Data Structures and Algorithms Lab
01. Revisiting the Basics

Lab Code: 19ECSP201   **Lab No:** 01   **Semester:** III

Date: 14 Aug, 2019   **Batch:** C1

Theme: DSA Marathon – Catch Me if You Can

Objective: Operating and enhancing knowledge on Foundational Concepts of C and Structures

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Below listed are tasks which you will carry out in a team of three. The end time will be decided by the professor (Yayy!). Look out! Your scores are getting updated on the spreadsheet scoreboard.

Task 01:

You are given with a file named 'array_sum.c'. It has some errors in it. Debug and correct the program.   **[Points: 05]**

Task 02:

Write a code which will generate the following warning message: warning: return type of 'main' is not 'int'   **[Points: 05]**

Task 03:

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 whereas 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   **[Points: 10]**

Task 04:

Somewhere in a pointers party,

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   **[Points: 10]**

Task 05:
Write a program which would generate the output as in 5.exe   **[Points: 20]**

Task 06:
Write a program which would generate the output as in 6.exe   **[Points: 20]**

Task 07:
Write a program which would generate the output as in 7.exe   **[Points: 20]**

Task 08:
Identify three C keywords in the word maze below: **[Points: 20]**

m	a	n	g	o	a	p	p	l	e	o	n	c	e	u
p	o	n	a	t	i	m	e	i	w	h	i	l	e	n
m	g	o	f	l	d	p	u	m	a	b	a	g	s	r
u	d	d	o	d	o	c	t	o	r	i	s	g	o	o
m	m	y	r	c	c	d	o	n	a	l	d	s	d	d
b	h	e	l	p	r	c	h	e	n	n	a	i	x	p
a	e	w	w	k	k	g	e	t	p	a	r	t	y	s
i	y	m	y	o	u	f	r	i	e	d	e	g	g	r
z	h	c	t	i	w	s	c	a	u	u	d	i	i	s
h	a	r	r	y	p	o	t	t	e	r	z	o	k	e
g	o	o	g	l	e	f	a	c	e	b	o	o	k	s

Task 09:
You are given with a C file named 'pack-n-parcel.c'. The code has few errors. Debug them and get a working code.   **[Points: 30]**

Task 10:

For the nested structure given below, create a variable called **struct lot_confused lc** and write a program to print all the member values.

```
struct confused {
    int a;
};

struct more_confused {
    struct confused b;
    char a;
};

struct still_confused {
    struct more_confused b;
    float a;
};

struct lot_confused {
    struct still_confused b;
    double a;
};
```
                                                                                [Points: 30]

** May The Force Be With You **