

Computer Programming 1 Lab

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Outline

- While
- For
- Exercise 3
- Bonus

While

While

```
while(condition){  
    statement(s);  
}
```

```
do{  
    statement(s);  
}  
while(condition);
```

While

Sample - 數字翻轉

Sample - 數字翻轉

輸入任意數字，並將其數字全部倒轉

Sample - 數字翻轉

Input

輸入一行包含一個整數，且不超過 2^{31}

Sample - 數字翻轉

Output

輸出翻轉過後的數字

Sample - 數字翻轉

Sample1

Input sample	Output sample
12345	54321

Sample - 數字翻轉

Sample2

Input sample	Output sample
5050	505

Sample - 數字翻轉

Hint

- 前面有 0 的話應消除

Sample - 數字翻轉

```
#include <stdio.h>

signed main(){
    int num; scanf("%d", &num);
    int ans = 0;
    while(num){
        ans = ans * 10 + num % 10;
        num /= 10;
    }
    printf("%d\n", ans);

    return 0;
}
```

For

For

```
for(init; condition; increment){  
    statement(s);  
}
```

For

```
for( ; ; ){  
    statement(s);  
}
```

```
while(1){  
    statement(s);  
}
```

For

Sample - 費氏數列

Sample - 費氏數列

我們將費氏數列定義如下：

$$F_0 = F_1 = 1$$

$$\forall n \in \mathbb{Z} \wedge n \geq 0, F_{n+2} = F_{n+1} + F_n$$

Sample - 費氏數列

Input

測資第一行包含一個 T ($T \in \mathbb{N}, T \leq 1000$) $T(T \in \mathbb{N}, T \leq 1000)$

接下來有 T 行，每行有一個 n 代表詢問費氏數列的第 n 項 ($n \in \mathbb{Z} \wedge 0 \leq n \leq 45$)

Sample - 費氏數列

Output

對於每筆測試資料輸出一行答案

Sample - 費氏數列

Sample1

Input sample	Output sample
3	1
0	2
2	3
3	

Sample - 費氏數列

```
#include <stdio.h>

signed main(){
    int T; scanf("%d", &T);
    while(T--){
        int n, a = 1, b = 1, c = 2; scanf("%d", &n);
        if(n == 0 || n == 1) printf("1\n");
        else{
            for(int i=0; i<n-2; i++){
                a = b;
                b = c;
                c = a + b;
            }
            printf("%d\n", c);
        }
    }
    return 0;
}
```

Exercise 3 - Find prime numbers in the interval

Find prime numbers in the interval

Write a program to print all the prime numbers between $[a, b)$.

If there are not prime numbers in the interval, please print "No\n".

If you use the prime number table directly, you will get 0 points.

Find prime numbers in the interval

Input

The input file may contain many positive integers, two integers a and b ($1 \leq a \leq b \leq 10^6$) per line. The input data a and b are both decimal numbers, and they are separated by exactly 1 space in the input line.

Find prime numbers in the interval

Output

For each test case, output the all of prime numbers (separated by a space) in the interval $[a, b)$.

Find prime numbers in the interval

Sample1

Input sample	Output sample
2 10	2 3 5 7
5 5	No

Find prime numbers in the interval

Scoring

Condition	Score
$1 \leq a \leq b \leq 10^3$	30
$1 \leq a \leq b \leq 10^4$	30
$1 \leq a \leq b \leq 10^5$	20
$1 \leq a \leq b \leq 10^6$	20

Find prime numbers in the interval

Hint

- You could use "Nested loop" to complete this exercise
- Nested Loop : while in for, for in while, while in while, for in for...
- Nested Loop : 你愛幾層就幾層

```
while(){  
    for(){  
        for(){  
            for(){  
                .....  
            }  
        }  
    }  
}
```

Tips

Tips - Time Complexity

Time Limit Exceeded

2MB

1849ms

Tips

壓常

Bonus - Find prime numbers in the interval +

Any Questions?