Data Structures and Algorithms Lab

01. Revisiting the Basics

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

Date: 16 Aug, 2019 **Batch:** C2

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_product.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: *incompatible implicit declaration of built-in function 'printf'* **[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: 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.

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. 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 **[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 ****