國立清華大學資訊工程學系

2022 計算機結構 Assignment 3

Deadline: 2022.10.31 23:30

◆ **Those two exercises are to practice procedure call and recursive call.**

Q1: Write a MIPS assembly program for the following C program.

```
#include <stdio.h>
#include <math.h>
int compare(int p,int q){
    if(p < q) return p + q;
    else return p;
}
int smod(int p ,int q){
    int div, divd;
    if(p > q) div = pow(2,p%4);
    else div = pow(2,q%4);
    divd = p*4+q;
    return divd % div;
}
int main(){
    int x,y,z,ans;
    printf("input x: ");
    scanf("%d",&x);
    printf("input y: ");
    scanf("%d",&y);
    printf("input z: ");
    scanf("%d",&z);
    ans = smod(compare(x,y),z);
    printf("result = %d\n",ans);
    return 0;
}
```

Input constraints : $0 \leq x \leq 100$, $0 \leq y \leq 100$, $0 \leq z \leq 100$
You must use the procedure (function) call to implement. Also, your program should terminal normally (the output should show "-- program is finished running --").

Output format example:

```
input x: 2
input y: 3
input z: 4
result = 0
```

Q2: Write a MIPS assembly program for the following C program.

```
#include <stdio.h>
int fib(int x){
    if(x == 0) return 0;
    else if(x == 1) return 1;
    else return (fib(x-1)+fib(x-2));
}
int re(int x,int y){
        if(y <= 0)return 0;
        else if(x <= 0) return 1;
        else return re(x,y-2)+re(x-5,y);
}
int main(){
        int x,y,z,ans;
        printf("input x: ");
        scanf("%d",&x);
        printf("input y: ");
        scanf("%d",&y);
        ans = re(fib(x),y);
        printf("result = %d\n",ans);
        return 0;
}
```

Input constraints : $0 \leq x \leq 10$, $0 \leq y \leq 25$
You must use the procedure (function) call to implement. Also, your program should terminal normally (the output should show "-- program is finished running --").

Output format example :

```
input x: 3
input y: 4
result = 2
```

◆ Submission (2 assembly programs)

Please name your assembly program with your student ID, for example:

“arch_hw3_p1_100000001.asm” & “arch_hw3_p2_100000001.asm”.

Use the eeclass (https://eeclass.nthu.edu.tw/) to submit your program.

◆ Grading Criteria

Correctness: 80%

Comment in program: 10%

Output format: 10%