

California University of PA
Dept. of Computer Science, Info Systems, and Engineering Technology



ACET440 Computer Networking

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= Lab Report =

Lab 1 Summation

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Question 1:

- a. If we use $S_r(n)$ to denote the summation calculated by your program using recursive on given positive integer n , what is the biggest n on DRACO1 that your program can NOT correctly output $S_r(n)$?
- b. Is this n also the biggest integer for the $S(n)$ calculated by summation.c that uses a for loop? Why?

Answer 1:

- a. The largest that the recursive function can calculate correctly is an input of 92681. (See figure 2)
- b. Yes, the input for the “for” loop is the highest calculated number done correctly.
- c. This is because the data type unsigned int is used for sum which has a max value of 4,294,967,295 and when the input is 92682 it puts the sum over this max number and will overflow.

```
Student
Ctrl+Alt+Del USB Devices Fullscreen
bis3683@DRACO1:~$ gcc summation.c -o summation
bis3683@DRACO1:~$ ./summation
Sumation Calculator
Enter 0 to quit
Enter number: 1
The Original Sumation of 1 is 1.
The Recursive Sumation of 1 is 1.

Sumation Calculator
Enter 0 to quit
Enter number: 2
The Original Sumation of 2 is 3.
The Recursive Sumation of 2 is 3.

Sumation Calculator
Enter 0 to quit
Enter number: 3
The Original Sumation of 3 is 6.
The Recursive Sumation of 3 is 6.

Sumation Calculator
Enter 0 to quit
Enter number: 4
The Original Sumation of 4 is 10.
The Recursive Sumation of 4 is 10.

Sumation Calculator
Enter 0 to quit
Enter number: 5
The Original Sumation of 5 is 15.
The Recursive Sumation of 5 is 15.

Sumation Calculator
Enter 0 to quit
Enter number: 100
The Original Sumation of 100 is 5050.
The Recursive Sumation of 100 is 5050.

Sumation Calculator
Enter 0 to quit
Enter number: 1000
The Original Sumation of 1000 is 500500.
The Recursive Sumation of 1000 is 500500.

Sumation Calculator
Enter 0 to quit
Enter number: 10000
The Original Sumation of 10000 is 50005000.
The Recursive Sumation of 10000 is 50005000.

Sumation Calculator
Enter 0 to quit
Enter number: 100000
The Original Sumation of 100000 is 705082704.
The Recursive Sumation of 100000 is 705082704.

Sumation Calculator
```

Figure 1: Compile and Run of summation.c in DRACO1

The screenshot shows a Windows 10 desktop environment. A terminal window titled "bis3683@DRACO1:~/Lab1" is open, displaying the output of a program named "alarm". The program prompts the user to enter a number and then calculates its sum using both a recursive method and an iterative method. The desktop background is blue with a faint pattern. The taskbar at the bottom shows the Start button, a search bar, and several application icons. The system tray on the right indicates the time is 5:46 PM on 9/1/2022.

```
[bis3683@DRACO1:~/Lab1]$ ./alarm
1
Sumation Calculator
Enter 0 to quit
Enter number: 92681
The Original Sumation of 92681 is 4294930221.
The Recursive Sumation of 92681 is 4294930221.

1
Sumation Calculator
Enter 0 to quit
Enter number: 92682
The Original Sumation of 92682 is 55607.
The Recursive Sumation of 92682 is 55607.
```

Figure 2: Finding the max number for recursive and for loop