Brush-up training

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Contents

History

Version	Author	Date	Comments
1.0	Kavan & HK	11-Dec-2012	First version

Objective

- Brush up the fundamentals of C Programming:
    - C language syntax, keywords, loops, conditional statements, control flow
    - Types (Its size, range etc), Operators(Precedence) and Expressions(Evaluation patterns)
    - Various usage of functions
    - Arrays, Structures, Unions
    - Input and Output operations
    - Pointers, function pointers (Pointer fundamentals needs to be excellent)
- Learn library fundamentals
    - Compilation stages
    - Static and dynamic libraries
    - Library usage in application
    - Use of 'make' file
- At the end of training, trainee should be able to independently code in C language, create static and dynamic libraries

Total Duration:

- 26 working days

Total Points:

- Points can be earned from exercise set#1 to 5: 160
- Bonus points can be earned: 40
- Minimum point to be earn: 110

Instructions:

- Use Linux OS(Ubuntu 10.04 LTS) for development of all exercises
- Use vim, emacs or similar type of editor
- Use GCC compiler for code compilation with "-Wall" option & "-o" option
- Every exercise must be developed in separate file
- Every exercise should have problem-statement written at the starting of the file
- Every code compilation should not have any error or warning
- Code must be written with good comments and indentation

Evaluation criteria

- All exercises need to be completed within defined duration. If exercises are completed then only evaluation can be done.
- Every exercise in set 1 to 3 should produce result as specified in problem statement
- Trainee must be able to explain each exercise.
- This exercise provides opportunity of scoring maximum 200 points on successful completion of training. Trainee has to earn minimum 110 points. If trainee doesn't get minimum 110 points then he/she is not qualify for next training.
- If it is found that the code/design is copied from somewhere, then 50 points will be deducted.
- If trainee completes training before time, then there will be bonus of 10 points.

List of Exercises

Point earning criteria for exercise set 1 to 3

- Reviewer will choose 5 exercises randomly from each set (1 to 3).
  - 2 point on successful completion of exercise (as per evaluation criteria)
  - 3 point for the explanation and answer of the questions asked by reviewer.
- If trainee completes all exercise of chapter 8, then he/she can earn 10 bonus points.

Exercise Set#1

- Read chapter 1, 2 and 3 from book "The C programming Language K &R"
- Develop code for every exercise mentioned in chapter 1, 2 and 3
- Duration: 5 days
- Points earn: 25

Exercise Set#2

- Read chapter 4 and 5 from book "The C programming Language K &R"
- Develop code for every exercise mentioned in chapter 4 and 5
- Duration: 5 days
- Points earn: 25

Exercise Set#3

- Read chapter 6 and 7 from book "The C programming Language K &R"
- Develop code for every exercise mentioned in chapter 6 and 7
- Duration: 5 days
- Points earn: 25

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Exercise Set#4
- Read "library fundamental" from provided materials.
- Implement exercise provided in material.
- Points earned: 10
- Duration: 1 day

Exercise Set#5
- Total Duration: 10 days
- Total Points earn: 75
- For compiling library and application use Make
- Develop a dynamic library in "C" to provide following functionalities of Singly Linked List
    - Addition of nodes: At first, At last, At intermediate
    - Deletion of nodes: At first, At last, At intermediate
    - Traversing of nodes
    - Replacing of nodes: At first, At last, At intermediate
    - Printing of nodes: All, Reverse, Up-till given node
    - Searching of nodes
    - NOTE: Library should work with any type of data structure
    - Point can be earned: 30
- Develop "tele book" application in C by using Linked list library developed earlier. Application should provide following feature.
    - A run-time database of Telephone connection. (Database needs not to be persistent)
    - This database should contain following fields: Name, Unique ID, Password, Address line 1, Address line 2, Area, City, State, Pin-Code, Telephone no:1, Telephone no:2, Telephone no:3.
    - Application should be able to add, modify, query and delete subscribers.
    - For every record, except "Telephone no 2" and "Telephone no 3" each field are mandatory.
    - On successful creation, Unique Subscriber ID should be generated. For any subsequent operations user has to provide id and password.
    - Point can be earned: 30
- Deliverables
    - Requirement document of library + application: 1 day [5 + 5 points]
    - Design document of library + application: 2 day [10 + 10 points]
    - Implementation of library: 3 day [15 points]
    - Implementation of application: 3 day [15 points]
    - Testcase document: 0.5 day [10 points]
    - Testing of application: 0.5 day [5 points]
    (NOTE: Code development will be start after submission of requirement and design document)
- Additional 10 points will be awarded, if library and application provides run-time mechanism of enabling/disabling of logs and debug message
- Addition 10 points will be awarded, if there isn't any memory leaks in your library and application (Hint: You can use valgrind tools to check your memory leaks)