CSS 142 C

Lecture 1

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TODAY'S CONTENT

1. **Introduction**

   - **What this course is about**

   - **Administrivia (aka, how do we work together)**

2. **142 Overview**

3. **Affinity Exercise**

4. **Intro to the course (Savitch 1.1; 1.2)**

   - **Computer organization**

   - **printing, assignment, simple statements.**

5. **Reading for Wednesday: Savitch 1.1, 1.2, 1.4.**   Optional 4.1 (pp.174-185)

INTRODUCTION

About Course

About me

Administrivia

Course Catalog Description: Knowledge Areas

This course will introduces you to **programming concepts** within social, cultural, scientific, mathematical, and technological context.

Topics include programming **fundamentals** (control structures, data types and representation, operations, functions and parameters), **computer organization**, **algorithmic thinking**, introductory **software engineering concepts** (specifications, design, testing), and **social and professional issues**.

- Co-requisite: CSSSKL 142.

Course Catalog Description: Skills and Competencies

Goals

- Develop competencies associated with **problem-solving**, **design**, **programming**, and **testing** techniques.

- Recognize **common applications** and consider these applications in society.

- Learn and use good **software engineering** and **algorithm analysis** techniques.

- Take advantage of **online resources** and "grow in **learning how to learn**" on your own

Course Requirements & Prerequisites:

- To be adequately prepared to give it your best:

  - CSS 142 is required your commitment to succeed and open mind to learn

- Concurrent enrollment in **CSSSKL 142** is also required.

  - Has to pass the labs with CR

  - Lab groups: Fridays

REQUIREMENTS and WORKLOAD

- Assignments (8)   25 %

- Midterms (2)   40 %

- Final Exam   25%

- Activity and Tasks (8)   10%   work in class; mainly pairs | Reading

- Participation   X%   eXtra work => eXtra points

Please note, you must receive a grade of 2.7 in 142 in order to take CSS 143

More details are in the course syllabus and our Canvas web site:

- https://canvas.uw.edu/courses/1210433

WORKLOAD

- In the beginning: Review + Definitions, Definitions, Definitions

    - Then practical applications

- Reading | Self-learning: Expectations for a 5 credit class is 10++ hours

- Homework (8); HW1 is online next week

- Schedule of HW and Exams are online

- CSSSKL 142 Labs: 2.5 hours + lab assignment **every week**

WORKLOAD: Schedule

Activities and Tasks — 10% of Total

Hands-on Activity 1 (HoA1)
Not available until Mar 28 | Due Mar 28 at 1pm | 3 pts ✓

HoA2
Not available until Apr 4 | Due Apr 4 at 1pm | 3 pts ✓

HoA3
Not available until Apr 11 | Due Apr 11 at 12:50pm | 3 pts ✓

HoA4
Not available until Apr 25 | Due Apr 25 at 1pm | 3 pts ✓

HoA5
Not available until May 9 | Due May 9 at 1pm | 3 pts ✓

HoA6
Not available until May 16 | Due May 16 at 1pm | 3 pts ✓

HoA7
Not available until May 23 | Due May 23 at 1pm | 3 pts ✓

Task 1: SE Ethics I
Not available until Apr 17 | Due May 1 at 11:59pm | 5 pts ✓

Task 2: SE Ethics II
Due May 1 at 11:59pm | 5 pts ✓

Task 3: SE Ethics III
Due Jun 3 at 11:59pm | 5 pts ✓

FoR1
Available until Mar 28 | Due Mar 28 at 9am | 2 pts ✓

FoR2
Available until Apr 2 | Due Apr 2 at 9am | 2 pts ✓

And there are FoRs - Feedback on Reading

Assignments — 25% of Total

Homework 1
Due Apr 5 at 11:59pm | 30 pts ✓

Homework 2
Not available until Apr 2 | Due Apr 12 at 11:59pm | 30 pts ✓

Homework 3
Not available until Apr 9 | Due Apr 19 at 11:59pm | 30 pts ✓

Homework 4
Not available until Apr 11 | Due Apr 26 at 11:59pm | 30 pts ✓

Homework 5
Not available until Apr 18 | Due May 6 at 11:59pm | 30 pts ✓

Homework 6
Not available until Apr 25 | Due May 10 at 11:59pm | 30 pts ✓

Homework 7
Not available until May 2 | Due May 24 at 11:59pm | 30 pts ✓

Homework 8
Not available until May 16 | Due May 31 at 11:59pm | 30 pts ✓

Coffee Project (bonus)
Not available until May 24 | Due Jun 8 at 9am ⊘

Midterms — 40% of Total

Midterm 1
Due Apr 16 at 11am | 100 pts ✓

Midterm 2
Due May 14 at 11am | 100 pts ✓

Final Exam — 25% of Total

Final Exam
Due Jun 4 at 11am | 100 pts ✓

> The exam dates are cast in-stone.
> During the class time:
> 120 mins

Lab Content: some topics might be different

| WEEK	TOPIC
1	IDE intro, fixing syntax errors, print statements and simple methods
2	The Scanner class and writing more advanced methods
3	Branching and Boolean expressions
4	Strings and looping
5	More loops and debugging
6	File I/O and intro to classes and objects
7	More classed and objects
8	Arrays and programming with arrays
9	Multidimensional arrays, ragged arrays
10	Putting it all together!

PCs are provided

How To Succeed in 142

- Understand the **7/28** and **10K hour** theories,

    - **7:** understand how your memory (short vs long) works and don't get frustrated that you need to repeat / review multiple times

    - **28:** Do it every day until it becomes auto-pilot activity

    - **10K:** Become a Zen Master!

- and apply this to your study in 142
    - Next two slides give you some suggestions

Short-term vs. Long-term Memory

OUTLIERS MATTER
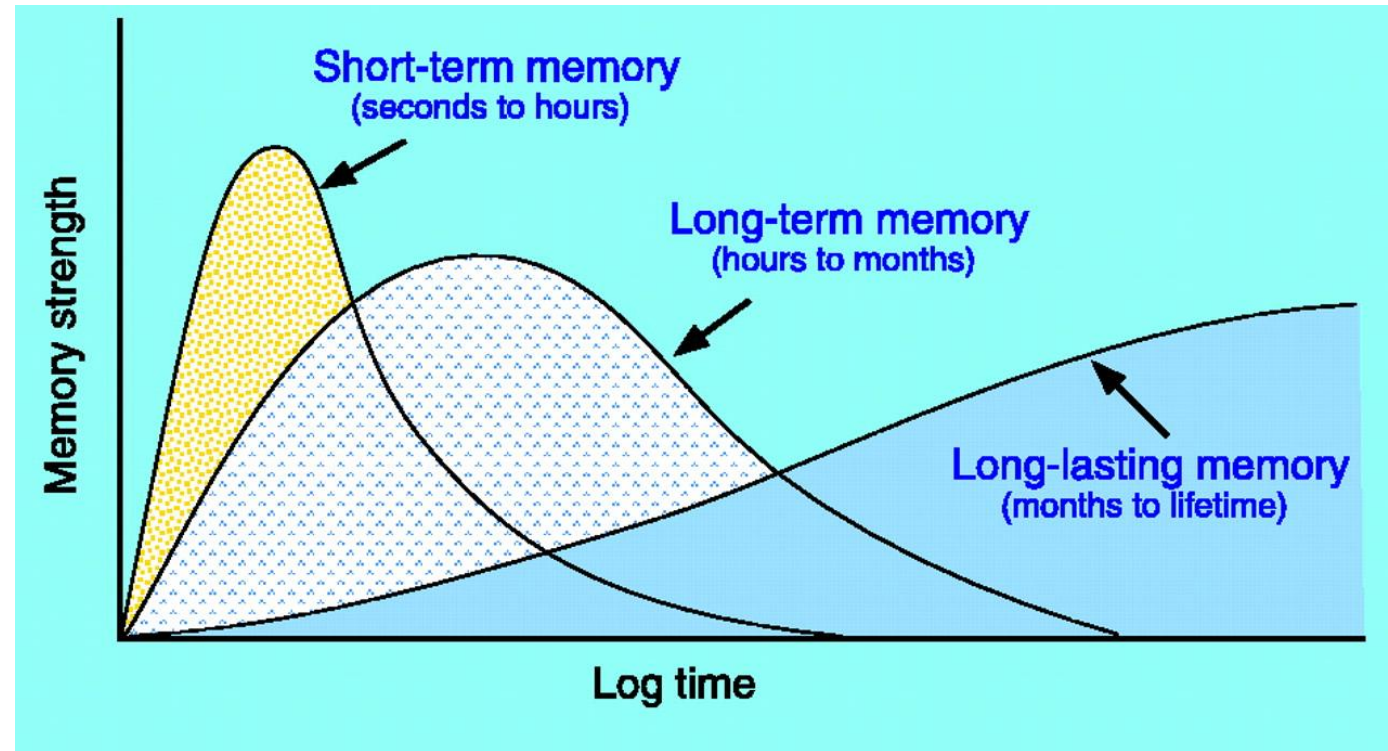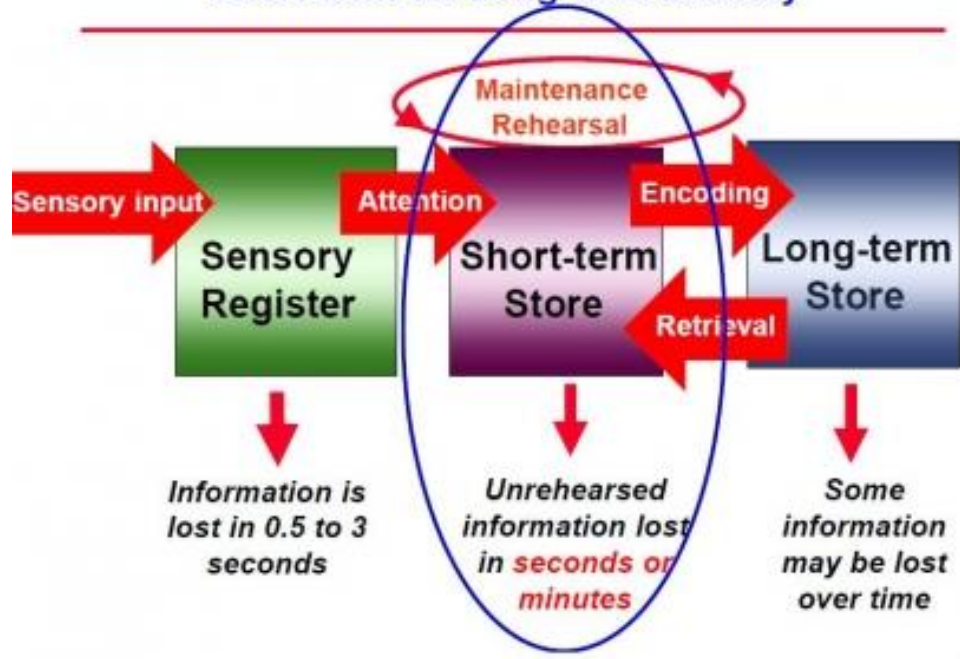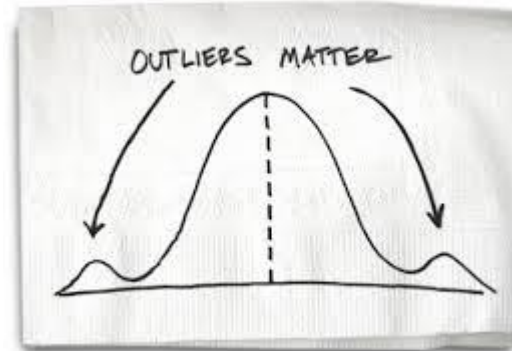
How To Succeed in 142

- Keep pace with the aggressive reading schedule
  - Read the text **before** coming to class and then **after**
- Web search the topics covered
  - As the text will not cover all subjects equally
  - Use www.docs.oracle.com, stackOverflow, and our site
- Get a **"lab buddy"** who will…
  - Work on labs together
  - Study for midterms in a group
  - Take notes if you miss class
- See me during office hours or after class

More Tips

- **Code every day**

  - Write a program to manage your finances + schedule reminders

  - Get a main() running this week

- Code topics we're covering

- Code what you understand and don't understand

- Use tools and the debugger

- Use the class website & message board

  - Example: Topic lists for exams tend to be exhaustive

- Get a coding buddy for labs and study (see **agile/extreme programming**)

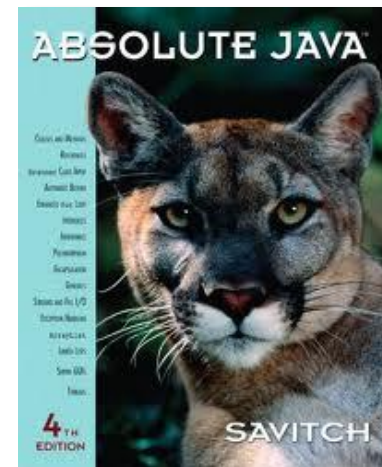- HOWEVER, your **homework assignments are individual work**

TEXTBOOK
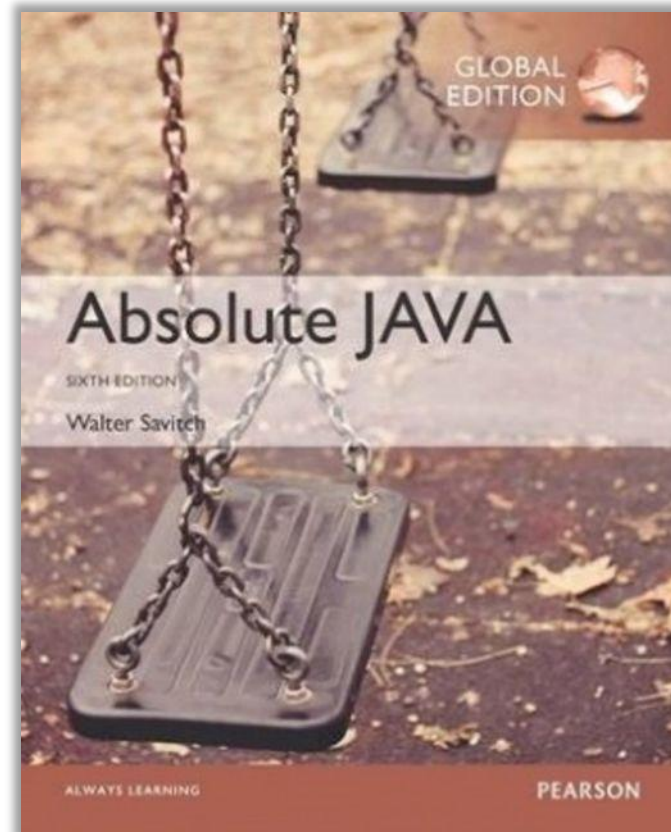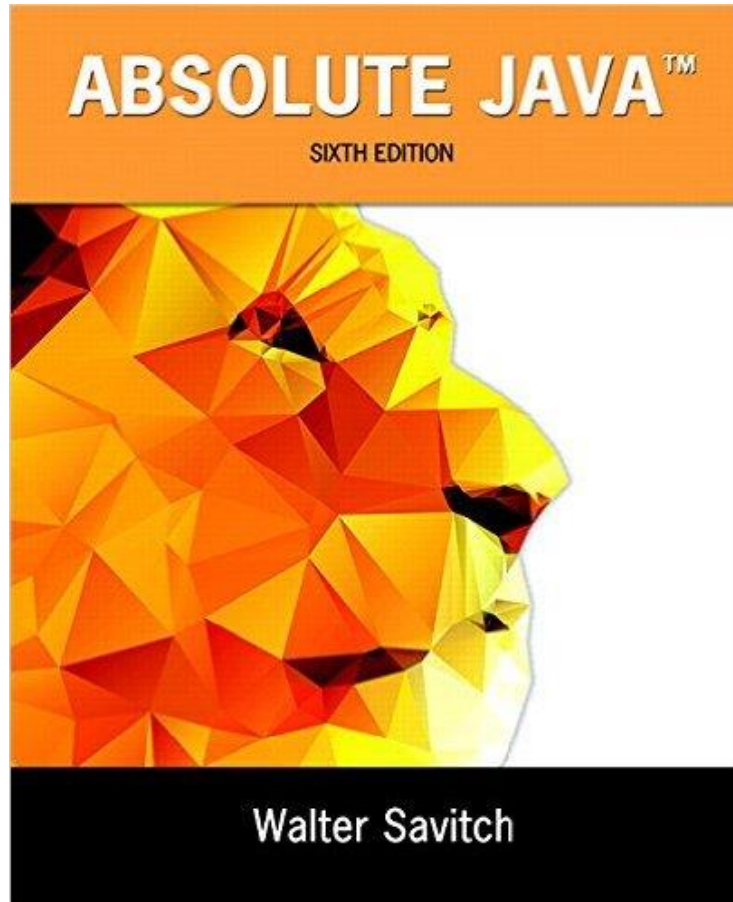
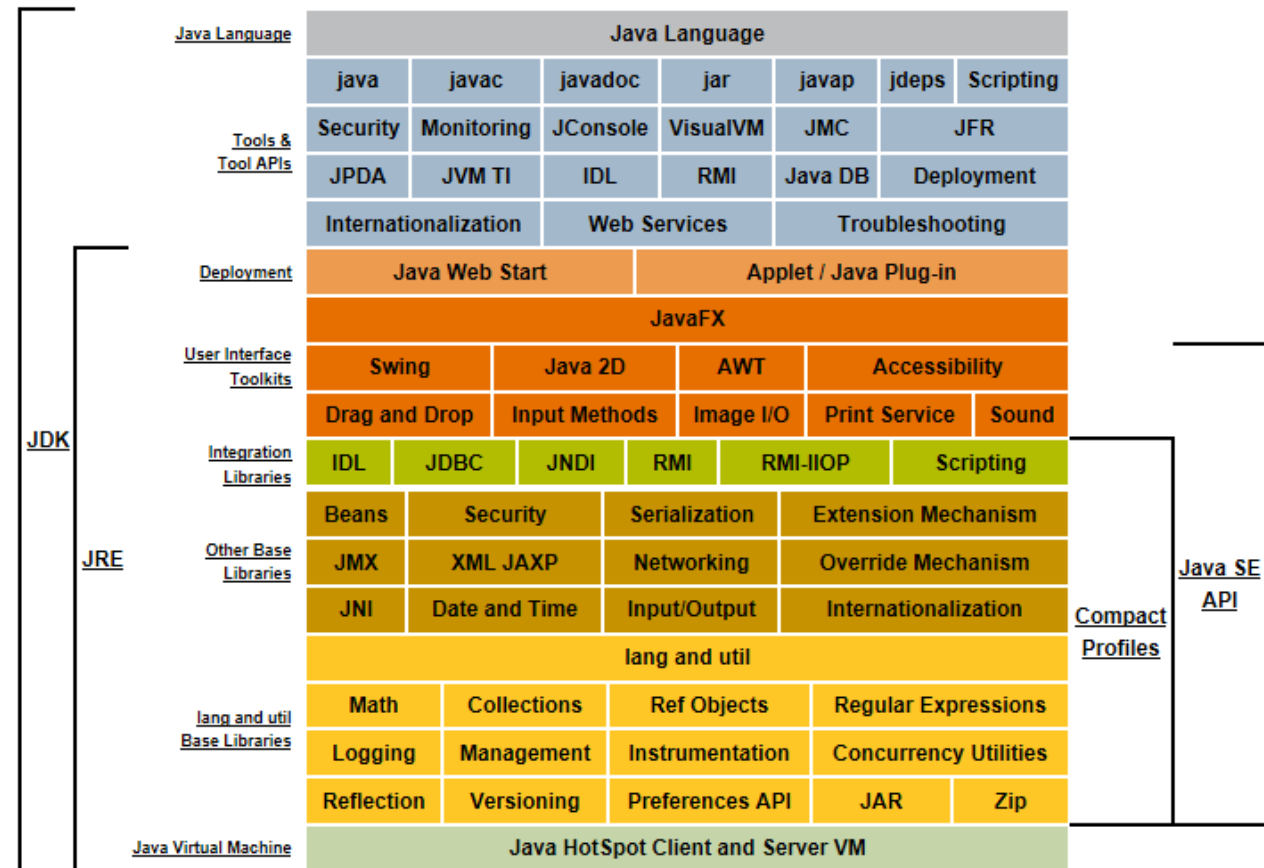Ice Cream is Okay too…
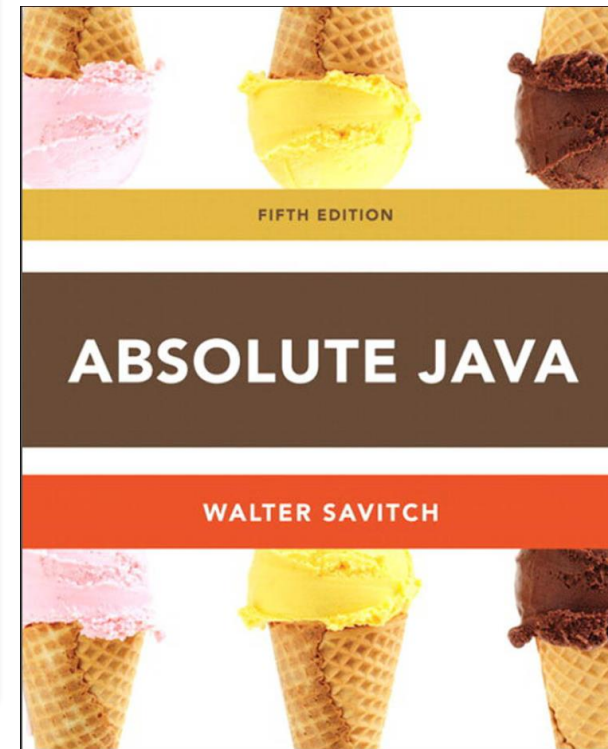
not good

History…

Java Platform Standard Edition 8 Documentation

Oracle has two products that implement Java Platform Standard Edition (Java SE) 8: Java SE Development Kit (JDK) 8 and Java SE Runtime Environment (JRE) 8.

JDK 8 is a superset of JRE 8, and contains everything that is in JRE 8, plus tools such as the compilers and debuggers necessary for developing applets and applications. JRE 8 provides the libraries, the Java Virtual Machine (JVM), and other components to run applets and applications written in the Java programming language. Note that the JRE includes components not required by the Java SE specification, including both standard and non-standard Java components.

The following conceptual diagram illustrates the components of Oracle's Java SE products:

Description of Java Conceptual Diagram

http://docs.oracle.com/javase/8/docs/

Java Language	Java Language						
Tools & Tool APIs	java	javac	javadoc	jar	javap	jdeps	Scripting
	Security	Monitoring	JConsole	VisualVM	JMC	JFR	
	JPDA	JVM TI	IDL	RMI	Java DB	Deployment	
	Internationalization		Web Services		Troubleshooting		
Deployment	Java Web Start		Applet / Java Plug-in				
User Interface Toolkits	JavaFX						
	Swing		Java 2D		AWT	Accessibility	
	Drag and Drop		Input Methods		Image I/O	Print Service	Sound
Integration Libraries	IDL	JDBC	JNDI	RMI	RMI-IIOP	Scripting	
Other Base Libraries	Beans	Security		Serialization		Extension Mechanism	
	JMX	XML JAXP		Networking		Override Mechanism	
	JNI	Date and Time		Input/Output		Internationalization	
lang and util Base Libraries	lang and util						
	Math	Collections		Ref Objects		Regular Expressions	
	Logging	Management		Instrumentation		Concurrency Utilities	
	Reflection	Versioning		Preferences API		JAR	Zip
Java Virtual Machine	Java HotSpot Client and Server VM						

JDK

JRE

Compact Profiles

Java SE API

SHORT SURVEY about you

1. Did you take a programming class before?

   – *Note*: no experience necessary (or expected)

2. Do you know Java?

3. Other languages?

4. Did you take 142 before?

5. What IDE do you use?

6. Do you have GitHub account?

7. Do you have Stack Overflow / Stack Exchange account?

8. Do you have Hacker Ranks / Interview Street account?

About Me

❖ **Academia**

    ❖ Doctor of Science , Computer Aided Design, Technion, Israel

    ❖ Formerly, Professor, Glasgow Caledonian University, Scotland, UK

❖ **Industry**

    ❖ Air Force | Corps of Engineers | officer

    ❖ Microsoft (2000-2013), Redmond

        ❖ Windows OS; Developer Division; Business Development; Tech Evangelism

❖ **Tech Startup and Consulting**

    ❖ Kitovet | DevDraft (2013-2014), Seattle

        ❖ Member of founding team

    ❖ AR Consulting (2013 – 2016), Bellevue

        ❖ Principal

    ❖ Litesprite (2015 – 2016), Seattle

        ❖ CTO

            ❖ Game development

My teaching at UW

- ❖   Programming CSS 107
- ❖   Programming Methodology CSS 142/161
- ❖   Java Programming Labs CSSSKL 132, 142/161
- ❖   Programming Methodology CSS 162
- ❖   Programming Methodology CSSSKL 162
- ❖   Community Teaching CSS 295

- ❖   Data Structures, Algorithms and DM CSS 342
- ❖   Management Skills for Software Professionals CSS 350
- ❖   Software Engineering CSS 360
- ❖   3D Computer Graphics CSS451
- ❖   Software Project Management CSS 461
- ❖   Databases CSS 475
- ❖   CSSE Capstone CSS 497

- ❖   Software Engineering: Design and Modeling CSS 506 / 507 / CSS 508

MY LEARNING PHYLOSOPHY

I hear and I forget.

I see and I remember.

I do and I understand.

Confucius
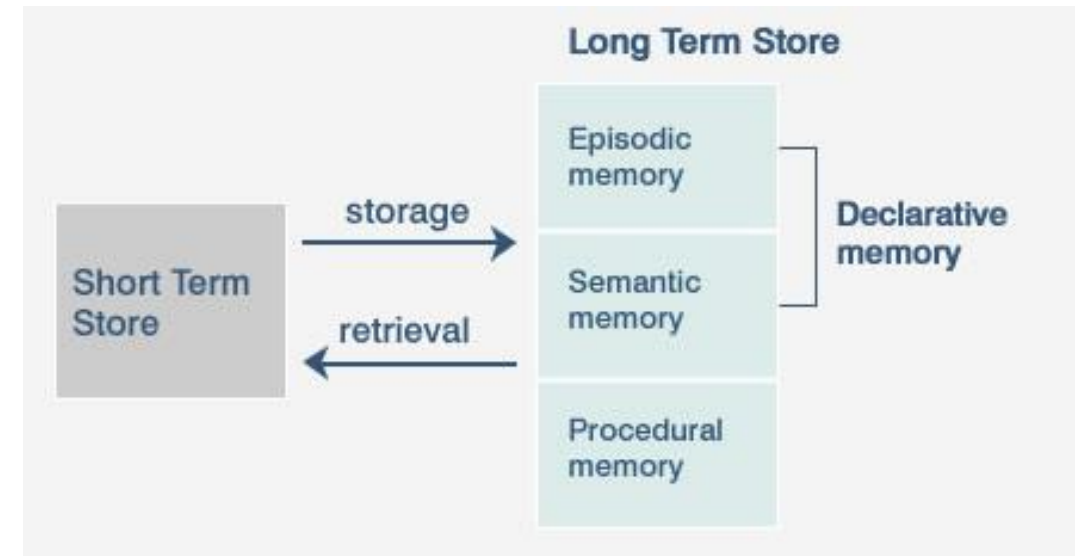
MY APPROACH

- **To learn swimming, you have to swim.**

- **PRACTICE, PRACTICE, PRACTICE** [7/28 and 10K hours theories]
  - Short- and Long-term memory
  - *Outliers* by Malcolm Gladwell

- **LEARNING FROM MISTAKES [mine, friends and YOUR OWN]**

- **Learning in teams of two**   (Agile SwE | Extreme programming)

- **Multi-lingual (speech | programming) paradigm**

Tell me about your expectations from this course?

Affinity exercise

What do you **expect** / **want** from this course?

Affinity exercise:

5 minutes: Write down your input (1 per post-it)

   = < 3 per person

1 minutes: Place post-its on board

3 minutes: Group post-its together

2 minutes: Name groups (regroup as needed)

1 minutes: Add more post-its (regroup as needed)
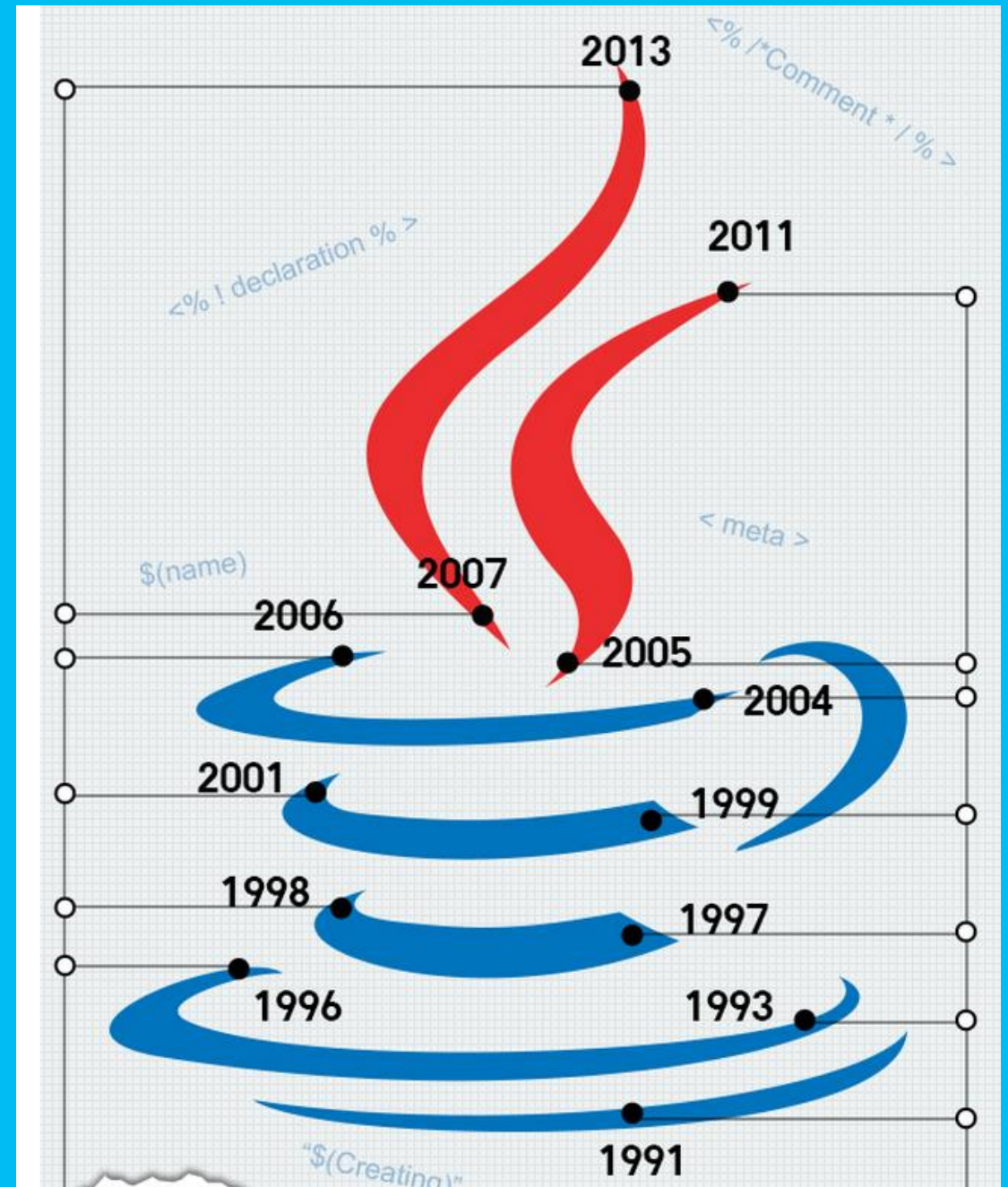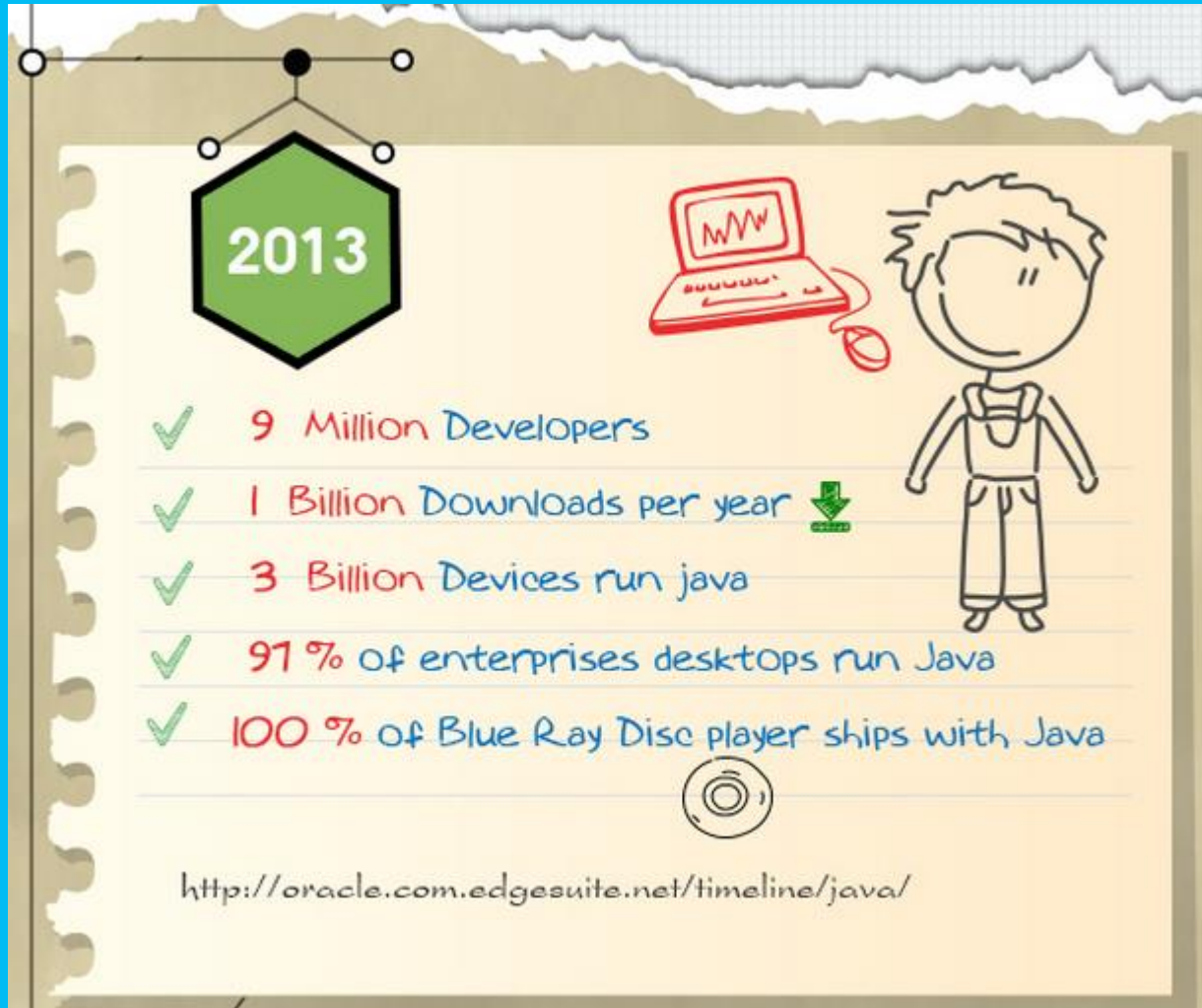
3 minutes: Capture results
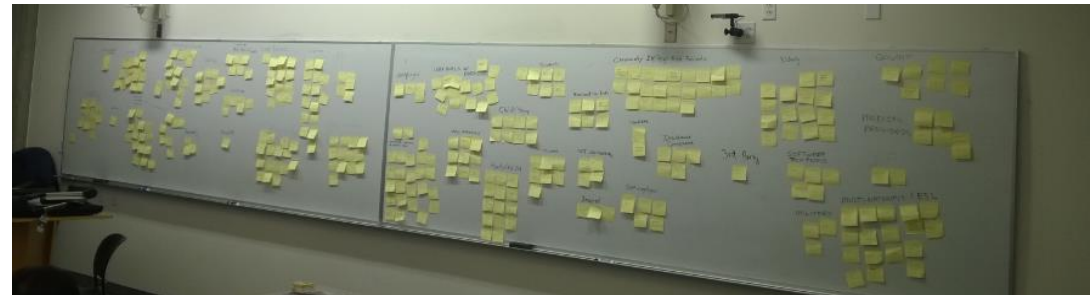
Intro to the course

- **Computer organization**
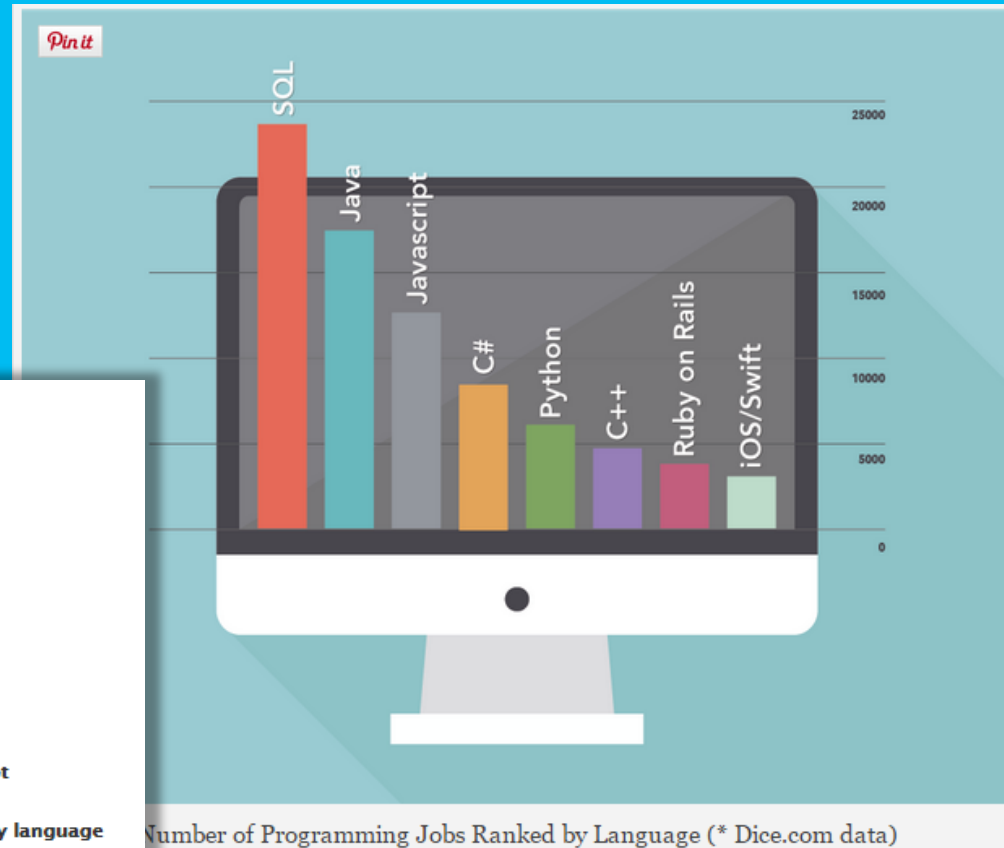
- **printing, assignment, simple statements.**
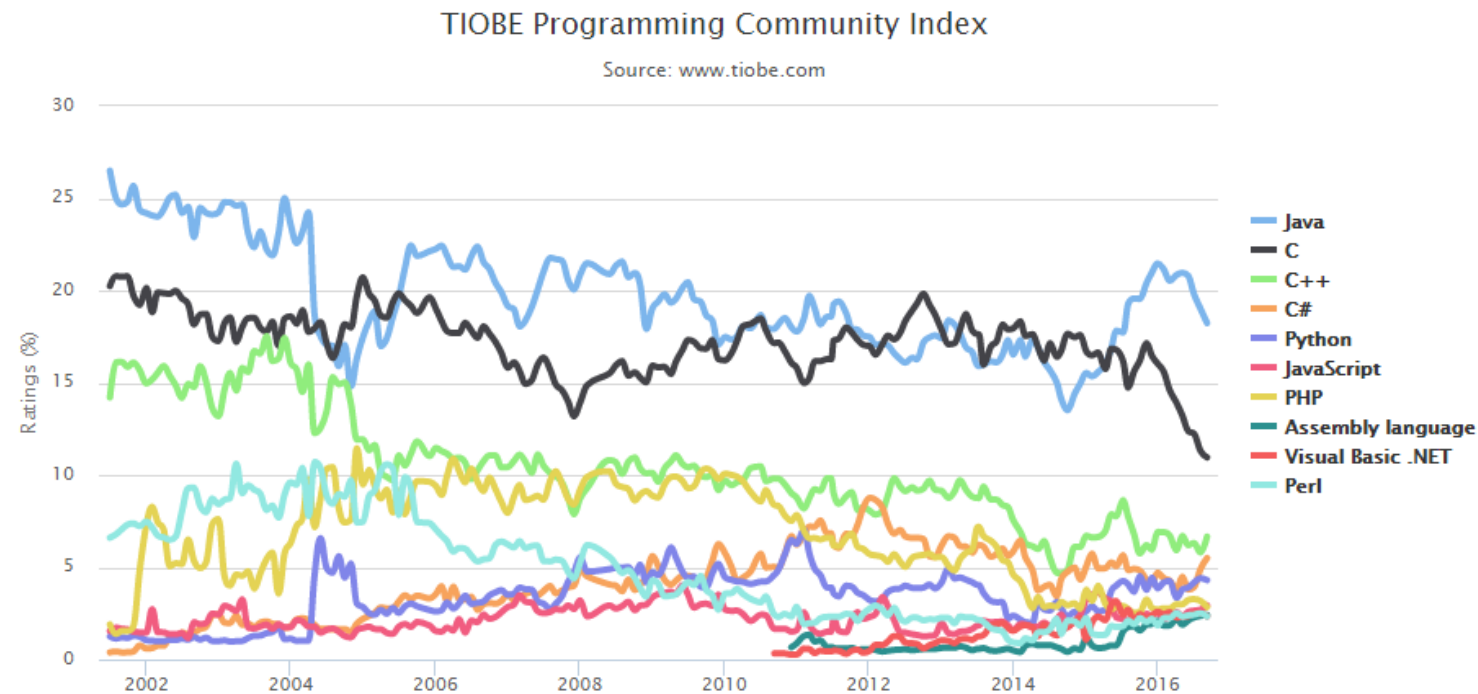
➜ **Savitch 1.1; 1.2**

Why Java?

2013

✓ 9 Million Developers
✓ 1 Billion Downloads per year
✓ 3 Billion Devices run java
✓ 97% of enterprises desktops run Java
✓ 100% of Blue Ray Disc player ships with Java

http://oracle.com.edgesuite.net/timeline/java/

2013
2011
2007
2006
2005
2004
2001
1999
1998
1997
1996
1993
1991

<%!/*Comment */ %>
<%! declaration %>
< meta >
$(name)
"$(Creating)"

TIOBE Index: # of developers

Sep 2016	Sep 2015	Change	Programming Language	Ratings	Change
1	1		Java	18.236%	-1.33%
2	2		C	10.955%	-4.67%
3	3		C++	6.657%	-0.13%
4	4		C#	5.493%	+0.58%
5	5		Python	4.302%	+0.64%
6	7	^	JavaScript	2.929%	+0.59%
7	6	v	PHP	2.847%	+0.32%
8	11	^	Assembly language	2.417%	+0.61%
9	8	v	Visual Basic .NET	2.343%	+0.28%
10	9	v	Perl	2.333%	+0.43%
11					
12					

TIOBE Programming Community Index

Source: www.tiobe.com

Ratings (%)

- Java
- C
- C++
- C#
- Python
- JavaScript
- PHP
- Assembly language
- Visual Basic .NET
- Perl

Number of Programming Jobs Ranked by Language (* Dice.com data)

Coding dojo: # of jobs

Why Java?

…and what about JavaScript?

Fundamentals of Computer Programming

- **What is a program?**

Fundamentals of Computer **Programming**

- What is a program?
- **What is programming?**

Fundamentals of
Computer Programming

- What is a program?
- What is programming?
- **What is a computer program?**

Fundamentals of
Computer Programming

- What is a program?
- What is programming?
- What is a computer program?
- **What is computer programming?**

Display 1.1 A Sample Java Program

Name of class (program)

The main method

```java
1   public class FirstProgram
2   {
3       public static void main(String[] args)
4       {
5           System.out.println("Hello reader.");
6           System.out.println("Welcome to Java.");

7           System.out.println("Let's demonstrate a simple calculation.");
8           int answer;
9           answer = 2 + 2;
10          System.out.println("2 plus 2 is " + answer);
11      }
12  }
```

input

⬇

PROCESS

⬇

output

SAMPLE DIALOGUE 1

```
Hello reader.
Welcome to Java.
Let's demonstrate a simple calculation.
2 plus 2 is 4
```
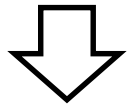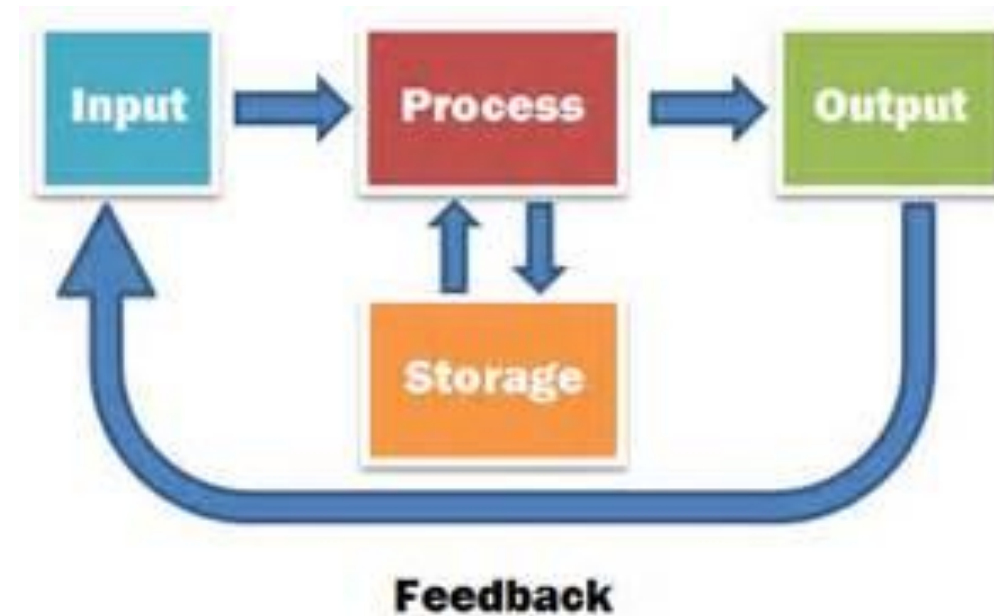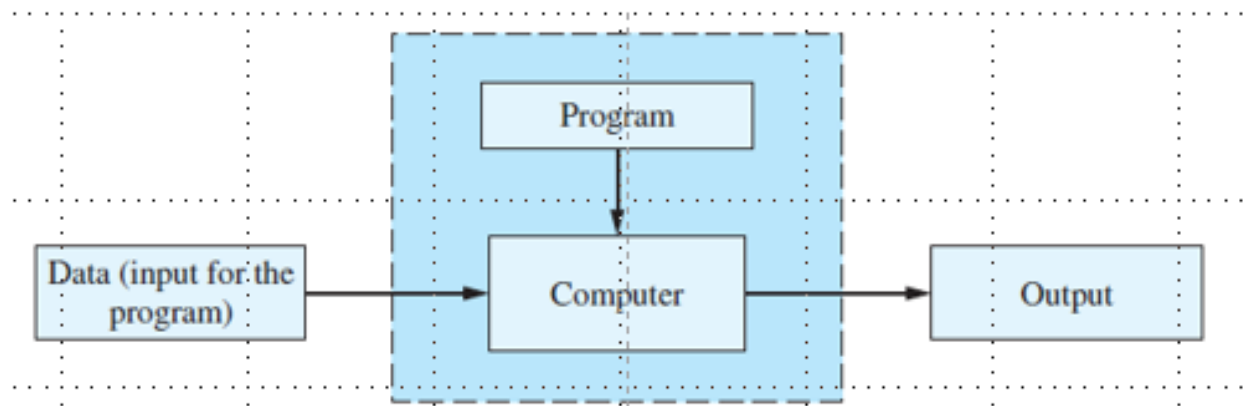
Program -> Programming -> Computing

Origins of Java

James Arthur Gosling, OC (born May 19, 1955) is a Canadian computer scientist, best known as the father of the Java programming language

James Gosling received a Bachelor of Science from the University of Calgary and his M.A. and Ph.D. from Carnegie Mellon University

James Gosling, Mike Sheridan, and Patrick Naughton initiated the Java language project in June 1991. Java was originally designed for interactive television, but it was too advanced for the digital cable television industry at the time.

The language was initially called Oak after an oak tree that stood outside Gosling's office. Later the project went by the name Green and was finally renamed Java, from Java coffee.

Cosling designed Java with a C/C++-style syntax that system and application programmers would find familiar
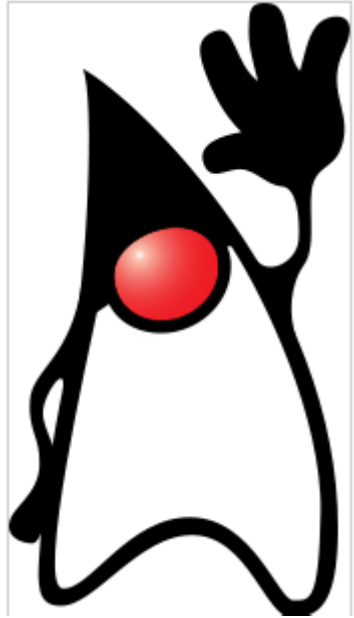
Origins of Java

- Created in 1991 by James Gosling at Sun Microsystems

  - First called Oak, then Green, then Java

- Designed for programming home appliances, needed to work on different processors (concept known as WORA – **write once, run anywhere**")

- Uses a two step translation process:

  - in the first step code is translated into Java byte-code before being translated into machine code

Java

- Goal:
  - Write once, run anywhere
  - **JDK**: Java Developers Kit
  - **JRE:** Java Runtime Environment
- Editions
  - **SE: Standard Edition**
  - EE: Enterprise Edition
  - ME: Micro Edition (mobile, embedded)
  - Embedded: flash memory, closed systems

Downloading Java [optional]

- http://www.**java**.com/get**java**/
  - Current: Version 8 update xxx*
  - We will be writing Java, so we want **JDK**
  - Which includes **JRE**

Latest release update is 161.   We are Okay with lower update versions too, if you already using one with IDE

https://java.com/en/download/

Integrated Development Environment (IDE)

- Programming tools

  - Edit text (code) + compile + run

  - Graphical representations of components

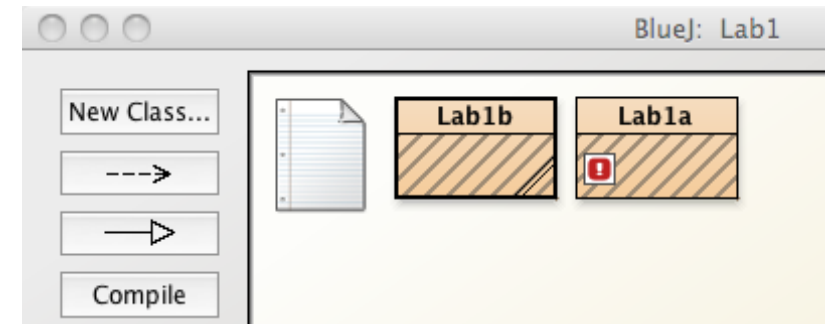- We'll be using Eclipse and BlueJ, but you can use others
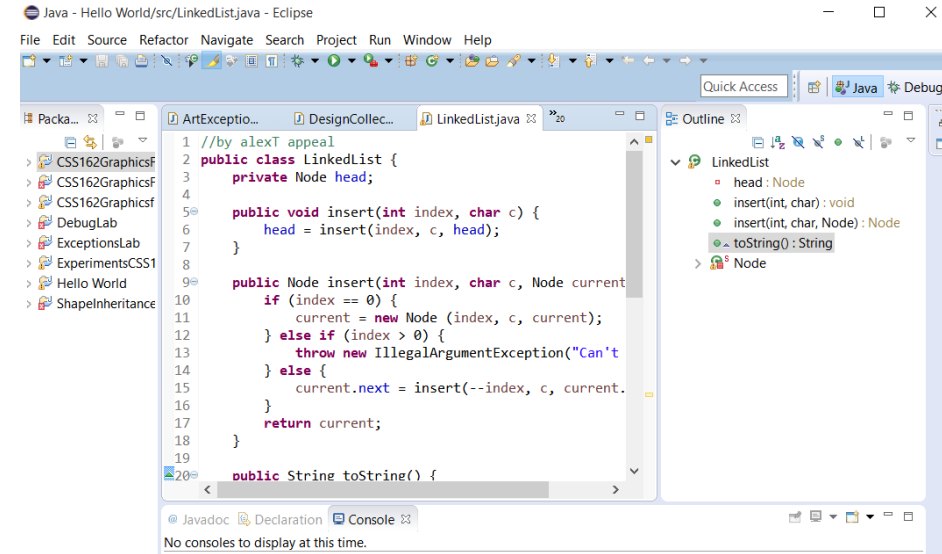
bluej.org   eclipse.org   netbeans.org

BlueJ

A free Java Development Environment designed for beginners, used by millions worldwide. Find out more...

"One of my favourite IDEs out there is BlueJ"
— James Gosling, creator of Java.

● ○ ○

Created by **University of Kent**

Supported by **ORACLE**

Download and Install

Version 3.1.5, released 29 March 2015 (what's new)

Windows

BlueJ Combined Installer (includes JDK) OR 1. Oracle JDK
2. BlueJ Installer

Mac OS X

10.7[Lion].3 and newer:
BlueJ Installer
(includes Oracle JDK)

OR

10.7[Lion].2 and older:
BlueJ Installer
(uses Apple JDK)

http://www.bluej.org

Try the Eclipse Installer NEW

The easiest way to install and update your Eclipse Development Environment.

FIND OUT MORE ⌄

Mac OS X	Windows	Linux
⬇ 64 bit	⬇ 32 bit | 64 bit	⬇ 32 bit | 64 bit

...or download an Eclipse Package

Eclipse IDE for Java EE Developers

269 MB   3,071,098 DOWNLOADS

Tools for Java developers creating Java EE and Web applications, including a Java IDE, tools for Java EE, JPA, JSF, Mylyn...

Windows
⬇ 32 bit | 64 bit

Enterprise-Class BIRT Report Server (Free, Not a Trial)

Instantly enhance your Eclipse BIRT reports with interactive, real-time analytics that can be seamlessly embedded into web and mobile apps.

★
Promoted
Download

Eclipse IDE for Java Developers

163 MB   1,737,135 DOWNLOADS

The essential tools for any Java developer, including a Java IDE, a Git client, XML Editor, Mylyn, Maven integration and WindowBuilder...

Windows
⬇ 32 bit | 64 bit

https://www.eclipse.org/downloads/

Eclipse IDE for C/C++ Developers

175 MB   555,045 DOWNLOADS

Windows
⬇ 32 bit | 64 bit

32 vs 64

Webclipse - New!
Adding REST Inspect, Hot Reload, JavaScript Debug and more to your Eclipse, for free.

⬇ INSTALL NOW

RELATED LINKS

- **Compare & Combine Packages**
- **New and Noteworthy**
- **Install Guide**
- **Documentation**
- **Updating Eclipse**
- **Forums**

MORE DOWNLOADS

- **Other builds**
- **Eclipse Mars (4.5)**
- **Eclipse Luna (4.4)**
- **Eclipse Kepler (4.3)**
- **Eclipse Juno (4.2)**
- **Older Versions**

Hint
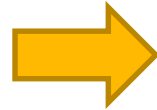
You will need a **Java runtime environment (JRE)** to use Eclipse (Java SE 7 or greater is recommended). All
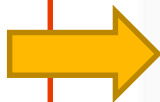
15.6" DISPLAY
16GB MEMORY
1.0TB HARD DRIVE

Computers

Do you understand all these terms?

This product is no longer available. Continue shopping at Costco.

Toshiba Satellite S55 Laptop • Intel Core i7 • Backlit Keyboard

To be continued

Purchase the computer and a FREE 1 Year Kaspersky Internet Security (1-User) download will be automatically added at checkout. The software download will be emailed to you. State law may require sales tax to be charged on the pre-discounted price if the product is subject to sales tax. Processor & Memory: Intel® Core™ i7-4700MQ Processor 2.4 GHz (up to 3.40 GHz with Intel® Turbo Boost Technology) 16GB DDR3 1600MHz (max 16GB) Drives: 1TB (5400 RPM) Serial ATA hard disk drive DVD-RW (Writes to DVD/CD) Operating System: Microsoft® Windows 8 (64-bit) Graphics & Video: 15.6" diagonal widescreen TruBrite® TFT display at 1366 x 768 native resolution (HD) Native support for 720p content 16:9 aspect ratio Mobile Intel® HD graphics with shared graphics memory Communications: HD Webcam and microphone 10/100/1000 Ethernet Wi-Fi® Wireless networking (802.11b/g/n) Audio: Built-in Harmon/Kardon® stereo speakers DTS Studio Sound™ Keyboard: Premium Backlit Keyboard with 10-key (black) Touch pad pointing device with multi-touch control One Touch function keys I/O Ports & Slots: 3 USB ports (2 USB 3.0 + 1 USB 2.0 port with USB Sleep and Charge) RJ-45 LAN port Memory Card Reader Microphone input port Headphone output port HDMI® RGB output port Slot for Security Lock Power Supply: 4cell/43Wh Lithium Ion battery pack 90W (19V 4.74A) 100-240V/50-60Hz AC Adapter Additional Information: Dimensions: 15.2" W x 9.9" D x 1.1" H Approximate Weight: 5.3 lbs. Model: S55-A5236 / PSKK2U-006005