

**CC-215 Database System  
Spring 2025  
Assignment - 01**

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**Issue Date:** Friday – February 14<sup>th</sup>, 2025  
**Submission Deadline:** Friday – February 21<sup>st</sup>, 2025 (In the Lab)

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**Instructions!**

1. For this assignment, typed, printed or softcopy solutions will not be accepted. Only hand-written submissions to this assignment will be accepted.
2. The content covered through this assignment is part of syllabus so make sure to consult reliable sources ONLY. Reference reliable sources such as text books and/or reference books, reputable web sources and lecture notes/handouts from renowned professors or universities.
3. Remember AI-generated content (i.e. responses from ChatGPT, Bard, Meta, etc.) is not a considered a reliable source and must not be used.
4. Provide proper citations for all sources consulted, formatted professionally. References should be listed at the end of the assignment. A proportion of the grade for this assignment is associated with proper referencing means that a specific percentage of the total marks for the assignment will be awarded based on how well you cite and reference the consulted sources.
5. Use clear and readable handwriting. Submit neatly written pages (avoid torn, smudged, or crumpled pages).
6. Hard **DEADLINE** of this assignment is **Friday, February 21<sup>st</sup>, 2025**. Late submissions will incur penalties so manage emergencies beforehand. One way to manage emergencies is to attempt and submit the due artifact well before time.

**Question 1**

**[80 Marks]**

1. Explain the concept of database schema and discuss the three types of schemas in a database.
2. Explain OLAP (Online Analytical Processing) and OLTP (Online Transaction Processing). Provide examples and real-world use cases for each. Additionally, compare and contrast their characteristics, functionalities, and applications.
3. What does the term *data independence* mean, and why is it an important goal?
4. Following is a list of roles in a professional database career. Discuss each role with its responsibilities and skillset required for the role.
  - 4.1 Database Developer
  - 4.2 Database Designer
  - 4.3 Database Administrator
  - 4.4 Database Analyst
  - 4.5 Database Architect
  - 4.6 Database Consultant
  - 4.7 Database Security Officer
  - 4.8 Cloud Computing Data Architect
5. Describe the types of facilities that you would expect to be provided in a multi-user DBMS.
6. Of the facilities described in your answer to Question 6, which ones do you think would *not* be needed in a standalone desktop DBMS? provide justification for your answer.
7. What are some basic database functions that a spreadsheet cannot perform?
8. What is data dictionary in database? Why is it very important?
9. What is data redundancy, and which characteristics of the file system can lead to it?
10. What is structural independence, and why is it important?

## Question 2

[20 Marks]

Consider the following file structure and answer all the question in this part:

PROJECT_CODE	PROJECT_MANAGER	MANAGER_PHONE	MANAGER_ADDRESS	PROJECT_BID_PRICE
21-5Z	Holly B. Parker	904-338-3416	3334 Lee Rd., Gainesville, FL 37123	16833460.00
25-2D	Jane D. Grant	615-898-9909	218 Clark Blvd., Nashville, TN 36362	12500000.00
25-5A	George F. Dorts	615-227-1245	124 River Dr., Franklin, TN 29185	32512420.00
25-9T	Holly B. Parker	904-338-3416	3334 Lee Rd., Gainesville, FL 37123	21563234.00
27-4Q	George F. Dorts	615-227-1245	124 River Dr., Franklin, TN 29185	10314545.00
29-2D	Holly B. Parker	904-338-3416	3334 Lee Rd., Gainesville, FL 37123	25559999.00
31-7P	William K. Moor	904-445-2719	216 Morton Rd., Stetson, FL 30155	56850000.00

1. How many records does the file contain? How many fields are there per record?
2. What problem would you encounter if you wanted to produce a listing by city? How would you solve this problem by altering the file structure?
3. If you wanted to produce a listing of the file contents by last name, area code, city, state, or zip code, how would you alter the file structure?
4. What data redundancies do you detect? How could those redundancies lead to anomalies?

### Grading policy:

1. The grading criteria for this assignment will be as follows:
  - Content Accuracy & Depth (60%) – Correct, well-explained answers.
  - Presentation & Clarity (20%) – Neat handwriting, structured responses.
  - Proper Referencing and citation (20%) – Citing reliable sources professionally: use any standard citation style i.e. IEEE, MLA, APA, Chicago etc.
2. Late submission policy:
  - 10% deduction per day after the deadline.
  - No submissions accepted and zero marks for submissions after Tuesday – February 25, 2025.
  - -10 marks for submission after Tuesday – February 25, 2025.

**Good Luck!**

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“As I have said, the first thing is to be honest with yourself. You can never have an impact on society if you have not changed yourself. Great peacemakers are all people of integrity, of honesty, but humility.”

~Nelson Mandela