Hello World

```
/ Noc_Luppus /
import java.u  ti l.Date;
public class Hello
 {
        public static void
main(S tring[] args)
       {
              Sys tem.ou t.p -
rin tln ("100 100 = 10,000 &
1000 100 = 100,00 0");
     }
 } // 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 thenthe 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 clases 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

windowsis not a kind of object that is used to create a **g**raphical **u**ser **i**nterface 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 thrown 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 StringIndexO-utOfBoundsException becaus teh arry 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 betwwen **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

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exspetoins

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 arry trys to get a vule 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	is The list of methods is known as the *call stack* and the method of searching them
call stack	
0-9,$,-,a-Z	allowed in an identifier
(,{,[--- (< does not)	needs an associated "closing" character
syntax	gramer
semantics	comperhentoin
base class is a parent class or super class	child
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, thewhile 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 inderectly 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
finsl	cannot be changed

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