BEGINNER PROGRAMMING COURSE
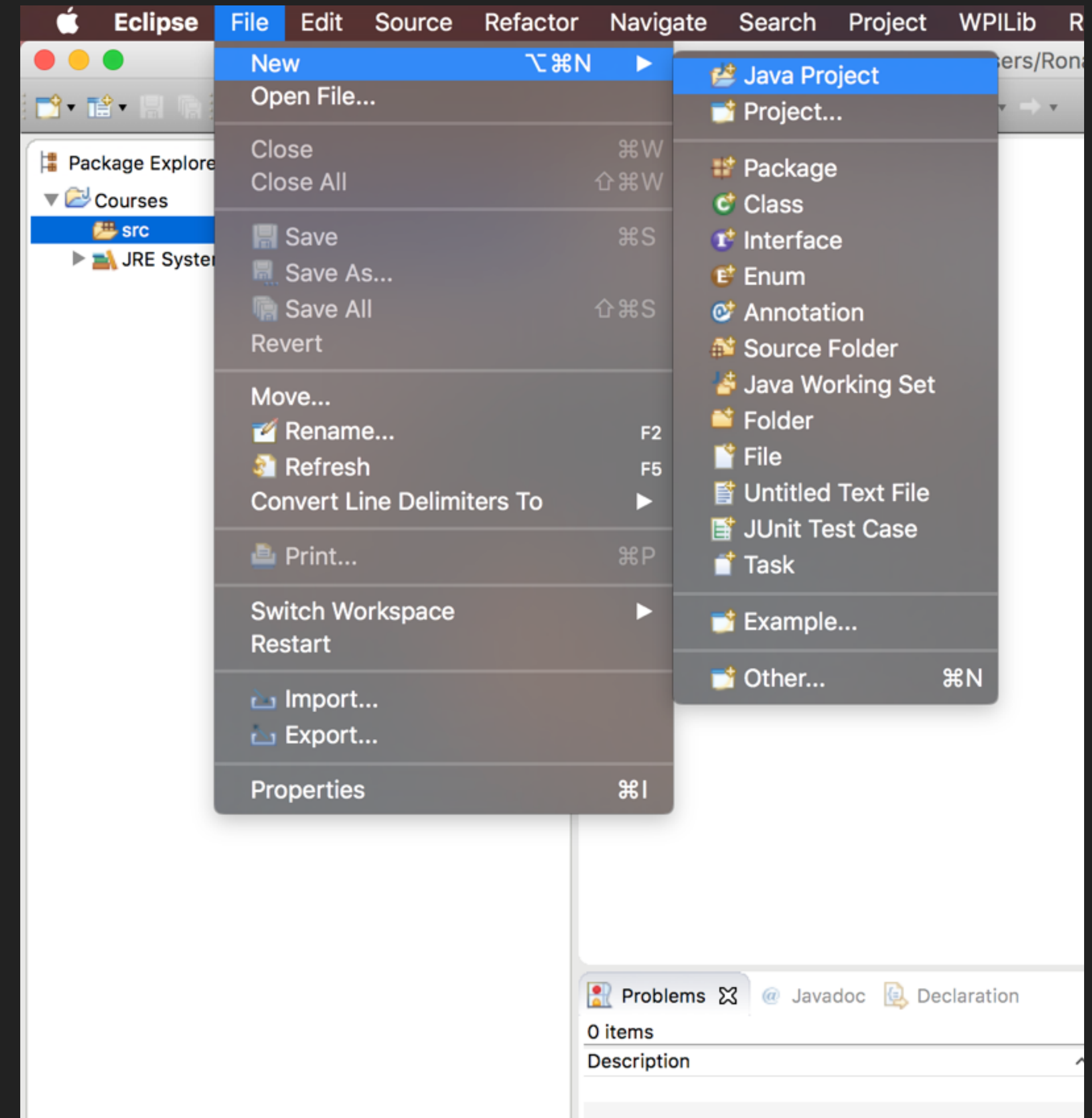
CLASS 1

INTRODUCTION TO JAVA

▸ Java is a "high level, object-oriented" programming language

▸ It is easy to learn, high-performance, and the language of choice for our robot, application developers, and the AP Computer Science curriculum

COURSE GOALS

▸ Over the next 15 meetings, we will learn a bulk of what is taught in AP Computer Science

▸ In order to do so, the classes will be comprised of lectures, activities, projects, homework, and "assessments of skill"

▸ It will be fast-paced, but if you do have a question, please ask me at any time

▸ Google and the internet are your friends - if you ever forget something, ask Google ;)

LETS START JAVA-ING

▸ Open up Eclipse

▸ Open up File > Switch Workspace > Other

▸ Click the "Browse" button, and then create a new folder for this class in the Documents folder

▸ Click the "Workspace" button in the top right corner

▸ Go to File > New > Java Project

▸ Name the project anything…

CREATE YOUR FIRST JAVA FILE

▸ Expand the project folder, right click 'src'

▸ Go to New > Class

▸ Name the 'Class' main, and check the box for

public static void main(String[] args)

▸ Yay.
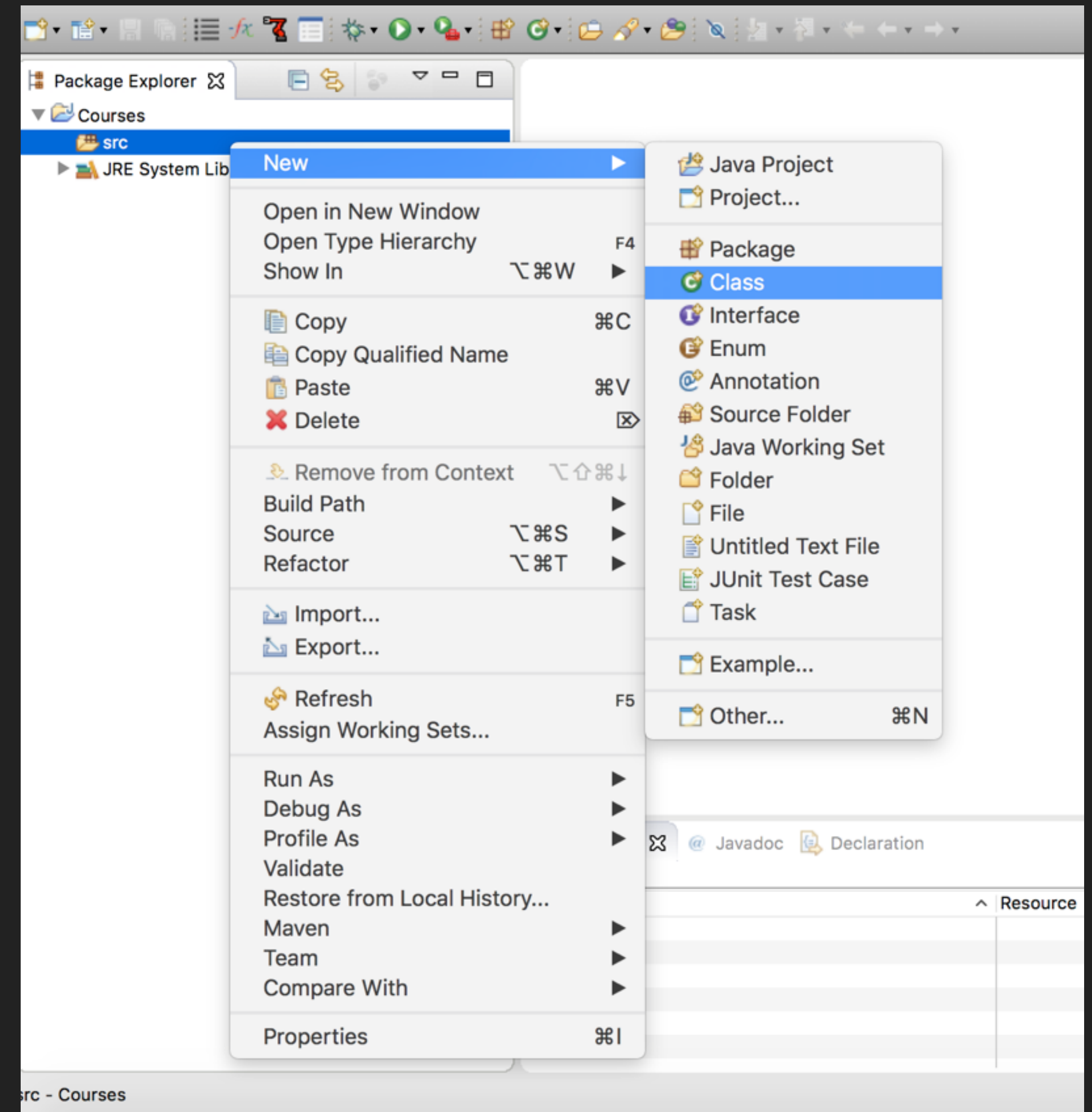
```java
// Package imports happen here

public class main {

    // Variables are defined here

    public static void main(String[] args) {
        // All of the code to be executed happens here
    }

    // More methods are created here
}
```

LET'S TALK ABOUT CODE FOR A SECOND

▸ Programming is composed of the following:

- A list of specific commands

- Modifying and manipulating various types of data

- Using sets of conditionals and iterative statements to provide instructive responses to a variety of inputs

DATA

▸ "The quantities, characters, or symbols on which operations are performed by a computer, being stored and transmitted in the form of electrical signals and recorded on magnetic, optical, or mechanical recording media."

▸ A computer program' sole purpose is to change to the values of data

DATA TYPES

▸ **byte, short, int, long:** integer values, each with a certain maximum and minimum length

▸ **float, double:** decimal values, each with a certain maximum and minimum length

▸ **boolean:** a true or false value

▸ **char:** a single character, out of 65,535

▸ **String:** a *nonprimitive* data type that is actually a set of chars. The value of this variable will be surrounded by quotes

VARIABLES

▸ Just like in math, data is stored in a **variable**

▸ A variable has a name, type, and value. One is defined by:

<div style="background: white; text-align: center;">

type name = value

</div>

▸ In order to **access the value of the variable,** put the name of the variable where you would put the raw data

▸ In order to **change the value of the variable,** type:

<div style="background: white; text-align: center;">

name = new value

</div>

TRY IT NOW

▸ In your **public static void main(String[] args)**, create variables that store the following values:

- -5

- FIRST Robotics

- 4.3

- d

- true

CHANGING DATA

▸ The most fundamental way to manipulate data is to use an **operator**

▸ An operator goes between two data sources to do something to one or both of them

data1 operator data2

THE SIX TYPES OF OPERATORS

▸ There are six types:

- Arithmetic

- Relative

- Bitwise

- Logical

- Assignment

- Miscellaneous

ARITHMETIC OPERATORS

▸ + (addition)

▸ - (subtraction)

▸ * (multiplication)

▸ / (division)

▸ % (remainder)

▸ ++ (plus 1)

▸ -- (minus 1)

ASSIGNMENT OPERATORS

▸ = (make equal to)

▸ += (x+=a is the same as x = x + a)

▸ -= (x-=a is the same as x = x - a)

▸ *= (x*=a is the same as x = x * a)

▸ /= (x/=a is the same as x = x / a)

RELATIONAL OPERATORS

▸ == (is equal to)

▸ != (is not equal to)

▸ > (is greater than)

▸ < (is less than)

▸ >= (is greater than or equal to)

▸ <= (is less than or equal to)

LOGICAL OPERATORS

▸ && (and)

▸ || (or)

▸ ! (not)

TEST YOUR SKILLS

▸ Using **System.out.println()** to output text to the console,

- Create two new variables with double values

- Output the sum, product, remained when the larger is divided by the smaller, and wether or not the two values are equal

▸ i.e. If **x** was the difference, you would say:

System.out.println("The difference is " + x)

HOMEWORK

▸ Review the data types and operators