## 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.

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

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

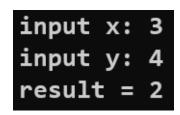
Output format example:

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 :  $0 \le x \le 10$ ,  $0 \le y \le 25$ 

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:

## 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%