COMP2511

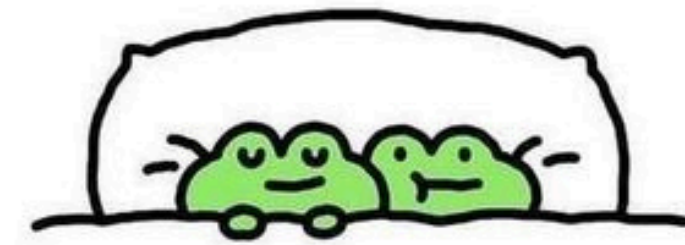## WEEK 1

Object orietned programming!!!

INTRODUCTION

- Jeremy
- 3rd year Computer Science / Science (Mathematics)
- Second time teaching COMP2511🙏
- Did COMP2511 in 23T3!
- Taking COMP4128, MATH2701, MATH3411
- Enjoys: Walks, Cooking and Competitive Programming

COMP2511!

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AGENDA

- Introduction

- Solving Design Problems

- Hello Java and Git Revision

- Abstraction

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ADMIN STUFF

Getting Help

1. Forum
2. Help Sessions
3. Ask your friends/group partner
4. Email me
   (jeremy.le1@unsw.edu.au)

Email the course if you would like anything escalated to course admins (cs2511@cse.unsw.edu.au)

Platforms

1. WebCMS3 (Course Info)
2. GitLab (Code)
3. EdStem Forum
4. Moodle / Echo360 (Lectures)

Assessment Structure

Assignment I : 15%
Assignment II: 20%
Assignment III: 8% Bonus
Coursework (Labs): 15%
Final Exam: 50%

Tutorials / Labs

1 hour tutorial, 2 hour lab
Tutorial: Content + Demonstration
Labs: Exercises, General Help
At least ~50% of the exam

Slides & Code: https://github.com/jeremyle56/tutoring/tree/24T3/24T3/cs2511

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UNSW has decided that they want to create their own light rail, which takes students from upper campus to lower campus. Design a solution for this – how will it work? What will need to be changed about the campus layout for it to work?

JAVA VS OTHER LANGUAGES

Scopes and Code Blocks
- Similar to C and JavaScript/TypeScript, **Java** uses the curly brace syntax { and }.

Classes and Object Oriented Program
- **Java**, Python, JavaScript/TypeScript support Object Oriented Programming (OOP)
  - This means they have classes and inheritance.
- All code in **Java** has to exist within a class.

Types:
- C, TypeScript and Java are statically typed.
- Python, JavaScript are dynamically typed.

JAVA VS OTHER LANGUAGES

Memory:
- C allows for manual memory via the standard library.
- **Java**, Python, JavaScript, TypeScript have automatic memory managment with a garbage collector.

Compilation:
- C compiles into machine code and seperate executable.
- **Java** and Python compiles into byte code which is interpreted.
- TypeScript transpiles into JavaScript code which is interpreted.

VSCODE EXTENSIONS

Ensure that you have the correct extensions installed

HELLO JAVA

Make a simple Java program that prints "Hello World" in the HelloWorld class.

```java
public class HelloWorld {

    Run | Debug
    public static void main(String[] args) {
        System.out.println(x:"Hello World");
    }

}
```

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GIT REVISION

- Version Control software
- Allows you to save snapshots of code
- Combined with cloud providers / online storage, i.e. Gitlab / Github / Bitbucket, allows users to work on code together

git add: Stage files

git commit: Commit the staged files as a snapshot

git push: Push your new commits to an online origin

git status: State of current repository & branch

git log: History of current branch

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SUM

Inside a new file called Sum.java, write a program that uses the Scanner class which reads in a line of numbers separated by spaces, and sums them.

SHOUTER

Inside a new file Shouter.java, Write a program that stores a message and has methods for getting the message, updating the message and printing it out in all caps. Write a main() method for testing this class.

ABSTRACTION

What is abstraction?

Abstraction is the process of generalising concrete details, such as attributes, away from the study of objects and systems to focus attention on details of greater importance.

What examples of abstraction have we seen in previous courses?

Abstract Data Types (ADTs)
- Linked Lists
- Trees
- Graphs
- Etc...

In C:
- List.h file which provides an "interface" for List.c which is the implementation using the interface.

How does abstraction allow us to write better software?

Reducing complexity of code, reducing the reliance of code and "connectedness" of the whole project. (Coupling)

This means changing one class (section of code) will only have little effect on other aspects of the codebase.

Discuss how OOP takes abstraction to another level from what we have seen previously.

Abstraction is used to hide unnecessary information and display only necessary information to the users interacting.

Everything in Java is an object!

All objects provide an abstraction from each other.

Lab Time!!!

YAYYYY

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