

Hello World

```
// Nox_Lupus /
import java.util.Date;
public class Hello
{
    public static void
main(String[] args)
    {
        System.out.pri
ntln ("100 100 = 10,000 &
1000 100 = 100,000");
    }
} // dont forget me
```

program development

program development = WHAT

software design = HOW & create the pseudocode with classes and objects needed

software implementation = requires the least amount of creativity

goal of **testing** is to find logical and run-time errors

class/method

public static void main(String[] args)

A **class constructor** usually defines how an object is initialized

A Java **variable** is the name of a data value stored in memory that *can change its value* but *cannot change its type* during the program's execution

it all so can **contain** a value or a reference

local variable's scope is restricted to the method where it was declared

Abstract methods are used when defining abstract classes & Interfaces

All classes in Java are directly or indirectly subclasses of the **Object class**

Autoboxing is the automatic creation of a wrapper object from its corresponding primitive type, *it also provides a static constant*

class/method (cont)

method overloading = having multiple class methods of the same name where each method has a different number of or type of parameters

If two variables contain **aliases** of the same object then the object may be modified using either alias & the object will become an "-orphan" if both variables are set to null

Inheritance through an extended (derived) class supports **code reuse**

Instance data for a Java class may be primitive types or objects

Static methods cannot reference instance data

The advantages of the **DecimalFormat** class compared with the **NumberFormat** class include precise control over the number of digits to be displayed

The **behavior** of an object is defined by the object's methods

The **relationship** between a *class* and an *object* is best described as a objects are instances of classes

encapsulation, inheritance, polymorphism are the main programming mechanisms that **constitute object-oriented** programming

all classes can have any number of children but only one parent

compareTo is not a method of the Object class

JavaFX

A color image is broken down into individual pixels in RGB

In a development environment that fully supports JavaFX, Since the launch method is called automatically, you do not need to write the **main method**, and the **launch method** is called automatically

upper-left corner of a stage is (0,0)

You should override the **start** method in a JavaFX Application

JavaFX (cont)

Parent, Group, StackPane can be used as a **root** node in a JavaFX, ImageView cannot

the **javafx.scene.shape** package includes classes that represent shapes in JavaFX

Window is not a kind of object that is used to create a graphical user interface in JavaFX

array

in Java, arrays are objects

```
int[] arr = new int[n];
arr.length = n
Index = 0 - n-1
```

If a and b are both int arrays, then a = b; will create an alias

an int array is passed as a **parameter** to a method you would say: (int[] a)

if the statement arr[-1] = 0, it will throw the **ArrayIndexOutOfBoundsException** Exceptions

The "off-by-one" error associated with arrays arises because the first array index is 0 or the loop went to far

str.charAt(2); could throw a StringIndexOutOfBoundsException because the array could be smaller than 3

Their lengths never change & The shortest string has zero length these are properties are true of **String** objects

sorting algorithms

Neither method requires additional memory between **selection sort** and **insertion sort**

We **compare** sorting algorithms by examining the number of instructions executed by the sorting algorithm

the efficiency of binary search is **O(log2 n)**

```
enum Speed { FAST, MEDIUM, SLOW };
zero = FAST
```

exspetoin

A finally clause will execute in any circumstance

An exception can produce a "call stack trace" which lists: the active methods in the opposite order that they were invoked

NullPointerException and ArithmeticException are both derived from the RuntimeException class

unchecked exception requires no throws clause

checked exception requires a throws clause

When a program terminates because a thrown exception is not handled, the program outputs a message indicating what and where the exception was thrown

StringIndexOutOfBoundsException is for a string or array tries to get a value outside of the index of the object

this is NOT a way: throw the exception to a pre-defined Exception class to be handled

UML

In a UML diagram for a class & there may be a section containing the attributes (data) of the class & there may be a section containing the name of the class & classes are represented as rectangles

DEFF

instantiation creating a new object of the class

Polymorphism is achieved by overriding

flow of control The idea that program instructions execute in order (linearly) unless otherwise specified

actual parameters The expressions that are passed to a method in an invocation

DEFF (cont)

exception propagation call stack is The list of methods is known as the call stack and the method of searching them

0-9, \$, -, a-Z allowed in an identifier

(, {, [--- (< does not) needs an associated "closing" character

syntax gramer

semantics comperhentoin

base class child is a parent class or super class

this An object that refers to part of itself within its own methods can use this reserved word

super An object that access a parent class' constructor(s) , methods and instance data can use this reserved word

new reserved words in Java is used to create an instance of a class

LOOPS

The break statement transfers control out of the current control structure such as a switch statement

the do loop will always execute the body of the loop at least once, the while dose not

LOOPS (cont)

all three loop statements are functionally equivalent

while loops and do loops are essentially the same; but while loops always execute at least once

& if you know the number of times that a loop is to be performed, the best loop statement to use is a while loop

& loops may be replaced by an appropriate combination of if-else and switch statements

modifiers

public everyone can see

private only child can indirectly interact

protected only child can see

static static means it belongs to the class not an instance

abstract are used when defining: abstract classes, derived classes

final cannot be changed

