

CS2021 ASSIGNMENT 12 (Due Date: Dec 31, 2021)

Question 1

- (a) C language is a compiled language or an interpreted language?
- (b) In the heading of a C program, it always includes a number of header files like below.

```
#include <stdio.h>
#include <math.h>
```

What is the purpose for adding such header files?

- (c) What is the purpose for the declaration of the variables and their data types in the beginning of the program?
- (d) State three C compilers which are commonly installed in a computer.
- (e) Owing to let a compiler to convert the source code of "printf" to machine code, which header file has to be included?
- (f) If we would like a C compiler to ignore a command, what could we add in the program source code file?

Question 2

- (a) What is the difference between a pseudo-code program and a C program source code?
- (b) A C program which can be compiled by a C compiler X. It might not be compiled by another C compiler Y. Explain the reason(s) why?

Question 3

This question is about the program command in Section 6.5 in the C Programming lecture note.

- (a) In the program, the header files "stdlib.h", "time.h" and "math.h" are included. Explain why they are included.

- (b) In the program, two commands are added above "main()".

```
#define PI 3.14159265358979323846
float randu(void);
```

Explain why they are added and why they are added above "main()".

- (c) In the function "randu()", "(float)" is put in a command.

```
randnum = (float) rand()/RAND_MAX;
```

Explain why it is added in here. If "(float)" is removed, which number will be returned by the function "randu()".

- (d) What is the purpose of the following command?

```
srand(time(NULL));
```

What will be the consequence if this command is removed?

Question 4

Suppose the program in Section 3.2 is modified as the following.

```
#include<stdio.h>
#include<stdlib.h>

main(int argc, char *argv[])
{
    int length, i, j;

    length = atoi(argv[1]);
    for(i = length; i >0 ; i--)
    {
        for(j = 0; j < i+1; j++)
            printf("*");
        printf("\n");
    }
}
```

The filename of the source code is now called "triangle.cpp" and the program has been compiled without error.

- (a) What is the value of "argc"?
- (b) What are the contents in "argv[0]" and "argv[1]" respectively?
- (c) What will you see on the screen if the following command is typed on the command prompt?

```
C:\>triangle 4
```

Please show your answer like the following.

```
C:\>triangle 4
```

WHAT YOU SEE BEFORE THE NEXT C:\>

```
C:\>
```