CS6.201 - INTRODUCTION TO SOFTWARE SYSTEMS
Assignment 2 – Python, SQL, NoSQL
Due Date: 10/3/2025 8:00 PM (Friday)
Total Marks: 50 - Duration: 2 Weeks

NOTE: This assignment is an individual submission, not a group activity. Evaluation will be conducted based on a fixed grading rubric (syntax, logic, input and output) and the marks are divided as per prescribed weightage in respective question. Inputs/output should fit the criteria mentioned in respective questions. Unless it is specified, all input/output criteria are open to interpretation. All questions in the assignment are self-explanatory. Do not reach us for any clarifications. If you are answering a question based on a certain assumption, please feel free to mention it as you code comment(s). Submissions are to be made on both Moodle and github classroom here - https://classroom.github.com/a/OwKeuzAt

Q1: Using Python Lamda functions – answer the question by considering your roll number as input.

a. Identify prime number digits from your roll number and print them as output **(2 Marks)**
b. Identify odd number digits from your roll number and print them as output **(2 Marks)**
c. Identify even number digits from your roll number and print them as output **(2 Marks)**
d. Identify "zeros" from your roll number and print the count as output **(2 Marks)**
e. Identify digits from your roll number that are divisible by 2,3,4 and print the counts as output **(2 Marks)**

Q2: Using Python Dictionaries, perform following tasks using the JSON dataset. **Dataset**: https://github.com/sharmadhiraj/free-json-datasets/tree/master/datasets Pick all the files as input as your dataset.

a. Load the nested JSON into a Dictionary **(2 Marks)**
b. Print all the keys (parent, child, nested) together as a list on terminal **(3 Marks)**
c. Print all keys (parent, child, nested) along with their values into a CSV file **(5 Marks)**

Q3: Perform the tasks below using SQL using the provided dataset. Include all the scripts associated with the tasks below as part of your submission. **Dataset**: https://www.data.gov.in/catalog/hottest-and-coldest-places-punjab. Load both Datasets for this study.

a. Create a database and table(s) **(5 Marks)**
b. Import that data into created table(s) **(5 Marks)**
c. Provide 5 insights out of this dataset using the available data and submit their SQL queries. **(10 Marks)**

Q4: Perform the tasks below using NoSQL using the provided dataset. Include all the scripts associated with the tasks below as part of your submission. **Dataset**: https://www.mongodb.com/docs/atlas/sample-data/sample-analytics/ Please write a local mongod script or just include all queries in one file.

a. Write a NoSQL query to insert one record accounts collection **(2 Marks)**
b. Write a NoSQL query to insert five records using a single query into customer collection **(2 Marks)**
c. Write a NoSQL query for multi-value search in transactions collection **(2 Marks)**
d. Write a NoSQL query to count the rows in accounts, transactions and customer collections **(2 Marks)**
e. Write a NoSQL query to update a document in the transactions collection **(2 Marks)**

Submission Instructions:

1. Submit your submissions by accepting the Github classroom invite and also in moodle.
2. Follow the submission file structure as mentioned below and ZIP these folders into single file as <rollnumber>.ZIP.

```
├── Q1
│   ├── p1.py
│   ├── p2.py
│   ├── p3.py
│   ├── p4.py
│   ├── p5.py
│   └── README.md
├── Q2
│   ├── output.csv
│   ├── q2.py
│   └── README.md
├── Q3
│   ├── insights.txt
│   ├── q3.sql
│   └── README.md
├── Q4
│   ├── q4.js
│   └── README.md
└── README.md
```

3. Please do not forget to include a README.TXT file to mention your assumptions, execution instructions or anything else in the ZIP. If you are using any LLM for this task, please declare your usage with all required details here - https://forms.office.com/r/Mg97epP413 If you are found not mentioning about your LLM usage despite using one, you will be awarded '0'.
4. You will be awarded '0' if your submission is found to be plagiarized with other submissions.

Instructions from TA end:

1. Make sure you make commits to the git repository
2. Do not upload zip files to github
3. Follow the directory structure (any code written outside the given files won't be evaluated)
4. Do not create a Readme.txt, write your assumptions in the given Readme.md
5. Only the final commit will be evaluated

Happy -_- Programming!