COMP 2011
Data Organisation
2005 Session 1

Lecturer: Alan Blair
Head Tutor: Loc Huynh
Guest Lecturer: Prof. Norman Foo

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 (3rd Ed.) by Goodrich & Tamassia**
- **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 (40%)
- Exam (60%)
- to pass the course you must achieve
  - at least 20 out of 60 for the exam
  - at least 50 out of 100 overall

Plagiarism Policy

- Assignments must be entirely your own work
  - DON'T copy from others
  - 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
  - laboratory consultations (mon 12-1, thu 2-3)
  - 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 1.3 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 (Alan Blair)**

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 );
}
```

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 );
   }
}
```

Next Time

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