National University of Computer and Emerging Sciences

Software Re-Engineering (SE4001)

Sessional-I Exam

Date: February 27, 2024

Course Instructor(s)

Dr. Farooq Ahmed

Total Time: 1 hour
Total Marks: 25
Total Questions: 3

Semester: SP-2024
Campus: Lahore
Dept: Software Engineering

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Student Name	Roll No	Section	Student Signature

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CLO 1: Describe software re-engineering principles

Question 1 **[5 marks]**

Design Patterns can be very helpful in a successful Software Re-Engineering effort. Which problems can be resolved using a Strategy pattern? Explain with example(s).

CLO 2: Explain the activities involved in software re-engineering

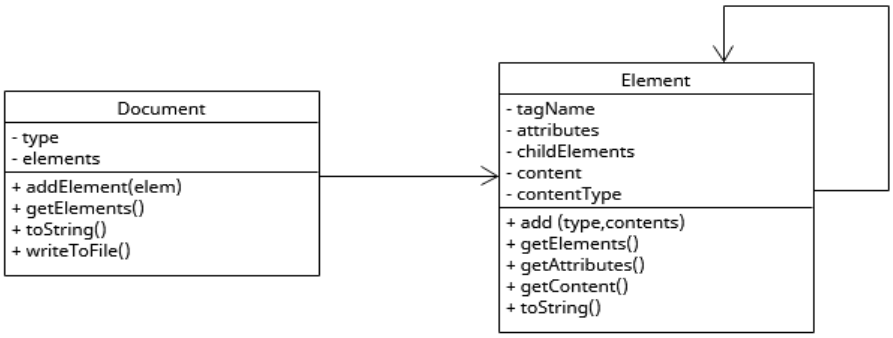
Question 2 **[5 marks]**

Reverse Engineering is a key activity in the re-engineering exercises. Explain the difference between top-down and bottom-up techniques for reverse engineering purpose.

CLO 4: Compute metrics to analyze design documents

Question 3 **[10+5 marks]**

Consider the following class diagram for representation of simple HTML and XML documents.



Document comprises of elements (defined by a start and matching end tag that are represented as angular brackets). Each element can contain: attributes (name-value pairs mentioned in the start tag) or body (content enclosed in the start and end tags). Body can be text, comment or further elements.

Given that each method of **Element** class accesses the following attributes:
add : { attributes, content, contentType, childElements }
getElements : { childElements }
getAttributes : { attributes }
getContent : { content }
toString : { tagName, attributes, childElements, content }

(a) Compute the following metrics for **Element** class and show complete working:

LCOM (CK)

LCOM (HS)

CBO

(b) Identify the defects in the given design and state your reasons.