## AP(IT) – Composite Design Pattern Laboratory

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29th Feb 2016

## Aims

To get experience of designing and implementing a system using the composite design pattern.

## Background

You are building a computer operating system. Within your system you have files and directories. Directories can include other directories and/or files. All files and directories are within one top directory. The operating system needs to be able to do three things:

- Get the number of files inside any directory (including the number of files within sub-directories).

  Directories do not count as files.
- Get the total size of the files within a directory (the size of a directory is equal to the size of its contents)
- Display a directory and all of its contents as in the following example (the number in brackets is the total size for that directory). In this example, there are directories root, pictures, music, jazz and classical and various files. Directory contents should be indented.

```
root (886)
Settings (10)
pictures (120)
portrait (120)
music (756)
jazz (335)
Kind of Blue (201)
Giant Steps (134)
classical (421)
Beethoven, Symphony no 6 (421)
```

## **Tasks**

- Sketch out the three components you will need to build (an interface and two concrete classes)
- Create the three components. Remember to ensure that Directories should be able to include other directories.
- Create another class with a main that demonstrates the system.