




# Introduction to Software Engineering CITS1220



# Lecture Outline

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



**SOFTWARE is NOT  
like other  
engineered products**



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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.

Report AGARD-AR-343, Advisory Group for Aerospace R&D 1996




# 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



# Lecture Outline

1. What is software?
2. **What is software engineering?**
3. Unit organisation
4. Eclipse IDE practical demo



# Software Engineering

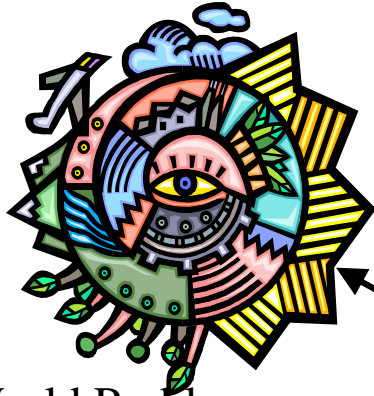
- Is a *creative process* in which
- there are few *right/wrong* answers
- but nonetheless some software is (much) better than others.
- Many lessons have been learned
- There are some sensible general approaches
- Choices must be evaluated and justified.



# Software Engineering Definition

- the systematic study of  
concepts,  
processes and  
tools  
for developing **software**

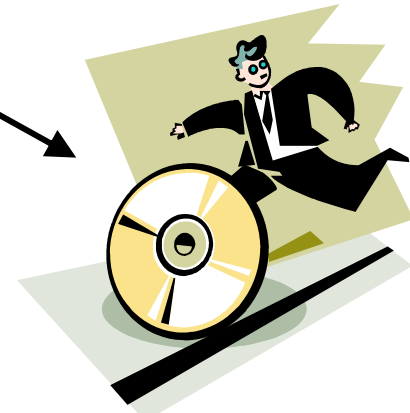
# Software Engineering & Computer Science



Real World Problems

Computer Scientist asks:  
**what problems can be solved using software ?**

Software Engineer asks:  
**How do we build** software that solves real world problems?



Software Solutions



# Lecture Outline

1. What is software?
2. What is software engineering?
3. **Unit Organisation**
4. Eclipse IDE practical demo



# Learning Support

- Unit Coordinator
  - Professor Rachel Cardell-Oliver
    - Consultation Times Tue 10-12
- Labs: Wed@3pm, 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@3pm, 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 csubmit 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, Fri 2 Oct 12 noon**
- 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 16 September @ 11am**
- November exam worth 60%
  - 10 short answer and 4 long answer
  - 2 hours and 10 minutes exam time



# Lecture Outline

1. What is software?
2. What is software engineering?
3. Unit organisation
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

