Colegio de Colegio de San Juan de Letran

Intramuros, Manila

College of Engineering and Information Technology
Information Technology Department

FINAL EXAMINATION
IIT404 – DATA STRUCTURE AND ALGORITHM
1st Semester, AY 2024-2025
Asst. Prof. Maria Luisa M. Carlos

GENERAL DIRECTIONS: Read and follow the instructions very carefully. Answer the following questions to the best of your knowledge. Any form of cheating is strictly prohibited, those who are caught with identical work will get a grade of zero (for all). Submit your exam in our Google Classroom Assignment entitled "Final Exam".

LEARNING OBJECTIVES:

LO3: Analyze complexity of algorithms
LO4: Solve problems computationally through the application of data structures and algorithms

I. PRACTICAL EXAM (100 Points)

Directions: Create the program based on the given scenario and provide both screenshot output (per module) with the source code (.txt and .cpp). Grades will be accumulated using the rubric provided at the end of this document.

Problem: You've been hired as a programmer of a small startup bank. The bank manager wants to create a console-based program that will cater the functions of the bank to its clients. After the discussion, you have the following requirements:

1. Provide a menu to the user with the following options:
    a. Verification of client (using PIN)
    b. Registration
    c. Login
    d. Deposit
    e. Withdraw
    f. Balance Inquiry
    g. Change PIN

2. Use a structure and/or nested structure to store the record of a client. Attributes of a structure may include:
    a. PIN
    b. Name
    c. Balance

3. Use a linked list to store multiple structures
4. Provide an admin console where an admin can enter a unique PIN and has the following menu:
    a. View
    b. Delete (account)
    c. Search (by PIN or name)

Program Flow:

1. Main menu will provide two options: login and register
2. For new client, proceed to registration before login
3. For existing client, they may proceed to login and enter their unique PIN
4. Upon successful login, provide the banking options to client (withdraw, deposit, balance inquiry, change pin)
5. Validation of input must exist to all possible areas in your program including but not limited to:
    a. If the user PIN is existing or not
    b. No customer can register a PIN if the given PIN already exists
    c. No customer can withdraw if the amount to be withdrawn is greater than the balance.

Rubrics:

Program (50 pts)	**Excellent (9-10)**	**Good (6-8)**	**Fair (3-5)**	**Poor (0-2)**
Program execution	Program executes correctly with no syntax or runtime errors	Program executes with some very minimal errors	Program executes with a few errors	Program does not execute
Correct output	Program displays correct output with no errors	Output has minor errors	Output has multiple errors	Output is incorrect
Design of output	Program displays more than expected	Program displays minimally expected output	Program does not display the required output	Output is poorly designed
Design of logic	Program is logically well designed	Program has slight logic errors that do no significantly affect the results	Program has significant logic errors	Program is incorrect
Standards	Program is stylistically well designed	Few inappropriate design choices (i.e. poor variable names, improper indentation)	Several inappropriate design choices (i.e. poor variable names, improper indentation)	Program is poorly written

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