CSC201 Cheat Sheet

by NoxLupus (NoxLupus) via cheatography.com/46432/cs/14862/

Hello World

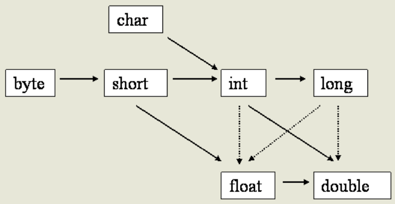
```
/* Noc_Luppus */
import java.util.Date;
public class Hello
 {
    public static void
main(String[] args)
    {
       System.out.println("100 *
100 = 10,000 & 1000 * 100 =
100,000");
   }
 } // dont forget me
```

Data Types

Primitive types	size	Reference types	size
byte	8	Byte	
short	16	Short	
int	32	Intager	
long	64	Long	
float	32	Float	
double	64	Double	
char	16	Charter	
bool	8	Boolean	
		All classes are reference type like: Scanner, Random, Die, int[], String[]	
holds value		holds a **pointer** to a value	

- *Term primitive is used with several meanings:*
- Provided as part of language
- Not composite (ie no component parts)
- Variable stores value
- Variable is not a pointer to the value
- Autoboxing is the automatic creation of a wrapper object from its corresponding primitive type

data convertoin



- Solid lines lose no information
- Dotted lines may lose precision (but not magnitude)
- Chars are unsigned 16 bit values, shorts are signed 16 bit values
- A narrowing conversion of a value of an integer type simply truncates the value

DecimalFormat

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

Java.text's NumberFormat dose not truncate their display during the formatting process

```
DecimalFormat fmt=new
DecimalFormat("0.######);
```

strings

String objects' lengths never chang and the shortest string has zero length

- Strings: have a .length() method (vs args.length field)
- Strings are dynamic and immutable
  - Each version of s is newly allocated
  - Mutable strings do exist
- Strings are not arrays of characters
  - Although a String does contain an array of characters

Class Math

•Clients of Math can access its members using the class rather than objects

•Static members can be accessed using either the class or an object

•sqrt and PI are declared as static

enumeration

Consider the following enumeration

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

`Speed.charAt(0)` = FAST

`Speed.charAt(1)` = MEDIUM

`Speed.charAt(2)` = SLOW

enumerations are like a sting of things, but they are unchangeable and, can be referenced by number

javafx comands

Rectangle name= new Rectangle(x, y, <>x, <>y);	rectangle upper-left corner is at coordinates (x, y) and its dimensions are <>x X <>y
Circle name= new Circle(x, y, r);	circle, centered at coordinates (x, y) and ridus of r
name.setStrokeWidth(2);	sets the size of the lines
name.setFill(Color.GREEN);	fills the shape with a color

JavaFX Qs

The individual items held within the JavaFX scene graph are known as nodes. root = first, branch = parent, leef = child

Parent, group, and stackPane nodes can be used as a root node in a JavaFX

The javafx.scene.shape packages includes classes that represent shapes in JavaFX

Event, control, and event handler are a kind of object that is used to create a **g**raphical **u**ser **i**nterface

You should override the start method in a JavaFX Application

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

A color image is broken down into individual pixels (points), each of which is represented by RGB

The coordinate of the upper-left corner of a stage is 0,0

arrays

DataType[] name = new DataType[x];	crates a array, lanth x, DataType = int, string, char, object...ect, index = 0 - x-1
a(int arrays) = **b**(int array);	will create an alias of b
"off-by-one" error	a loop gose +- too many times
ArrayIndexOutOfBoundsException	when the input is out of bounds like: arr[-1] = 0;

an int array is passed as a parameter to a method, (int[ ] a) would adequately define the parameter list for the method header

sorting algorithms

We compare sorting algorithms by examining the number of instructions

the amount of memory required by selection sort and insertion sort, neither method requires additional memory

selection sort: O(n2) time complexity

insertion sort: dose one item at a time. It is much less efficient on large

binary search: O(log2 n) efficiency

classes

• Everything in Java is declared inside a class
• Packages are collections of classes
• Multiple classes per file allowed. But only one public class per file
• If a file contains a public class, the file must have the same name as the public class
• Careful: What do we mean when we refer to the class Hello?
• Classes are the only structured or user-defined types
In addition to their usage providing a mechanism to convert (to box) primitive data into objects, the wrapper classes provide static constants

classes (cont)

All classes must have 1 parent (other than the object class with has no parent) but may have any number of children (derived or extended) classes

The relationship between a class and an object is best described as objects are instances of classes witch is created by the reserved word **new**

Java Classes' Purposes

•Template for creating objects
•Type for (reference) variables
•Encapsulation mechanism (eg visibility control)
•Library of routines and constants

Objects

Objects serve two purposes:

1. Objects model entities in real world (eg students, books)
2. Objects are instances of abstract data types (eg stacks and queues)

Objects typically described as having 3 characteristics:

1. State: Data
2. Behavior: Actions the object can take, perhaps modifying data
3. Identity: Objects are distinct (even if data is the same) and can be distinguished

Programming with objects involves

Creating objects
Sending them messages

Consider modeling a library's books
1. State: Author, title, status, ...
2. Behavior: getTitle, hold, checkout, return
3. Identity: Object of each book
Hmmm, multiple copies???

Methods

• **Important rule:** *Static methods can call static methods only*
• **Instance methods** are declared without keyword static
• **Private** methods are not visible outside the class

Methods (cont)

• **Method** declarations methods are declared inside classes, not other methods (i.e., no nested methods)
• Having multiple class methods of the same name but differing types or numbers of variables **method overloading**
•**Static** methods can not reference instance data
•methods define the object's behavior

Abstract

Abstract methods are used when defining: abstract classes, derived classes

variable

In Java a variable may contain a value or a reference not a class, method, or package

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

a Java identifier can contain only A-Z, a-z, 0-9, _ and $, and start only with one of A-Z, a-z, or $.

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

Literals

```
(2 > 3) ? true : false;
"text".substring(2);
System.out.println("Display a hard
coded float: " + 37.19f);
```

The code section 3.62 contains two number literals followed by two boolean literals at line 1, one string literal followed by one number literal at line 2, and one string literal followed by one real number literal at line 3:

Instance Variables

Variables length and width are called instance variables

Each instance of the class gets a copy

Instance Variables are also called fields

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

Scope: Entire class (and beyond, if not private)

Declared inside class but not inside any method

Instance variables should always be declared private

```
public class Box{
int foo = 5;
int bar = 10; }
```

default values

integer type: 0
floating point type: 0.0
type boolean: false
type char: null character (\u0000)
reference type: null
array references: null

Program Development

establishing the requirements	**what**
creating a design	**how** determine the classes and objects needed
implementing the code	least creative step
testing the implementation	goal: to find logical and run-time errors

simbles

comments	.
// one line	method(args) sum(int1, int2)...
/* multi */	++ adds one
/** javadoc */	+ adding
	/ + % divition + remainder
	^= |= &= >> = >>>=

Terms

Packages	are collections of classes
class	everthing is writen with in a class, blue print of object
object	an instance of a class
Method	main is a method (ie procedure or function)
Member	Methods are one of the kinds of members that can be in a class
Access modifier	specifies visibility
Kernighan and Ritchie (K & R) style	stase nl.starts nl.code end
Allmann style	nl.stase nl.starts nl.code end
camel style	(eg doSomethingBig()) Variables, methods, packages
capitalized	(eg Hello) classes
all_uppercase	CM_PER_INCH = 2.54; Constants
instantiation	means creating a new object of the class or a new alias of a object
alias	two different numeric variables refer to the same physical object
API	Application Programming Interface
flow of control	the idea that code runsright though onless told other wise
arrays	are objects

Precedence

postfix	. [ ] method(args)
unary	++ -- + - new (type)
multiplicative	* / %
additive	+ -
assignment	= += -= *= /= %= ^= &= |= <<= >>= >>>=

Constructors

• Constructor has same name as class
• No return type for constructors
•Possible to have method and constructor with same name!
• Default no parameter constructor provided if no other constructors are provided
• Default constructor is NOT provided if others are (which can cause problems in some circumstances)
• Constructors override initializations in declarations

Declare

public	everyone can see
privet	only child can inderectly interact
protected	only child can see
static	static means it belongs to the class not an instance
final	cannot be changed

Access modifiers: public, protected, and private
Modifier **requiring override**: abstract
Modifier restricting to **one instance**: static
Modifier **prohibiting** value **modification**: final

final double CM_PER_INCH = 2.54;
----
final double CM_PER_INCH;
CM_PER_INCH = 2.54;
----
public static final double PI = 3.1415;

CSC201 Cheat Sheet

by NoxLupus (NoxLupus) via cheatography.com/46432/cs/14862/

Object Assignment and Garbage

- Object variables are always references
- Assignment assigns references
- Java has automatic garbage collection

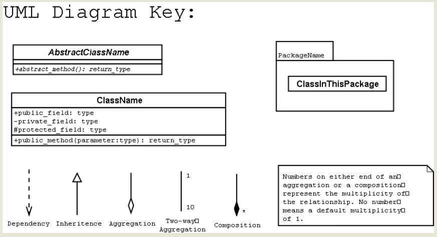
Inheritance

- Inheritance through an extended (derived) class supports code reuse
- All classes in Java are directly or indirectly subclasses of the “Object” class
- “the default constructor”, “equals” and, “toString” are a method of the Object class
- Using the reserved word, **super**, one can access a parent class' constructor(s) , methods and instance data
- An object that refers to part of itself within its own methods can use **this** reserved words to denote this relationship

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

parent class	child class
base class	driver class
super class	extended class

Unified Modeling Language



Numbers on either end of an aggregation or a composition represent the multiplicity of the relationship. No number means a default multiplicity of 1.

Loops

all three loop (do, while, for) statements are functionally equivalent

while(x==y) { stuff}	as long as teh conditoin is true it will run
do{ stuff }while (x!=y)	the do loop is the same as the while exsept it will exacte at lest once

Loops (cont)

for(x;y; z){ stuff}	x = inst; y = condistoin; z = chang; it checks the condishtoin then dose the chang

Loop Sitet

object-oriented programming

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

Polymorphism: achieved by overriding

inheritance:

polymorphism: