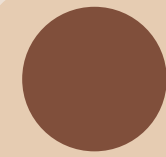


Topic 1.8: Special Operations

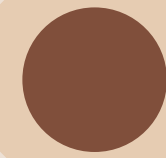
Learning Goals (Week 1):



Identify data types based on value



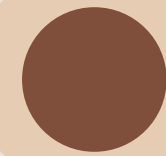
Map variables to the current values



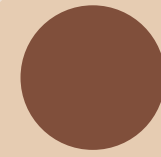
Perform basic operations on variables



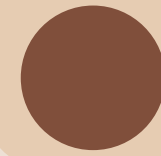
Create and use Java and user-defined methods



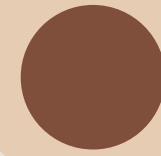
Format Printed Output



Obtain and process user input from the console



Use booleans, conditionals, and compound conditionals correctly



Select and implement different types of loops depending on scenario



Use special String and Math operations



Successfully implement and manipulate java arrays

Escape Characters

- Used to “escape” characters or sequences of characters in a String that have a special meaning in the context of a String literal
- `\` Allows a double quote character to show up in a String literal (rather than symbolizing the opening/closing of a String)
- `\n` New line
- `\\` Backward slash literal
- `\t` Tab (3-5 spaces depending on your System settings)
- There are others, these are the common ones

```
System.out.println(“Hello\nThisw will be on a new line.” +  
“\nSo will this and \tthis will be tabbed. \“This will be in quotes.\””);
```

Special String Methods (Some we already talked about)

- Check if two Strings identical: equals()

```
if("hello".equals("hello")) {} // true
```

```
if("hello".equals("Hello")) {} // false h != H
```

- Check for equality, NOT case-sensitive: equalsIgnoreCase()

```
if("hello".equalsIgnoreCase("hello")) {} // true
```

```
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```
if("hello".equalsIgnoreCase("Hello")) {} // true
```

- Length of a String (number of characters): length()

```
int a = "hello".length() \\ 5
```

```
int b = "".length()      \\ 0
```

- Char at position *i*: charAt(i)

```
System.out.println("hello".charAt(0)); \\ prints 'h'
```

```
System.out.println("hello".charAt("hello".length()-1)); \\ prints 'o'
```

```
System.out.println("hello".charAt("hello".length())); \\ prints ???
```

Special Math Methods

- `double Math.pow(double x, double y)`
 - takes `x` to the power `y`
- `double Math.sqrt(double x)`
 - gives the square root of `x`
- `int Math.min(int x, int y)`
- `int Math.max(int x, int y)`
 - give the minimum or maximum of the two
 - there are also versions for `long`, `float`, and `double`
- `double Math.random()`
 - gives a random double in the range $0 \leq x < 1$
 - note there is nothing inside `()` – but they still must be there!

“

There are many many more...

You can always visit the online documentation to learn more:

<https://docs.oracle.com/javase/8/docs/api/java/lang/Math.html>

”

Pause & Practice

Create a Java program that includes two methods: the **main()** method and a **squareUser()** method. The **main()** method is the starting point of your program. The **squareUser()** method should be declared as **public static int squareUser()**. Its role is to prompt the user to input a number. You will need to use the **Scanner** class and its **.nextLine()** method to read the user's input as a string. Once you have the input, convert this string to an **integer**. Then, calculate the square of this number using the **appropriate method from the Math class**. Finally, **squareUser()** should return the squared value.

In your **main()** method, call **squareUser()** and print the value it returns to the console. This program, when run, will allow the user to input a number and then display the square of that number.

Pause & Practice (Solution)

```
import java.util.Scanner;

public class SquareNumberProgram {
    public static void main(String[] args) {
        int squaredValue = squareUser();
        System.out.println("The square of the entered number is: " + squaredValue);
    }

    public static int squareUser() {
        Scanner scanner = new Scanner(System.in);
        System.out.println("Please enter a number:");
        String input = scanner.nextLine();

        // Convert the input String to an integer
        int number = Integer.parseInt(input);

        // Square the number
        return (int) Math.pow(number, 2);
    }
}
```