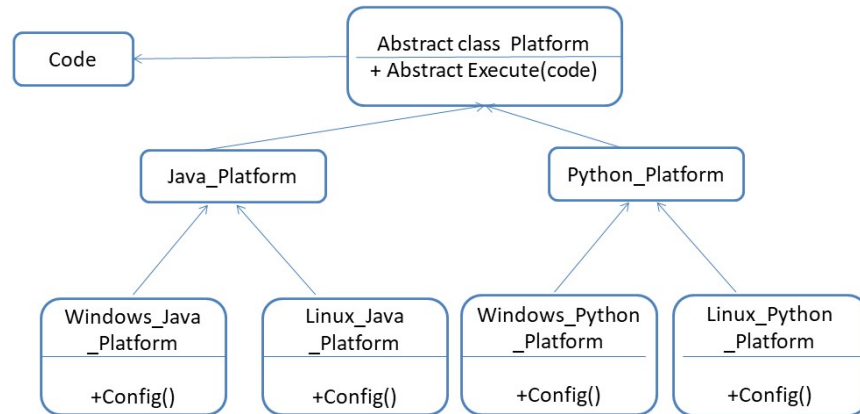


I3305

Graphical Interface and Application

Lab 5 : Designs Patterns

The AutoCode-programming site allows users to create and execute programs using their favorite programming language (Java, Python, C,...). It provides you with plenty of programming language options. You choose one, write a program with it (Source Code) and execute it to see the result. The first thing you need to decide is where the program will be run, i.e. on which kind of operating system. For example, a program written in Java language requires compilers to run on Windows or Linux based Systems. The overall hierarchy will be as the following:



Question 1: Now suppose we want to allow new Programming Language (as PHP), and new operating system (as Mac) to be added easily. Which design pattern you would use and how can we do that?

Question 2: Based on the new obtained hierarchy in **question 1**, suppose that we need to support the changes on the platform in way that the platforms can be configured to add a new function as command line tool, without much modification in source code. Which design pattern you would use and how can we do that?

Question 3: Now the site has started losing its users, the reason being the slowness of the site. The users are not interested in it any more. The site is very popular and sometimes there could be more than thousands of programmers using it. Because of that, the site is crawling. But the heavy usage is not the real problem behind the slowness of the site. Now suppose, there are around 2k users online and executing their code which results in 2k Code objects and 2k Platform objects. The Code object is a light weighted object and there should also be one Code object per user code. But, the Platform is a heavy object which is used to set the execution environment. Creating too many Platform objects is time consuming, and a heavy task.

Again based on the new obtained hierarchy in **question 2**, which design pattern you would use to control the creation of the Platform object? and how can we do that?