Skeleton Java program

public class HelloWorld {  
 public static void main(String[] args) {  
 System.out.println("Hello world.");  
 }  
}

Printing to the screen

System.out.println(str); // str can be a String variable or literal

System.out.print(str); // no new line at the end

// Example:

System.out.println("Hello world.");

// Printing without a new line:

System.out.print("Hello world. ");

System.out.print("How are you?");

Variables

// Common types: int, long, (float), double, boolean, char, String

// Declare a variable:

int myVarName;

// Declare and initialize a variable:

int myVarName = 5;

// (Re-)Assign to an existing variable:

myVarName = 10;

// Print a variable:

System.out.println(myVarName);

System.out.println("The value is: " + myValue);

Comments

// Line comment

/\* Block comment

More lines

Yet more lines. \*/

User input

// goes at the top of the program

import java.util.Scanner;

// goes in main

Scanner scanner = new Scanner(System.in);

// Read a string

String str = scanner.nextLine();

// Read an integer

int num = scanner.nextInt();

// Read a double

double myDouble = scanner.nextDouble();

// Read a boolean

boolean bool = scanner.nextBoolean();

// To prompt the user for input, print the prompt

// then ask for input. For example:

System.out.println("What is your name? ");

String name = scanner.nextLine();

System.out.println("What is your age? ");

int age = scanner.nextInt();

### Comparison Operators

// Comparison operators evaluate to booleans (true/false values)

x == y // test if x is equal to y

x != y // test if x is not equal to y

x > y // test if x is greater than y

x >= y // test if x is greater than or equal to y

x < y // test if x is less than y

x <= y // test if x is less than or equal to y

// Comparison operators in if statements

if (x == y)

{

System.out.println("x and y are equal");

}

if (x > 5)

{

System.out.println("x is greater than 5.");

}

### Math

// Operators:

+ Addition

- Subtraction

\* Multiplication

/ Division

% Modulus (Remainder)

() Parentheses (For order of operations)

NOTE: Dividing one integer by another always results in an integer!

int x = 7 / 3; // x is now 2.

double y = 7 / 3; // Doesn’t help: y is 2.

double z = 7 / 3.0; // z is now 2.3333…

int w = 7 / 3.0; // Careful! Truncated to integer!

// Examples

int z = x + y;

int w = x \* y;

// Increment (add one)

x++;

// Decrement (subtract one)

x--;

// Shortcuts

x = x + y; x += y;

x = x - y; x -= y;

x = x \* y; x \*= y;

x = x / y; x /= y;

// More math:

Math.pow(a, b) returns a raised to the b power (as a double)

Math.random() returns a random floating-point number between 0 and 1 (as a double)   
  
Math.abs(x) returns the absolute value of x

### Casting: Convert from one variable type to another

Variable1 = (type)variable2;

// example:

double x = 2.9;

int y = (int)x; // y is now 2

### Booleans

// A boolean is either true or false

boolean myBoolean = true;

boolean anotherBoolean = false;

// Not operator

boolean x = !y; // x gets the opposite of y

// And operator

boolean z = x && y; // z is true if x and y are both true

// Or operator

boolean w = x || y; // w is true if either x or y are true

// You can combine many booleans!

boolean boolExp = x && (y || z);

### If Statements, If/Else, If/Else If/Else

**// Plain "if":**

if (***Boolean expression***)

{

// code to execute if true

}

// Example:

if (x < 0)

{

System.out.println("x is negative.");

}

**// "if" with "else":**

if (***Boolean expression***)

{

// code if true

}

else

{

// code if false

}

// Example:

if (x % 2 == 1 || x % 3 == 0)

{

System.out.println("x is odd or is divisible by 3");

}

else

{

System.out.println("x is even and not divisible by 3");

}

**// You can chain these together with "else if" (like Python's elif):**

if (condition\_1)

{

...

}

else if (condition\_2)

{

...

}

else if (condition\_3)

{

...

}

else

{

...

}

**// Nested ifs:**

if (condition\_1)

{

// this code runs if condition 1 is true

}

else

{

// this code runs if condition 1 is false

if (condition\_2)

{

// this code runs if condition 2 is true

}

else

{

// this code runs if condition 2 is false

}

}

### For Loops

for (initialization; test; increment)

{

/\* Code here \*/

}

**// How it works:**

// Run initialization. Then run the code in the loop while

// the test is true. Run the increment after each time through

// the loop.

// Print numbers 0-9:

for (int i = 0; i < 10; i++)

{

System.out.println(i);

}

// Print numbers 10 to 1:

for (int i = 10; i >= 1; i--)

{

System.out.println(i);

}

### While Loops

while (boolean expression)

{

/\* Repeat code betweeen brackets while the

boolean expression is true \*/

}

// Countdown from 15 to 11

int i = 15;

while (i > 10)

{

System.out.println(i);

i--;

}

### Do-While Loops

do

{

/\* Repeat code betweeen brackets while

'boolean expression' is true, but only begin

testing the expression after the loop has run once. \*/

} while (boolean expression);

// Example:

int x;

do

{

x = scan.nextInt();

} while (x != 0); // avoids having to initialize x to a dummy value

// Can use "while true" loops like in Python:

while (true)

{

// code

if (condition)

{

break;

}

}