

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

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

**Max. Marks: 90**

**Max. Time: 1.5 Hrs**

**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.