Data Types

Area of a Rectangle

```java
1  /*
2      This program finds the area of a rectangle
3      @author Tom Gendreau
4  */
5  import java.io.*;
6  import java.util.*;
7
8  public class FindArea {
9      public static void main(String args[]) {
10         int length;
11         int width;
12         int area;
13         Scanner input = new Scanner(System.in);
14         System.out.print("Enter the length of the rectangle: ");
15         length = input.nextInt();
16         System.out.print("Enter the width of the rectangle: ");
17         width = input.nextInt();
18         area = length*width;
19         System.out.println("The area of the rectangle is "+area+".");
20
21     }
22 }
```

Input and Output I/O

- Input

  - Standard in

  - System.in

- Output

  - Standard out

  - System.out

  - System.out.println

  - System.out.print

  - System.out.printf

-

Primitive Data types

- Data types

  - Values

  - Operations

- int

  - Integers between -2147483648 and 2147483647 (-2^{31} to $2^{31}-1$)

- double

  - Floating point numbers +/- 4.94065645841246544e-324 to 1.79769313486231570e+308

- char

  - Single characters

  - Character codes

Primitive Data Types

- Constants

  - int

    - 10, 312

  - double

    - 473.458, 10.0

    - 4.73458E2

  - char

    - 'a', 'A', '*', '\n'

Primitive Data Types

- int and double operation (these are only some of the operations)

  - Unary minus   -

  - Multiplication   *

  - Division   /

  - Remainder   % (int only)

  - Addition   +

  - Subtraction   -

Primitive Data Types

- int and double

  - Precedence and associativity (order of operations)

    - - (unary minus) (right associative)

    - *, /, % (left associative)

    - +, - (left associative)

  - Parentheses

Classes and Objects

- Class

  - A container for code

  - A template that defines the data and operations for all objects of a particular type

- An object is an instance of class

- String

  - A finite sequence of characters

- Scanner

  - An simple text processor that can parse primitive data types and strings

  - Initially we will use it to get user input from standard in

Scanner

- Creating a Scanner

  - Scanner input = new Scanner(system.in)

- Scanner methods

  - nextInt

  - nextDouble

  - nextILine

  - next

String

- Constant

  - ""

  - "abc", "aBc", "x"

  - String constants are different then char constants

- Creating a string object

  - String s = new String("a1");

  - String x = "214";

- Operations

  - + (concatenation)

  - charAt

  - compareTo

  - length