

Programming Design

Assignment 2 – Loops

March 20, 2018

Objectives

Practice and get familiar with the basics and flow control of C language. In this assignment you will make use of the subject matters in Chaps 2 and 3.

Problem Description

1. Write a program to print 9×9 multiplication table.
 - (a) Output the formatted 9×9 multiplication table. (50%)
 - (b) Output the formatted $m \times n$ multiplication table, where m and n ($m, n \in \{1, \dots, 100\}$) are input by the user. Your program needs to check the legality of input values. (50%)

```
hct103m@csie0[3:15pm]~>./a.out
| 0 1 2 3 4 5 6 7 8 9
-----
0 | 0 0 0 0 0 0 0 0 0 0
1 | 0 1 2 3 4 5 6 7 8 9
2 | 0 2 4 6 8 10 12 14 16 18
3 | 0 3 6 9 12 15 18 21 24 27
4 | 0 4 8 12 16 20 24 28 32 36
5 | 0 5 10 15 20 25 30 35 40 45
6 | 0 6 12 18 24 30 36 42 48 54
7 | 0 7 14 21 28 35 42 49 56 63
8 | 0 8 16 24 32 40 48 56 64 72
9 | 0 9 18 27 36 45 54 63 72 81

hct103m@csie0[4:56pm]~>./a.out
2 5
| 0 1 2 3 4 5
-----
0 | 0 0 0 0 0 0
1 | 0 1 2 3 4 5
2 | 0 2 4 6 8 10
```

Figure 1: Format of multiplication table

2. Write a program to calculate the following power sum and print its result:

$$\sum_{x=1}^n x^8 = 1^8 + 2^8 + \dots + n^8,$$

where n is input by the user. Your program should use a *doubly-nested loop* for the calculation, instead of `pow` function. Besides, it should also check the legality of input value.

Requirements

You MUST use

1. C style!
2. I/O functions
3. Flow of control

Never ever cheat!

Evaluation

- Correctness: 90%
- Styling: 10%

Submission

- **2018.04.01 (degrade by 10 points for each day delay)**
- Source code (assign1a.c, assign1b.c)
 - Show your information (Name, Student ID, Dept) as comments in the beginning of your code.
 - Zip and upload the files to iLMS.