Introduction to Software Engineering
CITS1220
Lecture Outline

1. What is software?
2. What is software engineering?
3. CITS1220 organisation
4. Eclipse IDE demonstration
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Complexity

The Boeing-777 commercial aircraft is a mix of proven equipment, many new technologies and some new features. Altogether the digital aircraft contains over $5 \times 10^6$ lines of code.

Complexity

Java 1200 projects are approx

- 250 lines of code and require approx 25 person hours of effort
- so the B-777 code is the size of 20,000 Java 1200 projects taking 57 person years
What new tools and skills do SW engineers need to design, develop and manage systems in the order of 20,000 Java1200 projects?
Tools & Skills in SE1220

- OO programming skills
- Quality assurance
- Project management and SW teams
- Professional practice and tools
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1. What is software?
2. What is software engineering?
3. Unit organisation
4. Eclipse IDE practical demo
Software Engineering

- Is a *creative* process in which
- there are few *right/wrong* answers
- but nonetheless some software is (much) better than others.
- Many lessons have been learned
- There are some sensible general approaches
- Choices must be evaluated and justified.
Software Engineering Definition

- the systematic study of concepts, processes and tools for developing software
Computer Scientist asks: what problems can be solved using software?

Software Engineer asks: How do we build software that solves real world problems?
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3. Unit Organisation
4. Eclipse IDE practical demo
Learning Support

- Unit Coordinator
  - Dr Tim French
    - Consultation Times Tue 10-11, CSSE 2.14
- Labs: Wed@12pm, Thu@1pm, Thu@3pm
- Unit web page and help1220
- Also see Java1200 lectures and labs for background material
Individual Programming Project

- Supported by weekly 2 hour labs CSSE 2.03
- Wed@12pm, Thu@1pm, Thu@3pm
- Pre-class preparation and demos during lectures before the class
- Lab work contributes to the project
  - Regular code check-in via cssubmit during semester (professional practice)
  - Self assessment tools will be provided each week
- Weight 20% (includes lab check ins)
- Due week 13, Fri Oct 23 by 12 noon
Group Project with Lego

- Student selected groups of 5 people
- Runs from week 7 to 10
- Weight 10%
- Due week 10, Tuesday 11 Oct 5pm
- Group demos during labs in week 10
Mid Semester Test and Exam

- Unit overview and lecture notes define the syllabus and scope of the unit
- Short and long answer questions will test your understanding of key points
- Class test worth 10%
  - 5 short answer questions, 30 mins
  - Wednesday 21 September @ 11am

- November exam worth 60%
  - 10 short answer and 4 long answer
  - 2 hours and 10 minutes exam time
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4. Eclipse IDE DEMONSTRATION
What does an IDE provide?

- Integrated Development Environment
- Visual representation of program components
- Ability to browse existing components easily, so you can find ones to reuse
- Quick access to help, documentation to use existing libraries and tools vs writing your own
- Better feedback and error messages when there are errors in your program
- Plugins for testing (JUnit), documentation, UML etc.
- Communication between programmers in a team, who share a common view of the program
- Programs in CITS1220 are small, but Eclipse will make life much easier
- In large projects, the benefits are greater still
package lab1;

public class Calculator {
    private int result;

    public Calculator() {
        result = 0;
    }

    public int getResult() {
        return result;
    }

    public void add(int n) {
        result = result + n;
    }

    public void sub(int n) {
    }
}