

**ALLAMA IQBAL OPEN UNIVERSITY, ISLAMABAD**  
(Department of Computer Science)

**WARNING**

1. **PLAGIARISM OR HIRING OF GHOST WRITER(S) FOR SOLVING THE ASSIGNMENT(S) WILL DEBAR THE STUDENT FROM AWARD OF DEGREE/CERTIFICATE, IF FOUND AT ANY STAGE.**
2. **SUBMITTING ASSIGNMENTS BORROWED OR STOLEN FROM OTHER(S) AS ONE'S OWN WILL BE PENALIZED AS DEFINED IN "AIOU PLAGIARISM POLICY".**

Course: Design Patterns (3481)  
Level: BS (CS)

Semester: Spring, 2014  
Total Marks: 100

**ASSIGNMENT No.1**

(Units: 1-4)

*Note: All questions are compulsory. Question 1 & 2 has 15 marks each and Question 3 & 4 has 35 marks each.*

- Q. 1 a) Define Model View Controller. Also explain the Model View Controller in detail with the help of two suitable examples.  
b) How to use a design pattern explain with the help of real life example? **(15)**
- Q. 2 a) Describes granularity, composition and delegation with the help of two suitable examples.  
b) What is the difference between Coupling and Cohesion explains in detail with the help of suitable examples? **(15)**
- Q. 3 Write a case study of Job Application design that consists of processing job applications applied to various positions by using Abstract Factory Method. **(35)**
- Q. 4 You are responsible for the Design of Online CV (Curriculum Vitae) Builder Application. The CV Builder Application will enable users to create his CV with cover letter. CV can be read, Download, Update, Delete and the like and shared with others. And also give option to user to arrange his CV according to his on requirement. Using these distributions as a starting point, and design online CV Builder Application by using a Façade Pattern or Builder Pattern. State your answer with the help of simple case study. **(35)**

## ASSIGNMENT No. 2

(Units: 5–8)

*Note: All questions are compulsory. Question 1 has 20 marks, Question 2 & 3 has 15 marks each and Question 4 & 5 has 25 marks each.*

- Q. 1 a) What are the applications of Flyweight Pattern? Explain the structure & participants of Flyweight pattern with suitable example.  
b) Explain Proxy pattern with the help of class hierarchy. (20)
- Q. 2 a) Explain the collaborations and consequences of Iterator pattern.  
b) Explain the collaborations and consequences of Chain of Responsibility pattern. (15)
- Q. 3 a) What are the implementation considerations of Momento Pattern?  
b) Discuss the Observer Pattern in detail with help of suitable example. (15)
- Q. 4 Write a simple Case study by using Template Pattern for the following problem. Suppose you have to read data from two data sources, e.g., CSV and database, then you have to process that data and generate the output as CSV files. (25)
- Q. 5 Design and Implement a TV Remote application by using State pattern. Suppose a TV Remote with two simple buttons to perform action, by pressing first button if the State is ON, it will turn on the TV and if state is OFF, it will turn off the TV and second button control mute function of volume. State your answer with the help of simple case study. (25)
- 

**Design Patterns (3481)**

**Credit Hours: 3 (3+0)**

*Recommended Book:*

*Design Patterns Elements of Reusable Object-Oriented Software by Erich Gamma, Richard Helm, Ralph Johnson and John Vissides*

**Course Outlines:**

**Unit–1: Introduction**

Introduction, Describing Design Patterns, The Catalog of Design Patterns, Organizing the Catalog, How Design Patterns Solve Design Problems, Selecting a Design Pattern, Use of Design Pattern

**Unit–2: Creational Patterns–I**

Abstract Factory, Builder, Factory Method

- Unit-3: Creational Patterns-II**  
Prototype, singleton, Discussion of Creational Patterns
- Unit-4: Structural Pattern-I**  
Adapter, Bridge, Composite, Decorator, Façade
- Unit-5: Structural Pattern-II**  
Flyweight, Proxy, Discussion of Structural Patterns
- Unit-6: Behavioral Patterns-I**  
Chain of Responsibility, Command, Interpreter, Iterator, Mediator, Memento, Observer, State, Strategy
- Unit-7: Behavioral Patterns-II**  
Template Method, Visitor, Discussion of Behavioral Patterns  
What to Expect from Design Patterns, A Brief History, The Pattern Community, An Invitation, A Parting Thought
- Unit-8: A Case Study: Designing a Document Editor-I**  
Design Problems, Document Structure, Formatting, Embellishing the User Interface, Supporting Multiple Look-and-Feel Standards
- Unit-9: A Case Study: Designing a Document Editor-II**  
Supporting Multiple Window Systems, User Operations, Spelling Checking, Hyphenation, Summary

=====