

C Language Programming: Homework #7
Assigned on 12/20/2016(Tuesday), Due on 01/03/2017(Tuesday)

Part I:

This assignment allows you to practice passing pointers to function into another function. Write a complete program to do the following:

1. Assume there is a function declared as (1) ***double power(double, int)*** that calculates x^n if we call `power(x, n)`, a function declared as (2) ***double multiply(double, int)*** that calculate $x*n$ if we call `multiply(x, n)`, and a function declared as (3) ***double divide(double, int)*** that calculate x/n if we call `divide(x, n)`, where `x` must be double and `n` be integer.
2. Write a function ***double powerpower(...)*** that can compute $(x^n)^m$, $(x*n)^m$, $(x/n)^m$, where `powerpower()` must use four parameters: a pointer to function, one double and two integers.
3. Also remember to write functions ***divide()***, ***multiply()*** and ***power()***
4. use typedef to define a new type ***F*** which is a pointer to function
5. When executing your program, you can choose the values for `x`, `n`, and `m` by using `argc` and `argv`.
6. write the documentation

1. 先寫 ***double power(double, int)***, ***double multiply(double, int)***, ***double divide(double, int)*** 這三個function
2. 用typedef的方式宣告一個名稱為F的pointer to function
3. 寫一個***double powerpower(F, double, int, int)***，其中F為自己宣告的 pointer to function的 type
4. 透過argc,argv輸入 `x`, `n`, `m`，並且printf出 $(x^n)^m$, $(x*n)^m$, $(x/n)^m$ 的結果
- 5.檔案名稱hw7_1.c

Example:

```
./hw7_1 2 2 3
64.000000
64.000000
1.000000
```

Part II:

Repeat the Homework #3 by using (1) union and (2) union and bit-field without bitwise operators.

1.將hw3 type轉換分別用union + bitwise operators與 union + bit-field實作

2.執行時輸入兩個參數，第一個參數做判斷執行什麼動作(1 : int to bit pattern , 2 : float to bit pattern , 3 : bit pattern to float(%.23e))，第二個參數為輸入的值

3.檔案名稱為hw7_2(union + bitwise operators) hw7_3(union + bit-field)

Example:

```
./hw7_2 1 -1  
111111111111111111111111111111111111
```

```
./hw7_3 1 -1  
111111111111111111111111111111111111
```

Score:

hw7_1 :

typedef 15%
pointer to function 15%
command line 5%
answer 5%

hw7_2 : 20%(沒實作union + bitwise operators不給分)

hw7_3 : 20%(沒實作union + bit-field不給分)

report : 20%