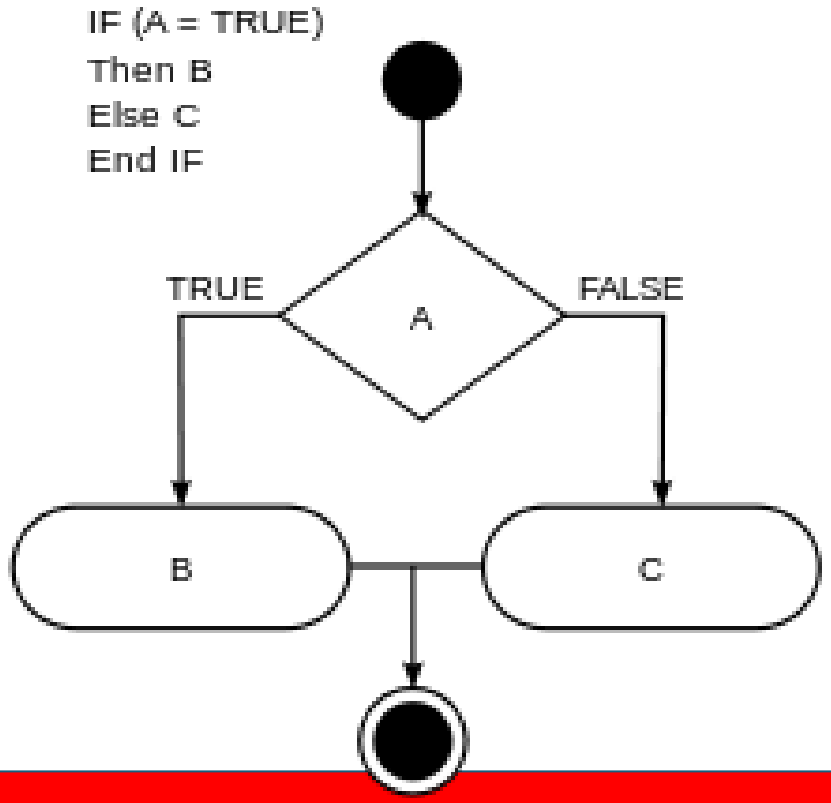
String methods

There are many functions we can use to **manipulate Strings**. They are called the '**String methods**'

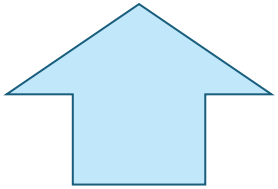
Method	Function	Example
`.charAt(x)`	returns the char from a specified index	`String colour = "blue";` `char letter = colour.charAt(0);`
`.toUpperCase()`	returns the String in UPPER CASE	`String name = "bob";` `bob = bob.toUpperCase();`
`.toLowerCase()`	returns the String in lower case	`String pet = "DOG";` `pet = pet.toLowerCase();`
`.subString(x,y)`	returns String portion between two indexes	`String s = "I love hats";` `String snip = s.substring(2,6);`
`.length()`	returns how many characters there are in a String	`String h = "radar";` `int size = h.length();`

IF (condition)

Used to change the flow of an algorithm, dependent on a condition.



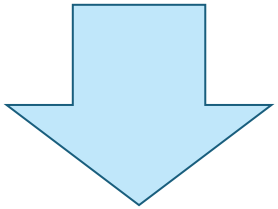
`if(condition)`



Condition is a logic check

something OPERATOR **something**

Example:



`if(num == 3)`

Logic operators in Java

Operator	Function	Example
`==`	equals (int, double, char, boolean)	`if(num==3)`
`.equals()`	equals (String)	`if(name.equals("Chris") )`
`>`	greater than	`if(num>20)`
`<`	less than	`if(num<15)`
`>=`	greater than or equal to	`if(age>=18)`
`<=`	less than or equal to	`if(age<=12)`
`!=`	not equal to	`if(married!=true)`

Warning! = does not mean ==

IF example (*int comparison*)

```
1  import java.util.*;
2  public class NumberCrunch
3  {
4      public static void main(String[] args)
5      {
6          Scanner kb = new Scanner (System.in);
7          System.out.print("Enter your age > ");
8          String answer = kb.nextLine();
9          int age = Integer.parseInt(answer);
10         if (age >= 18)
11         {
12             System.out.println("You are old enough!");
13         }
14     }
15 }
```

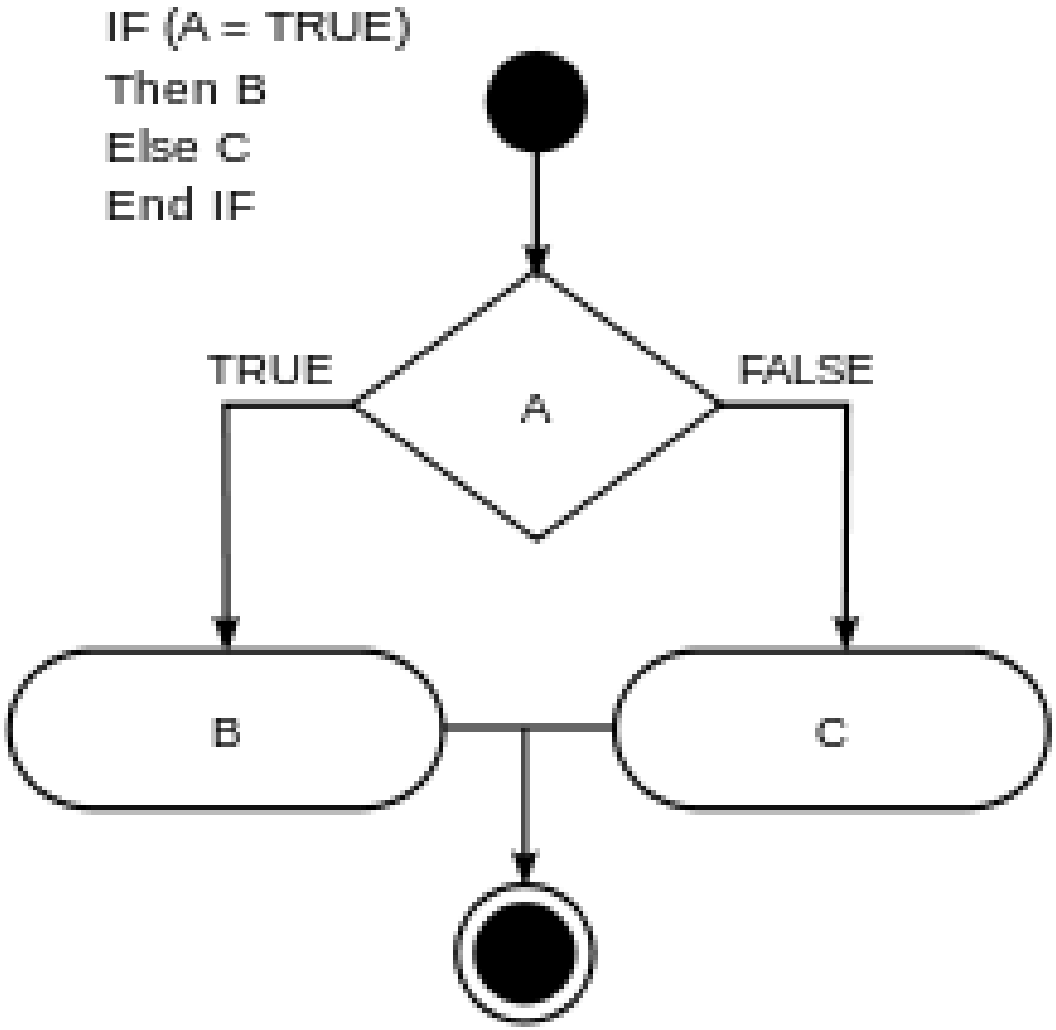
IF example (*String comparison*)

```
1  import java.util.*;
2  public class NumberCrunch
3  {
4      public static void main(String[] args)
5      {
6          Scanner kb = new Scanner (System.in);
7          System.out.print("Enter your name > ");
8          String answer = kb.nextLine();
9          if (answer.equals("Chris"))
10         {
11             System.out.println("Welcome home master");
12         }
13     }
14 }
```

What students struggle with

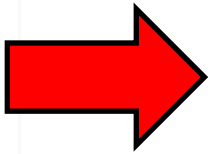
- `=` and `==`
- `.equals("xx")` for Strings
- Putting a `;` at the end of `if( xx)`
  - `if(num > 3);` ✗
  - `if(num > 3)` ✓

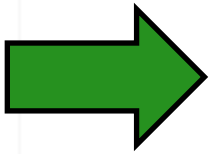
IF/ELSE (2 outcomes)



IF/ELSE (*int example*)

```
1  import java.util.*;
2  public class NumberCrunch
3  {
4      public static void main(String[] args)
5      {
6          Scanner kb = new Scanner (System.in);
7          System.out.print("Enter your shoesize > ");
8          String answer = kb.nextLine();
9          int size = Integer.parseInt(answer)
10         if (size > 12)
11         {
12             System.out.println("Too big - go online");
13         }
14         else
15         {
16             System.out.println("In stock");
17         }
18     }
19 }
```





Note conditions

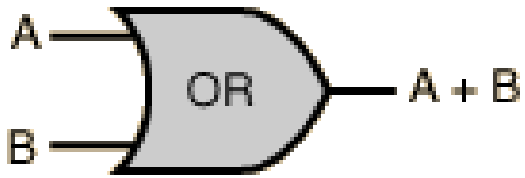
```
if (condition)
{
      something
}
else
{
      something else
}
```

Only IF gets a **condition**
ELSE does not

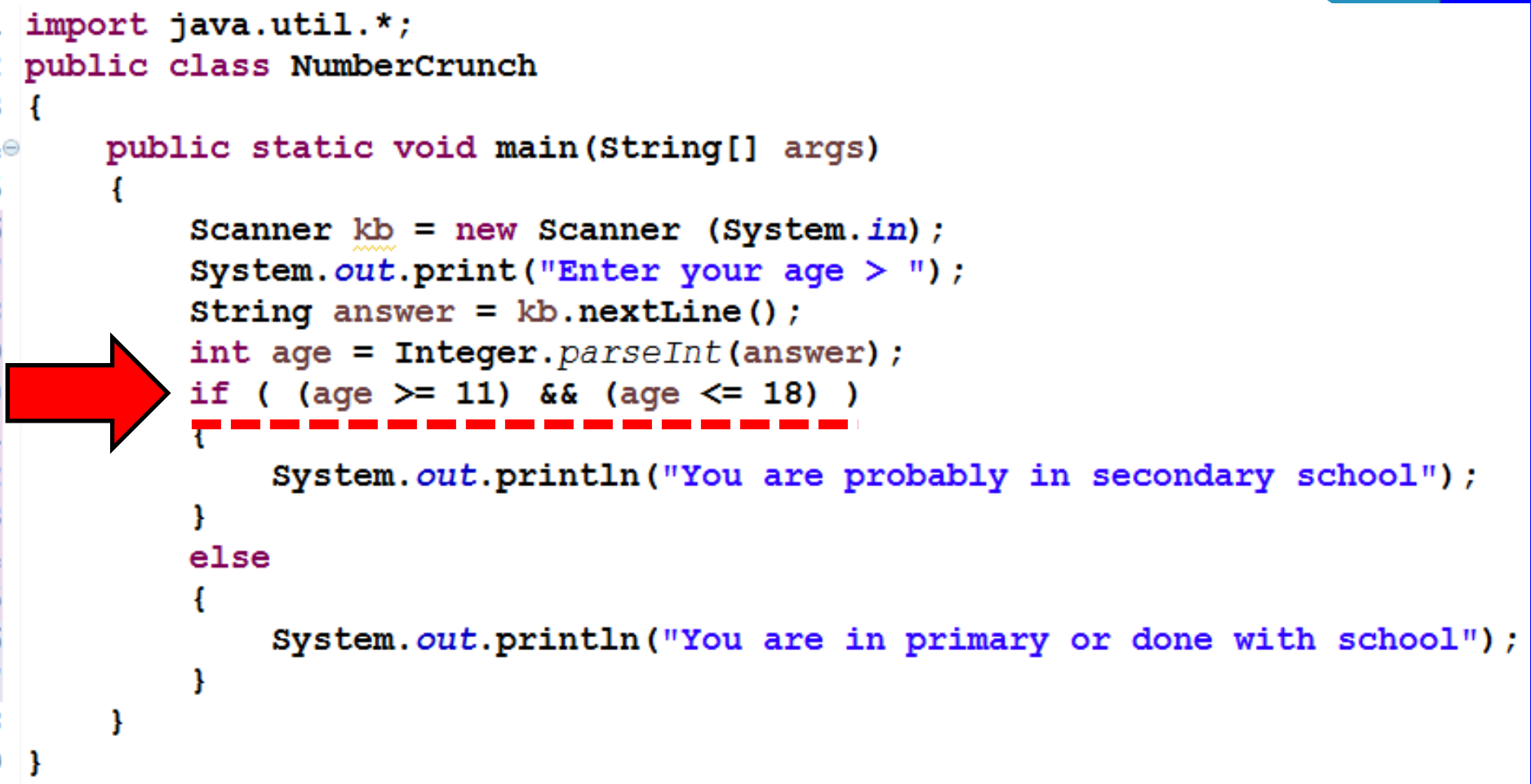
```
if (condition)
{
      something
}
else if (condition)
{
      something else
}
else
{
       third option
}
```

AND/OR

- AND in Java: **&&**
- OR in Java: **||**
- Used between conditions
  - **`if(num>3&&<12)`** ✗
  - **`if(num>3)&&(num<12)`** ✓



IF/ELSE (*int example with AND*)



```
1  import java.util.*;
2  public class NumberCrunch
3  {
4      public static void main(String[] args)
5      {
6          Scanner kb = new Scanner (System.in);
7          System.out.print("Enter your age > ");
8          String answer = kb.nextLine();
9          int age = Integer.parseInt(answer);
10         if ( (age >= 11) && (age <= 18) )
11         {
12             System.out.println("You are probably in secondary school");
13         }
14         else
15         {
16             System.out.println("You are in primary or done with school");
17         }
18     }
19 }
```

Switch/Case (*IF alternative*)

```
Scanner kb = new Scanner (System.in);
System.out.print("Enter your BMI > ");
String answer = kb.nextLine();
int BMI = Integer.parseInt(answer);
switch(BMI)
{
case 18: System.out.println("You are underweight");
    break;
case 23: System.out.println("You are normal");
    break;
case 27: System.out.println("You are slightly overweight");
    break;
case 30: System.out.println("You are very overweight");
    break;
case 35: System.out.println("You are obese!");
    break;
default: System.out.println("I don't know that BMI number");
}
```