Data Structures and Algorithms Lab
02. Strengthening the Basics

Lab Code: 17ECSP201   **Lab No:** 02   **Semester:** III

Date: 07 Aug, 2018   **Batch:** D1-D2

Theme: Code. Be a Code. Do a Code.

Objective: Goofing around the learnt basics

Below listed are tasks which you will carry out in a team of two. I know the codes are handful but that's why you have got two hands!

Task 01:

Below listed are few statements about Pointers. You need to prove them by demonstrating through a C program. Pick any 05 out of given 07. The blue colored ones are compulsory.

- Pointer is a variable which holds the address of another variable
- **A globally declared pointer is automatically initialized to NULL by compiler where as locally declared is not**
- A pointer variable cannot be divided by a constant or a variable
- Two pointers cannot be multiplied or divided
- **When we increment a pointer it gets incremented by pointer data-type number of bytes**
- Modifying the address of constant pointer is not allowed
- Typecast a void pointer to integer pointer   **[Marks: 50]**

Task 02:

Pointer 01: Hey, hello… Have I seen you somewhere? You look very familiar to me.

Pointer 02: eww! aaan??

Pointer 01: Why are you holding all the waste in your hand? Why don't you throw them?

Pointer 02: Who is this talking?? Why don't you have any shape?

Pointer 01: Me and my fate! And that's how my existence is! I can take any shape.

(Both are disturbed and confused. Just like the way you are now.)

Pointer 01: You look funny!

Pointer 02: You too. Very funny!

Pointer 01: Who cares? Let's party. Hop in.

Pointer 02: Dude!

Which of the following statement would be true with respect to above conversation??
    A. Pointer 01 is NULL Pointer and Pointer 02 is not actually a pointer
    B. Pointer 01 is a void pointer and Pointer 02 is a NULL pointer
    C. Pointer 01 and Pointer 02 are both NULL Pointers
    D. Pointer 01 is void pointer and Pointer 02 is dangling pointer
    E. Pointer 01 is dangling pointer and Pointer 02 is a NULL pointer
    F. Pointer 01 is void pointer and Pointer 02 is NULL pointer
    G. Pointer 01 is NULL pointer and Pointer 02 is dangling pointer
    H. Really, Pointers can talk??
    I. Both Pointer 01 and Pointer 02 are dangling pointers
    J. Pointer 01 is normal pointer and Pointer 02 is NULL pointer   **[Marks: 20]**

Task 03:

Pointer 01: how are you?

Pointer 02: well, am not that good. Because the user, whenever he uses me, he never initializes me. I always look garbage.

Pointer 01: oh! People! They do it to me too! (A long silence)

Pointer 02: hey, you are different. Why do you lie? You cannot be changed.

Pointer 01: But am I not supposed to be holding NULL? If not any valid ones?

Pointer 02: Dude, what you always hold will be a valid one. May not be NULL!

Pointer 01: Come on. I was just trying to make you feel better. See, atleast the user who eavesdropped this will initialize you to NULL before using. Wont you??

Which of the following statement would be true with respect to above conversation??
    A. Pointer 01 is void pointer and Pointer 02 is also a void pointer

B.   B. Pointer 01 is a NULL pointer and Pointer 02 is a void pointer

C.   Pointer 01 is a constant pointer and Pointer 02 is a void pointer

D.   Pointer 01 is just a pointer like Pointer 02

E.   Pointer 01 is a void pointer and Pointer 02 is a constant pointer

F.   Pointer 01 is a constant pointer and Pointer 02 is just a pointer

G.   Pointer 01 is a constant pointer and pointer 02 is a NULL pointer

H.   Pointer 01 is a void pointer and Pointer 02 is just a pointer

I.   Pointer 01 is Pointer 02 but Pointer 02 is not Pointer 01

J.   Sorry, Pointers cannot talk   **[Marks: 20]**

Task 04:

Code the following tasks. Each one will carry 20 points.

4.1. Newton's Third Law: For every action there is equal and opposite reaction

4.2. Buddha's Causal Theory: This existing, that exists; this arising, that arises; this not existing, that does not exist; this ceasing, that ceases

4.3. The Principle of Sufficient Reason: There must be a reason why the big bang happened, but that does not mean it happened for any end or goal

4.4. The Mean: Aristotle's saw good as a 'mean' that stands between two bads: that of excess and that of deficiency

4.5. The Principle of Evidence: A weaker evidence can never destroy a stronger

4.6. Free Lunch Theorem: There is no such thing as a free lunch

4.7. Occam's razor: Simplest solution tends to be the right one. When presented with competing hypotheses to solve a problem, one should select the solution with the fewest assumptions

4.8. Brooks' law: Adding human resources to a late software project makes it later

4.9. Mark Twain: Never try to teach a pig to sing. You waste your time, and you annoy the pig

4.10. Murphy's Law: Anything that can go wrong, will go wrong   **[Marks: 200]**

** May The Force Be With You **