



# Principles of Computer Science II

Prof. Nadeem Abdul Hamid

CSC 121A - Spring 2005

Lecture Slides 7 - JAR Files  
and Introduction to Recursion



## JAR Files

- "Java Archive" files
  - Basically ZIP-format compressed files
- Allow bundling multiple files into single archive file
- Typically used to bundle up class files and resources (e.g. images) need for applets and applications

CSC 121A - Berry College - Spring 2005

2

## JAR File Operations

- (Command-line operation)
  - Create: `jar cvf jar-file input-file(s)`
  - View contents: `jar tvf jar-file`
  - Extract files: `jar xvf jar-file`
- To specify for use with applet

```
<applet code=AppletClassName.class
archive="JarFileName.jar"
width=width height=height>
</applet>
```
- <http://java.sun.com/docs/books/tutorial/jar/basics/index.html>

CSC 121A - Berry College - Spring 2005

3

## Recursion

- Powerful, general-purpose programming technique where a method (function) calls itself
- Recursive method: a method that calls itself, directly or indirectly
- Used to decompose a problem into smaller ones
- Good tool for developing elegant and efficient solutions to complex problems

CSC 121A - Berry College - Spring 2005

4

## Base Case and Recursive Step

- Base case: returns a value, without making any further recursive calls
- Recursive step/reduction step: break the problem into smaller pieces
  - Solve one or more of the smaller pieces by making a call back to the same method

CSC 121A - Berry College - Spring 2005

5

## Examples

- Factorial
- Fibonacci series (inefficient)
- Towers of Hanoi

CSC 121A - Berry College - Spring 2005

6