

CSCI 132:

Basic Data Structures and Algorithms

Lecture 3: Intro to Java (Data Types, Variables, Operators)

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Announcements

- Fill out the course questionnaire and join Discord
- We will discuss Lab 1 at end of class today

CSCI 132 TAs

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- They all have office hours in the **Computer Science Student Success Center (Barnard Hall 259)**

- There will also be junior/senior CS lab assistants present during lab

Hello World Program

```
package jan23;  
public class HelloWorld {  
    public static void main(String[] args) {  
        // This is a comment  
        System.out.println("Hello World");  
    }  
}
```

Java programs always start execution in public static void main(String[] args)

Code needs to go inside of the curly brackets {}
Whitespace does not matter ☺

Declaring Variables

Primitive Data Types

- `int`
- `double`
- `boolean`
- `char`
- `float`

Non-Primitive Data Types

- `String`

```
String s = "Reese";  
String last_name = "Pearsall";  
System.out.println(s + last_name)
```

Valid Variable Declaration

```
int i = 5;  
int x;  
int num = 125;  
  
char grade = "A";  
  
boolean flag = true;
```

When we declare a variable, we **must** define the datatype as well

Invalid Variable Declaration

```
i = 5;    (data type is not declared)  
int 2023year = 2023; (bad variable name)  
char final = "F"; (bad variable name)
```

Operators

- + (Addition)
- - (Subtraction)
- * (Multiplication)
- / (Division)
- % (Modulo)
- + (String concatenation)
- ++ (Increment)
- -- (Decrement)

```
int x, y, answer;  
x= 2;  
y = 3;  
answer = x + y;
```

Using the plus operator (+) between two values that are Strings will result in **String concatenation**

```
String x = "hi ";  
String y = "there";  
System.out.println(x + y);
```

```
>> hi there
```

Increment operator (++) will add 1 to a variable

```
int counter = 0;  
System.out.println(counter);  
counter++;  
System.out.println(counter);  
counter++;  
System.out.println(counter);
```

```
>> 0  
    1  
    2
```

User input

We use Java's **Scanner** library to get user input

```
import java.util.Scanner;
public class ScannerExample {
    public static void main(String Args[]) {
        Scanner scanner = new Scanner(System.in); //Creates Scanner object
        System.out.println("Enter your name:"); //prompt user for name
        String input = scanner.next(); // Accepts user input, stores result in input
        System.out.println("Your name is:" + input);
    }
}
```

Remember to import the Scanner library!

In class exercise

1. Write a program that will take in a temperature in **Fahrenheit**. The Program should convert the temperature to **Celsius**, and print it out to the screen

$$^{\circ}\text{C} = (^{\circ}\text{F} - 32) \times \frac{5}{9}$$

2. Write a program that will ask the user for an amount of pennies, nickels, dimes, and quarters. The program should compute the total change value, and print it to the screen

```
Enter number of pennies:
2
Enter number of Nickels:
1
Enter number of dimes:
2
Enter number of quarters:
2
Total change:0.77 cents
```