計算機概論與程式設計
LAB5

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Lab5 : Program scope and basic pointer

- Question 1 : Dollars
- Question 2 : GCD

Question 1. Dollars

- The design allows the user to enter some dollars.
- Classify the currency value according to the input amount.
- Such as $1000, $500, $100, $10, $5, $1.
- TA will first input N (# of test_case)
  - N range = [1, 10]
- In each test case,
  - Input the amount of dollars
  - Classify them.

# of test_case

```
4
Enter a dollar amount: 12345
| 1000|  500|  100|   10|    5|    1|
|   12|    0|    3|    4|    1|    0|
Enter a dollar amount: 98765
| 1000|  500|  100|   10|    5|    1|
|   98|    1|    2|    6|    1|    0|
Enter a dollar amount: 45612
| 1000|  500|  100|   10|    5|    1|
|   45|    1|    1|    1|    0|    2|
Enter a dollar amount: 75319
| 1000|  500|  100|   10|    5|    1|
|   75|    0|    3|    1|    1|    4|
```

Question 1. Requirements

- Write a function to classify the dollars.
- The arguments of the function should be 1 integer and 6 pointers.
- **You should change the values pointed by the pointer.**
- Print the result in main function.

```
void pay_amount(int dollars, int *thousand, int *five_hundred, int *one_hundred, int *tens, int *fives, int *ones)
{
  // todo

}
```

Question 2. GCD(Greatest Common Divisor)

- TA will first input N (# of test_case)
  - N range = [1, 10]
- In each test case,
  - TA will input two numbers(a, b) randomly
  - a, b ranges = [1, 100].
  - Print the GCD(最大公因數) of a, b

# of test_case

```
3
a = 12
b = 24
The GCD is 12
a = 11
b = 46
The GCD is 1
a = 56
b = 48
The GCD is 8
```

Question 2. GCD(Greatest Common Divisor)

- Write one function with “Iterative” method.
- Function type needs to return a pointer of integer.
- Store the result in ans.
- Print the result in main function.

```
void gcd_iterative(int *m, int *n, int *ans)
{
    // todo


}
```

Grading

- Question 1 50%
- Question 2 50%
- Total 100%

Requirements

- Write **2** programs that can answer 2 questions respectively.
- Upload your code to E3 with file name
  - LAB5_1_<StudentID>.c/.cpp
  - LAB5_2_<StudentID>.c/.cpp