

## TI184411 Algorithms & Computer Programming (English)

# Final Exam

Starting date: 12 April 2019  
Deadline: 19 April 2019, 23:59 WIB.  
Exam type: Open  
Send to: MM Irfan Subakti <yifana@gmail.com>  
CC to Irham Muhammad Fadhil <irham.mfadhil@gmail.com>  
with the subject: TI184411\_ALPRO\_FIN\_NRP\_Name  
File type and format: A zip file containing all of the .c source files & the declaration  
Filename format: TI184411\_ALPRO\_FIN\_NRP\_Name.ZIP

### Instruction

Please answer these questions as in the following.

1. Please create a program, namely `01_linked.c`. The purpose of this program is to sort a singly linked list in descending order, i.e., at least 5 items in the linked list. You can use any sorting algorithm, e.g., Bubble sort, Selection sort, Merge sort, etc. Once you have sorted the linked list, then insert an integer at the end of the linked list. **[20 points]**

#### Input

The integer number you want to insert to the linked list.

#### Output before the next insertion

The sorted elements in descending order.

#### Input

An integer.

#### Final Output

The sorted elements in descending order + the inserted integer.

2. Please create a program, namely `02_circular.c`. It's a singly circular linked list program. The initial data can be seen as in the following. Then please do the instruction below. **[20 points]**

#### 4 3 2 4 3

Please do these following operations.

- a. Insert "6" at the 3<sup>rd</sup> index of the linked list.
- b. Delete data at the 2<sup>nd</sup> index.
- c. Reverse the linked list.
- d. Sum them, i.e., the data, up.

3. Please create a program, namely `03_stack.c`. Given the infix notation, then by using the stack, please convert it to the prefix and postfix notation. An example can be seen below. **[20 points]**

**Input**

A \* (B + C) / D

**Output**

Prefix: /\* A + B C D

Postfix: A B C + \* D /

4. Please create two programs, namely `04a_display.c` and `04b_write.c`, which be able to perform the file operation as in the following.
- `04a_display.c` is responsible to display the content of the `.txt` file.
  - `04b_write.c` is responsible to write the data to the `.txt` file.
- Note: It's enough to have 5 words in the `.txt` file. **[20 points]**

5. Please create a program, namely `05_struct.c`. It has the data structure data as in the following.

```
struct data_mahasiswa {
    char nrp[100];
    char nama[100];
    char fakultas[100];
    char departemen[100];
};
data_mahasiswa mahasiswa[10]; /* 10 data of mahasiswa */
```

Then, please insert the student data into the struct (you can insert the data of any student you like) and please display each of this data. **[20 points]**

**Additional Instruction**

Please do these steps as in the following.

- A. To avoid plagiarism/cheating, every student needs to pledge and declare, then she/he must submit her/his **signed pledge and declaration** as in the following. Failed to do so will be resulted in getting 0 (zero) grade. Attach the **scanned/photo** of your *declaration* in your report.

“By the name of Allah (God) Almighty, herewith I pledge and truly declare that I have solved final exam by myself, didn't do any cheating by any means, didn't do any plagiarism, and didn't accept anybody's help by any means. I am going to accept all of the consequences by any means if it has proven that I have been done any cheating and/or plagiarism.”

[Place, e.g., Surabaya], [date, e.g., 19 April 2019]

<Signed>

[Full name, e.g., Mukidi Mukiyo]

[NRP, e.g., 05111340000xxx]

B. ZIP the files of 01\_linked.c, 02\_circular.c, 03\_stack.c, 04a\_display.c, 04b\_write.c, 05\_struct.c and your declaration (e.g., Declaration.PDF) into 1 (one) only .ZIP file, namely TI184411\_ALPRO\_FIN\_NRP\_Name.ZIP. Send this .ZIP file to yifana@gmail.com and CC-ed to irham.mfadhil@gmail.com.

C. Have a great day! Good luck! 🍀