International Institute of Information Technology, Hyderabad
(Deemed to be University)

CS6.201: Introduction to Software Systems; Spring 2024
IIIT Hyderabad   Final Examination

Max. Time: 1.5 Hrs   **Max. Marks: 90**

Q1. [15 marks] **HTML/CSS/JS.**

    a) Write a CSS file that creates a specific header, footer, body, font, and menu styles for your website.

    b) Use the above CSS page to create a webpage that can take a user's name, address, email, mobile number, and date-of-birth. Describe how would you validate these fields (no need to give code).

Q2. [15 marks] **Python, Problem Solving.**

    a) Write a python function that takes as input, an integer and returns the reversed integer. For example, if the input integer is 23124, the return value should be 42132.

    b) Write a python script that takes an integer input from the user and decides (and prints) if the number and its reverse are relatively prime or not.

Q3. [15 marks] **Files and Text Processing.**

    a) Write a python program that reads in a text file and find the top three most frequent words in it.

    b) What is the time complexity of your solution? State your assumptions. How can the performance be improved?

Q4. [15 marks] **Modules, Object Oriented Programming.**

    a) Write a Python Class that can store a matrix using numpy arrays as basis? Implement a function for matrix multiplication inside the class.

    b) Create a module called matrix that can also contains a function (outside the class) to determine if two matrices are compatible for multiplication.

Q5. [15 marks] **Python Internals.**

    a) State three differences between mutable and immutable data types in python? Give examples of both types.

    b) How are dictionaries implemented in Python? Suggest an alternative along with a list of strengths and weaknesses of your approach.

Q6. [15 marks] **SQL:** Given a table of movies with Titles, Year of release, Genre, Director, DoP, Main actors, IMDB score and total profit; Write SQL queries for the following.

    a) Get all movies (Title, Year of release, and Genre) that were released between 1950 and 1990, directed by "Woody Allen" or "Satyajit Ray" that made a profit (not loss).

    b) Find the total profit made by all movies in which "Amir Khan" acted.

    c) Write a Python code that can query the table and find the longest named movie in the database.