Profiling Lab

1 Objective:

This laboratory exercises guide you how to measure the program's performance using profiling. On completion of this laboratory, you should be able to

- Understand how to measure the program's running time
- Be aware the importance of tuning your program to be faster

2 Practice 1 - Profile

2.1 Activity 1 – familiarization with Profiling

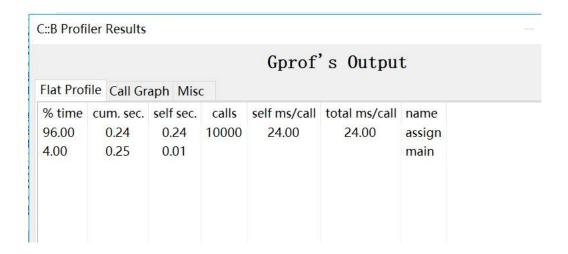
Type the following program that is a simple one dimensional matrix. It will initialize it with a value of 1.0; it then forms two loops to initialize it.

```
void main() {
    int i,j;
    float a[10000];
    for (i = 0; i <10000; i++)
        a[i] =1.0;
    for(i=0;j<10000;j++){
        for (j=1;j<=10000;i++){
            a[i] = a[j];
        }
    }
}</pre>
```

2.2 Activity 2 - add function

Now type the program, you can open my file and use cut and paste. Please note that a subroutine called assign is created. Forget about the meaning of this program, it is designed to make you familiarize with the profiling only.

Now enable profiling, compile and run the above program. you will get the following screen.



- 1) Explain why the hit count of assign() is 10000. (hint: look at the main())
- 2) How many functions in this program and explain why?
- 3) How many percentage of time the program spent in assign()?
- 4) The Total time is: 0.25 second in my machine (not the machine in the lab.). Please note that it varies form machine to machine. Explain the meaning of this 0.25 second.

2.3 Activity 3 – understands how the program affects the performance

Measure the total time of the following program with the same result.

Case 1

The time is:

```
Case 2
void main() {
    unsigned int i;
    unsigned int j;
    unsigned int max num = 1000000000;
    for (i = 0; i < max num; i++)
        j = i/2;
The time is:
Case 3
void main() {
    int i = 0;
    int j = 0;
    int max num = 1000000000;
    while (i < max_num){
        j = i/2;
        i = i + 1;
}
The time is:_____
Case 4
void main() {
    int i = -1;
    int j = 0;
    int max num = 1000000000;
    while (++i < max num)
        j = i/2;
        i = i + 1;
The time is:
Case 5
void prt(int i) {
    int j = i/2;
void main(){
    int max num = 100000000;
    for (int i = 0; i < max num; i++)
        prt(i);
```

The time is:_____

3 Practice 2 - Determine your machine's performance

3.1 Activity 1

Determine your machine's performance using timer functions provided by C library.

3.2 Activity 2

Determine your machine's performance using profiler