```
**********************************************************
Report: hw3
Author: F74046022 陳冠仁 <jeremy851004@gmail.com>
Class: 乙班
Description:
How do you finish this homework?
隨機產生答案並將其存入 answer[]
將輸入的猜測存入 guess[]
比較 answer[]與 guess[]得出 H 與 X
H 等於位置數時結束遊戲

What did you learned from this homework?
如何利用 function 簡化程式碼並增加可讀性
**********************************************************
Code:
#include <stdio.h>
#include <stdlib.h>
#include <time.h>
#include <ctype.h>
#include <string.h>

int i, j;

int main(int argc, char *argv[])
{
        int n=*argv[1]-48, p=*argv[2]-48;
        int answer[p], guess[p];
        int h=0, x, digit_count;
        char temp[50];

        if(n<p){
                printf("\nINVALID INPUT\n\n\n");
                return 0;
        }

        printf("\n\n\n");
        printf("-------------MASTERMIND-------------\n");
        printf("------TYPE \"answer\" FOR ANSWER------\n");
```

```c
        printf("------TYPE  \"exit\"  TO...
EXIT------\n\n");

        rand_ans(n, p, answer);

        while(h!=p)
        {
                h=0, x=0;

                printf("GUESS %d NUMBERS FROM 1 TO %d : \n", p,
n);

                scanf("%s", &temp);

                if(!strcmp("answer", temp)){
                        print_answer(p, answer);
                        continue;
                }
                if(!strcmp("exit", temp))
                        break;

                digit_count = scan_digits(temp, guess);

                if(digit_count<p){
                        printf("NOT ENOUGH DIGITS\n\n\n");
                        continue;
                }
                if(digit_count>p){
                        printf("TOO MANY DIGITS\n\n\n");
                        continue;
                }

                h = calc_h_x(n, p, answer, guess, h, x);
        }
        //the main part of the game

        if(h==p)
```

```c
            printf("==========CONGRATULATION==========
\n\n\n");
        else
            printf("\n\n========THANKS FOR
PLAYING========\n\n\n");


        return 0;
}


int rand_ans(int n, int p, int answer[])
{
        srand(time(0));
        //uses time as the seed of rand()
        //does not generate the same set of rand()

        for(i=0; i<p; i++){
                do{
                        answer[i]=rand()%n+1;
                        for(j=0; j<i; j++){
                                if (answer[i]==answer[j]){
                                        answer[i]=0;
                                        break;
                                }
                        }
                }while(answer[i]==0);
        }
        //generates the answer randomly
        //numbers do not repeat
}


int print_answer(int p, int answer[])
{
        for(i=0; i<p; i++)
                printf("%d", answer[i]);
        printf("\n\n\n");
}
```

```c
int scan_digits(char temp[], int guess[])
{
    for(i=0, j=0; i<strlen(temp); i++){
        if(isdigit(temp[i])){
            guess[j]=temp[i]-48;
            j++;
        }
    }
    //scans the digits in the temp[]
    //put the digits in the guess[]

    return j;
}

int calc_h_x(int n, int p, int answer[], int guess[], int h,
int x)
{
    int a_count[n+1], g_count[n+1];

    for(i=0; i<p; i++)
        if(guess[i]==answer[i])
            h++;
    //calculates the number of H

    for(i=1; i<=n; i++){
        a_count[i]=0;
        g_count[i]=0;

        for(j=0; j<p; j++){
            if(i==answer[j])
                a_count[i]++;
            if(i==guess[j])
                g_count[i]++;
        }

        if(a_count[i]>g_count[i])
            x+=g_count[i];
        else
```

```
                        x+=a_count[i];
        }

        x-=h;
        //calculates the number of X

        printf("%dH%2dX\n\n\n", h, x);

        return h;
}
```

Compilation:
```
        gcc -o hw3 hw3.c
```

Execution:
```
        ./hw3 (N) (P)
```

Output:
```
------------MASTERMIND------------
------TYPE "answer" FOR ANSWER------
------TYPE  "exit"  TO... EXIT------

GUESS 3 NUMBERS FROM 1 TO 7 :
answer
631


GUESS 3 NUMBERS FROM 1 TO 7 :
123
0H 2X


GUESS 3 NUMBERS FROM 1 TO 7 :
631
3H 0X


===========CONGRATULATION==========
```