

# COMP 2011/2711

## Data Organisation

### 2006 Session 1

Lecturer: Norman Foo

Head Tutor: Loc Huynh; others  
to be nominated

# Prerequisites for 2011

- ◆ COMP1011 Computing 1A
  - Haskell
  - structured problem decomposition
  - abstract data types
- ◆ COMP1021 Computing 1B
  - procedural programming with C
  - control flow (if, for, while, switch)

# Resources

## ◆ Textbook

- **Data Structures and Algorithms in Java (4th Ed.) by Goodrich & Tamassia**

## ◆ [www.cse.unsw.edu.au/~cs2011](http://www.cse.unsw.edu.au/~cs2011)

- **lecture slides, announcements**
- **links to Java API**
- **assignments, tutorial exercises**

## ◆ Other Reference Books

- **Java Programming Language (3rd Ed.)**
- **Core Java 2**
- **Java in a Nutshell**

# Syllabus

- ◆ Java & Object-Oriented Programming
- ◆ Analysis of Algorithms
- ◆ Stacks, Queues, Trees
- ◆ Heaps, Hash Tables, Search Trees
- ◆ Sorting Algorithms
- ◆ Text Processing
- ◆ Graphs

# Assessment

- ◆ 3 Assignments (30%)

- ◆ Exam (70%)

- ◆ must be entirely **your own work**

- Can discuss ideas, but **DON'T** copy code
- **DON'T** let anyone see your code
- we use **plagiarism** detection programs, which work very well
  - ◆ first detection: negative mark for assignment
  - ◆ second detection: failure of course
  - ◆ third detection: possible expulsion from Uni

# What TO DO in general

- ◆ keep up with lectures and tutorials
  - read textbook and lecture slides
  - attempt tutorial questions **before** the tutorial
- ◆ read Java programming guides and tutorials
  - books or online
- ◆ practice Java programming
  - labs (tues 2-3, thurs 2-4)
  - use tutorial exercises for practice
  - assignments alone are **not** enough

# What TO DO this week

- ◆ buy the textbook, and read chapter 1
- ◆ register with sirius (in CSE labs)
- ◆ install Java 2 SDK on own PC (JDK1.4 or 1.3)
  - may need to set PATH and CLASSPATH
- ◆ Java 2 online tutorial
  - Your first cup of Java
  - Getting Started
  - Learning the Java Language
- ◆ Week 2 tutorial questions

# For Help

- ◆ Java installation at home
  - **JDK home computing CD from CompSoc, or online**
  - **CSE helpdesk**
  - **Java online docs**
- ◆ Java programming
  - **labs**
  - **consultations**
  - **your tutor**
  - **friends**
- ◆ Tutorials/Assignments
  - **Check FAQ on 2011 website**
  - **2011 consultants**
  - **email alias**
  - **then your tutor**
  - **then the lecturer**
- ◆ Admin problems
  - **email:**  
`cs2011@cse.unsw.edu.au`
  - **always use your CSE mail account, or include your student ID**
  - **last resort, contact the lecturer-in-charge**



# Example Program

- ◆ Copy.java (program for copying a file)

```
$ ls
```

```
Copy.java file1
```

```
$ javac Copy.java
```

```
$ java Copy file1 file2
```

```
$ ls
```

```
Copy.class Copy.java file1 file2
```

```
$ diff file1 file2
```

```
$
```

# copy.c

```
#include <stdio.h>
#define MAX_LINE 256
void copy( char *source, char *dest );
int main( int argc, char *argv )
{
    if( argc != 3 ) {
        printf(
            "Usage: copy <source> <dest>\n");
    }
    else {
        copy( argv[1], argv[2] );
    }
    return 0;
} ...
```

# Copy.java

```
import java.io.*;
public class Copy
{
    public static void main( String[] args )
    {
        if( args.length != 2 ) {
            System.out.println(
                "Usage: java Copy <source> <dest>" );
        }
        else {
            copy( args[0], args[1] );
        }
    }
    ...
}
```

# copy.c

```
void copy( char *source, char *dest ) {  
    FILE *fileIn;  
    FILE *fileOut;  
    char oneLine[MAXLINE];  
  
    fileIn = fopen( source, "r" );  
    if( fileIn == NULL ) {  
        printf( "Error: file not found\n" );  
        exit( 1 );  
    }  
    fileOut = fopen( source, "w" );  
    if( fileOut == NULL ) {  
        printf( "Error: file not found\n" );  
        exit( 1 );  
    }  
    while( fgets(oneLine,MAXLINE,fileIn )  
           != NULL ) {  
        fputs( oneLine, fileOut );  
    }  
    fclose( fileIn ); fclose( fileOut );  
}
```

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# Copy.java

```
public static void copy(String source, String dest) {  
    BufferedReader fileIn;  
    PrintWriter    fileOut;  
  
    try {  
        fileIn = new BufferedReader(  
            new FileReader( source ));  
        fileOut = new PrintWriter(  
            new FileWriter( dest ));  
  
        String oneLine;  
        while(oneLine = fileIn.readLine() != null ) {  
            fileOut.println( oneLine );  
        }  
        fileIn.close(); fileOut.close();  
    }  
    catch( IOException e ) {  
        System.out.println( "Error :" + e );  
        System.exit( 1 );  
    }  
}
```

2011 Overview

# Next Time

- ◆ Why Java?
- ◆ Object Oriented Design
- ◆ Classes, Types, Objects
- ◆ Methods
- ◆ Expressions
- ◆ Control Flow
- ◆ Arrays
- ◆ Input / Output
- ◆ Packages