SPRING 2017 EDITION

GD205

Game Programming II - Prof. Alec McClure

WEEK 15

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How does majoring in CompSci differ from GD?

AAS Game Design

- Very little formal and theoretical background
- Design and Solution driven
- Practical
- Very specific domain (games)
- Requires basic arithmetic and algebra
- Focus on making things work (often referred to as hacking)

BS Computer Science

- Primarily focused on structures, removed from results
- Foundations (networking, graphics, databases, etc.)
- Abstract and Theoretical (impractical for immediate use)
- Many other domains (e.g. operating systems, data manipulation
- Requires much higher level math (calc, stats, matrix algebra, etc.)
- Focus on best practices and big picture

AASGD

- Very little formal and theoretical background
- Design and Solution driven
- Practical
- Very specific domain (games)
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BSCS

- Primarily focused on structures, removed from results
- Foundations (networking, graphics, databases, etc.)
- Theoretical
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High Vs. Low Level Languages

Human languages	E.g., English, French, Spanish, Chinese, German, Arabic etc.
High level programming language	E.g., Python, Java, C++ for (i = 1; i <= 10; i++)
Low level programming language	Assembly MOV #10, R0
Machine language	Binary 10100000 1010 00
	Computer hardware

High level

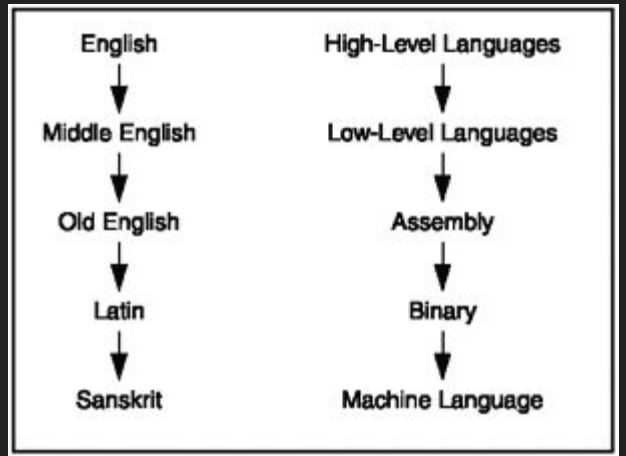
Low level

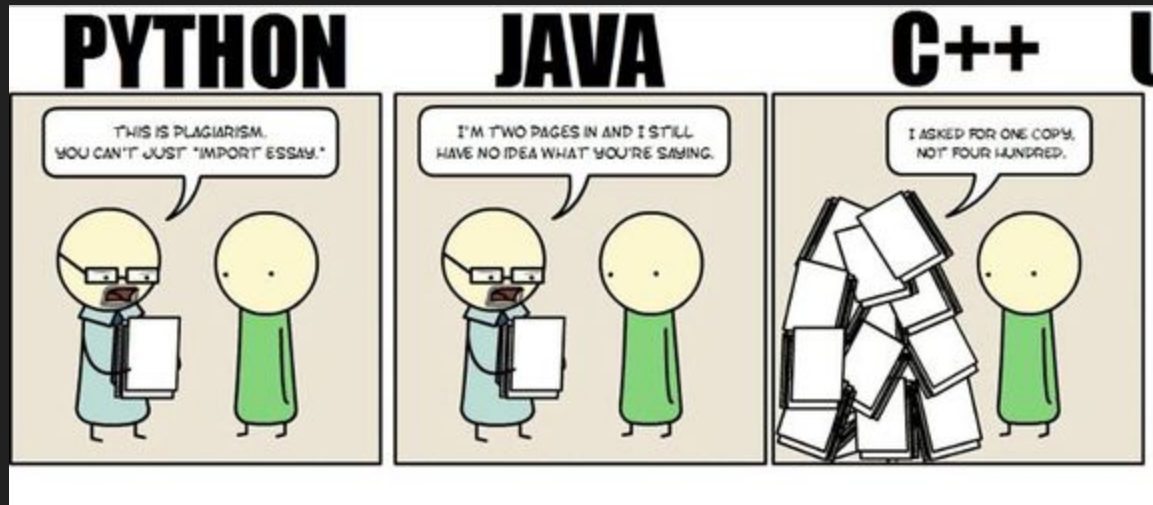
James Tam


WHAT ARE YOU STUDYING ?
C++
quickmeme.com

C++

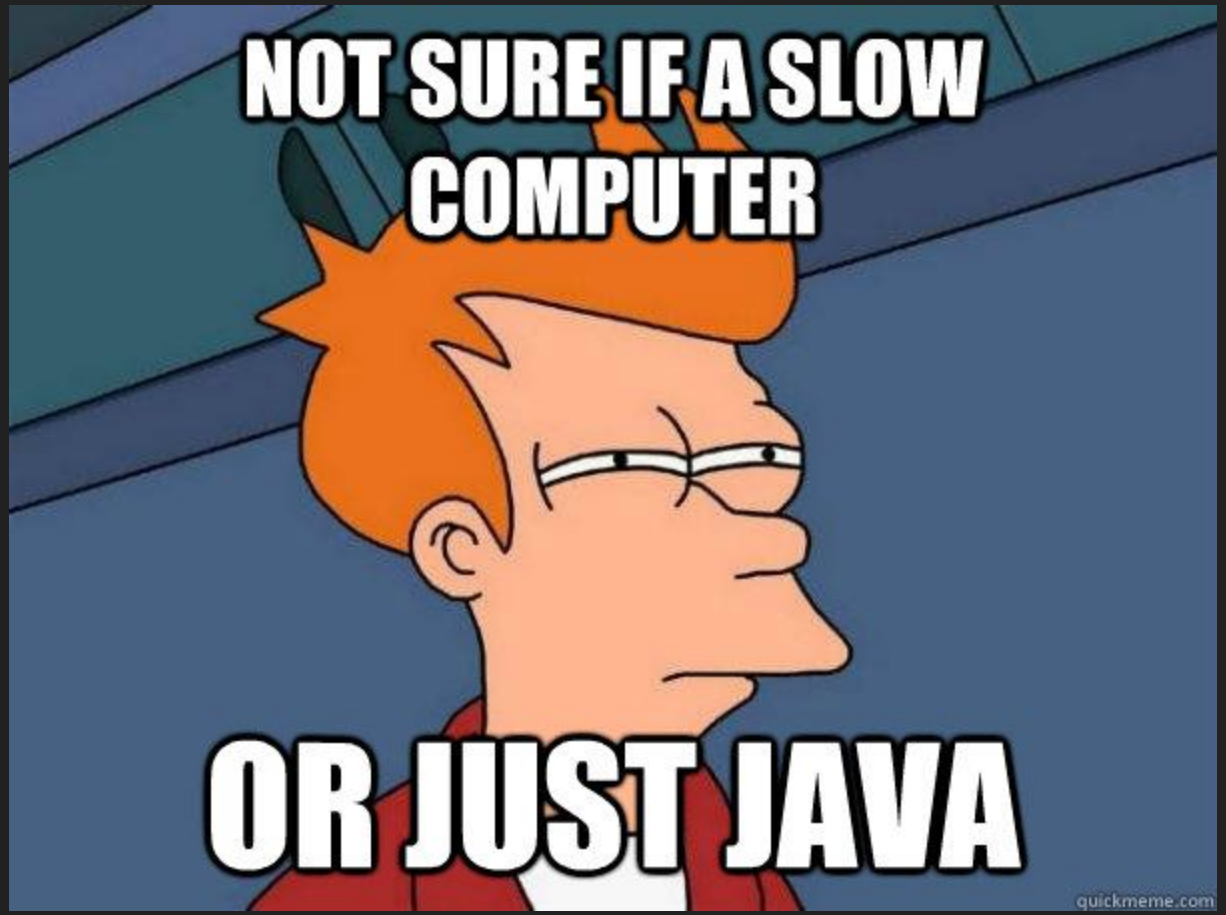
- High Level vs Low Level --- difference is degree of abstraction, high built upon the low
- you only live once vs yolo
- high level = lot of functionality for little code; allows us to formulate more complexity
- Garbage collection; Memory management





Java(e.g., Processing) vs C++ (1983)

- C++ (can be) FAST
- Java runs inside virtual machine, allowing it to be multiplatform
- Off the shelf vs. custom built
- “Abstraction penalty”


NOT SURE IF A SLOW COMPUTER
OR JUST JAVA
quickmeme.com

Scripting vs Programming

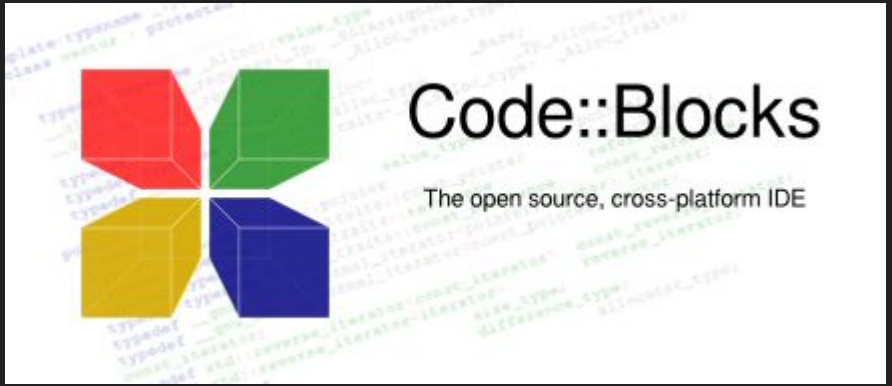
Interpreter	Compiler
Translates program one statement at a time.	Scans the entire program and translates it as a whole into machine code.
It takes less amount of time to analyze the source code but the overall execution time is slower.	It takes large amount of time to analyze the source code but the overall execution time is comparatively faster.
No intermediate object code is generated, hence are memory efficient.	Generates intermediate object code which further requires linking, hence requires more memory.
Continues translating the program until the first error is met, in which case it stops. Hence debugging is easy.	It generates the error message only after scanning the whole program. Hence debugging is comparatively hard.
Programming language like Python, Ruby use interpreters.	Programming language like C, C++ use compilers.

Getting started with C++ – IDEs

- XCode (OSX)
- Eclipse (OSX/Win/Linux)
- Code::Blocks (Win/Linux)

Alternative for hardcore masochists:

- Text editor, terminal and compiler



Getting started with C++ – Frameworks

You should start with a framework if you want...

- 3D Rendering
- 2D Rendering
- Sound
- or ANYTHING besides a terminal window with monochromatic ASCII characters inside

OpenFrameworks - http://openframeworks.cc/

Cinder - https://libcinder.org/

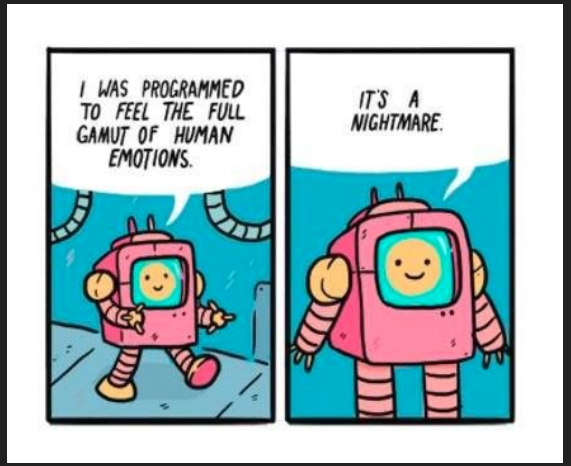
Small and Fast Multimedia Library (SFML) - https://www.sfml-dev.org/

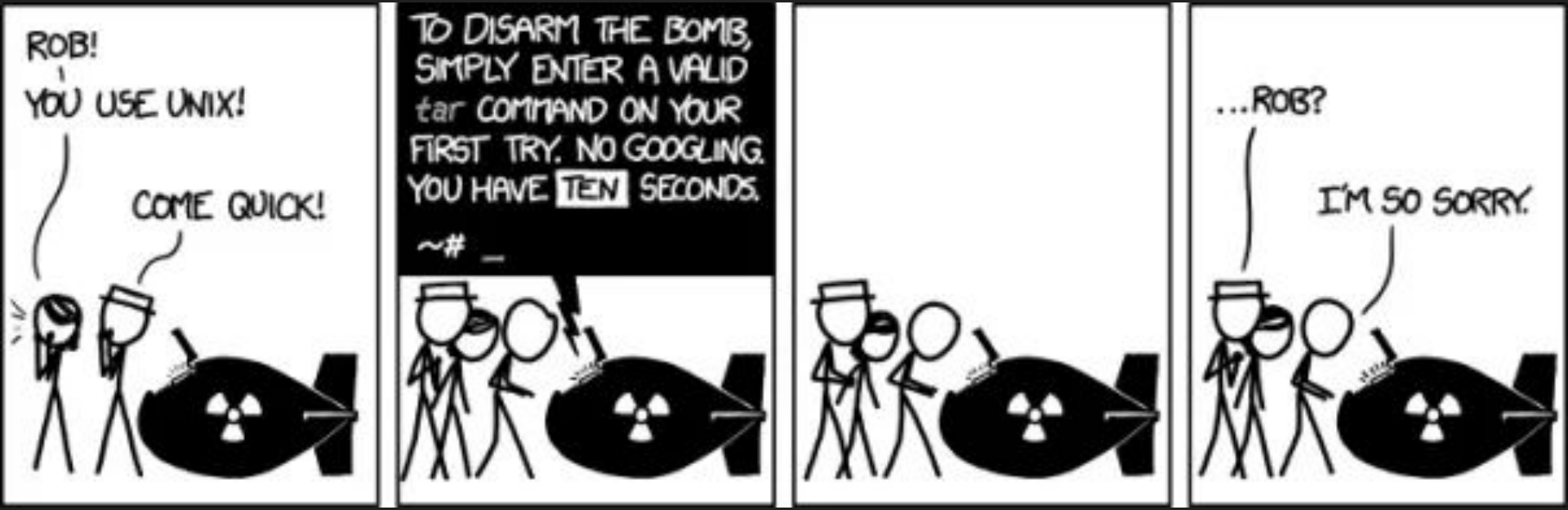
Looking forward...

How to Succeed with Code

How to Succeed with Code

- Be resourceful - Google and code documentation is your friend
- Don't sleep. Also, sleep! (Maker's Schedule)
- Get comfortable using terminal in Unix-like operating systems (Linux, OSX, etc.)
- Use version control systems like Git
- Become a machine




ROB!
YOU USE UNIX!
COME QUICK!
TO DISARM THE BOMB, SIMPLY ENTER A VALID tar COMMAND ON YOUR FIRST TRY. NO GOOGLING. YOU HAVE TEN SECONDS.
~# _
...ROB?
I'M SO SORRY.

NEVER HAVE I FELT SO CLOSE TO ANOTHER SOUL

AND YET SO HELPLESSLY ALONE

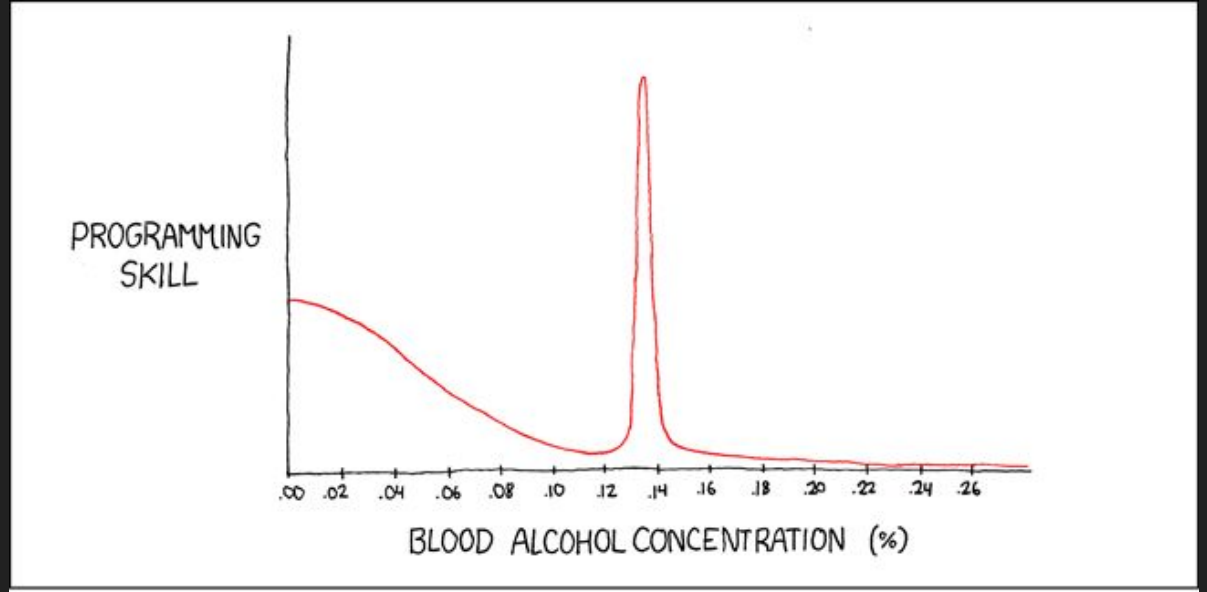
AS WHEN I GOOGLE AN ERROR

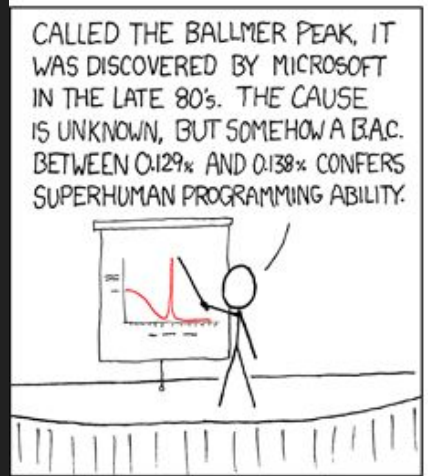
AND THERE'S ONE RESULT

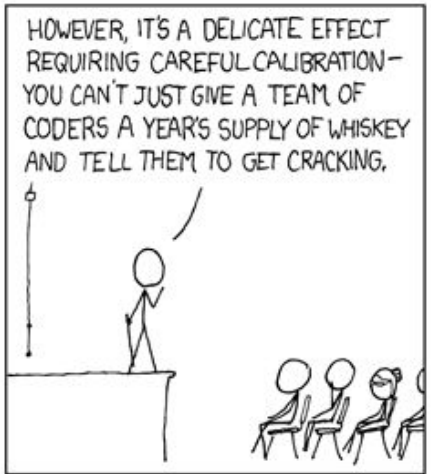
A THREAD BY SOMEONE WITH THE SAME PROBLEM

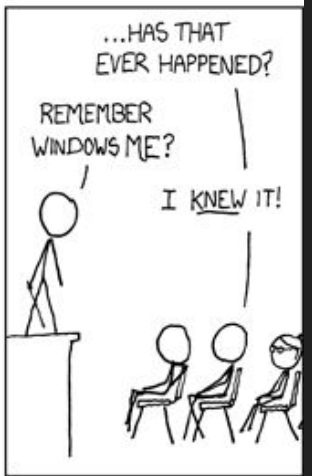
AND NO ANSWER

LAST POSTED TO IN 2003

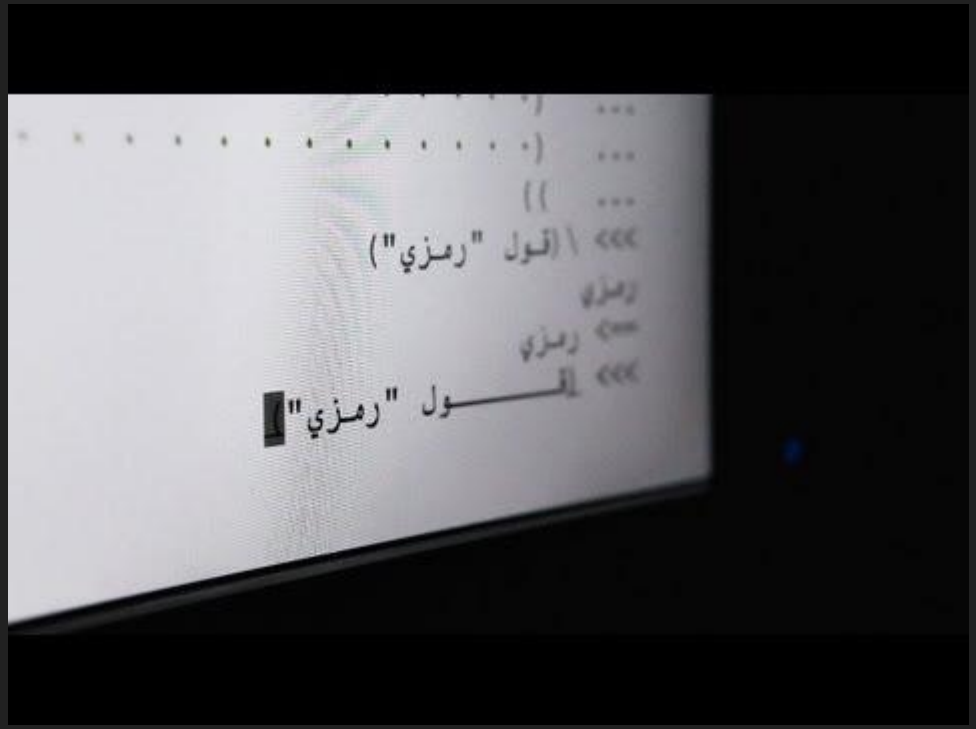

PROGRAMMING SKILL
.00 .02 .04 .06 .08 .10 .12 .14 .16 .18 .20 .22 .24 .26
BLOOD ALCOHOL CONCENTRATION (%)


CALLED THE BALLMER PEAK. IT WAS DISCOVERED BY MICROSOFT IN THE LATE 80's. THE CAUSE IS UNKNOWN, BUT SOMEHOW A B.A.C. BETWEEN 0.129% AND 0.138% CONFERS SUPERHUMAN PROGRAMMING ABILITY.


HOWEVER, IT'S A DELICATE EFFECT REQUIRING CAREFUL CALIBRATION— YOU CAN'T JUST GIVE A TEAM OF CODERS A YEAR'S SUPPLY OF WHISKEY AND TELL THEM TO GET CRACKING.


...HAS THAT EVER HAPPENED?
REMEMBER WINDOWS ME?
I KNEW IT!

English/Latin Script Bias



Unity Quick Tips

- Profiler/Optimization
- UI
- RenderTextures
- Fog
- Project Settings
- Terrain Tool