

# Fork Practice

Homework Assignment #7

ELEC462-002 System Programming

(Instructor: Prof. Suh, Young-Kyoon)

**Due: 01:59:59 pm, Thursday, May 4, 2023**

Write a C program that produces as many child processes as a user specifies. Each child process multiplies each digit of its own PID if that PID is *odd* and adds each digit if the PID is *even*. After that, the process must output the (adding or multiplying) result.

[Note] If there is any *zero* in the digits of an even PID, you should replace that zero with one and calculate the result. (If PID is 30233, then the result will be  $3 \times 1 \times 2 \times 3 \times 3 = 54$ .)

## <Precautions!!>

- Name your source code like: `hw7_s<StudentID>.c`.
- Zip the code and name it like `hw7_s<StudentID>.zip`.  
Ex) If your student ID is 2022123456, your file name would be `hw7_s2022123456.zip`.
- Upload your zip file into LMS assignments tab.

## <Constraints>

- Use the fork function.
- Child processes must run in a different process than the parent process.
- Each child process must be terminated after outputting the result value.
- The parent process must wait until all child processes are terminated before terminating.

Example)

- If the PID of the child process is 14859, the result should be  $1 \times 4 \times 8 \times 5 \times 9 = 1,152$ .
- If the PID of the child process is 14850, then the result should be  $1 + 4 + 8 + 5 + 0 = 18$ .

[Expected output including several examples]

```
[yksuh@macan:~/courses/ELEC462/homeworks/hw7$ gcc -o hw7 hw7.c
```

```
[yksuh@macan:~/courses/ELEC462/homeworks/hw7$ ./hw7
```

```
[Enter the number of child processes: 10
```

```
Child process 1 [PID - 14849]: result(odd) = 1152
```

```
Child process 2 [PID - 14850]: result(even) = 18
```

```
Child process 3 [PID - 14851]: result(odd) = 160
```

```
Child process 4 [PID - 14852]: result(even) = 20
```

```
Child process 5 [PID - 14853]: result(odd) = 480
```

```
Child process 6 [PID - 14854]: result(even) = 22
```

```
Child process 7 [PID - 14855]: result(odd) = 800
```

```
Child process 8 [PID - 14856]: result(even) = 24
```

```
Child process 9 [PID - 14857]: result(odd) = 1120
```

```
Child process 10 [PID - 14858]: result(even) = 26
```

```
All child processes completed.
```

```
[yksuh@macan:~/courses/ELEC462/homeworks/hw7$ ./hw7
```

```
[Enter the number of child processes: 5
```

```
Child process 1 [PID - 14863]: result(odd) = 576
```

```
Child process 2 [PID - 14864]: result(even) = 23
```

```
Child process 3 [PID - 14865]: result(odd) = 960
```

```
Child process 4 [PID - 14866]: result(even) = 25
```

```
Child process 5 [PID - 14867]: result(odd) = 1344
```

```
All child processes completed.
```

```
[yksuh@macan:~/courses/ELEC462/homeworks/hw7$
```

```
[yksuh@macan:~/courses/ELEC462/homeworks/hw7$ ./hw7
```

```
[Enter the number of child processes: 4
```

```
Child process 1 [PID - 14869]: result(odd) = 1728
```

```
Child process 2 [PID - 14870]: result(even) = 20
```

```
Child process 3 [PID - 14871]: result(odd) = 224
```

```
Child process 4 [PID - 14872]: result(even) = 22
```

```
All child processes completed.
```

```
[yksuh@macan:~/courses/ELEC462/homeworks/hw7$
```

```
[yksuh@macan:~/courses/ELEC462/homeworks/hw7$ ./hw7
```

```
[Enter the number of child processes: 4
```

```
Child process 1 [PID - 14874]: result(even) = 24
```

```
Child process 2 [PID - 14875]: result(odd) = 1120
```

```
Child process 3 [PID - 14876]: result(even) = 26
```

```
Child process 4 [PID - 14877]: result(odd) = 1568
```

```
All child processes completed.
```

```
[yksuh@macan:~/courses/ELEC462/homeworks/hw7$ █
```

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## **Q & A**

If you have a question, then contact TA by email ([jtu6568@gmail.com](mailto:jtu6568@gmail.com)). Or, leave your messages on LMS Q&A board.

## **Late Day Policy**

All exercises are due at 1:59:59 pm on the assigned due date. A grading penalty will be applied to late assignments. Any assignment turned in late will be penalized 50% per late day.

## **Plagiarism**

No plagiarism will be tolerated. Also, NEVER use ChatGPT. If the assignment is to be worked on your own, please respect it. If the instructor determines that there are substantial similarities exceeding the likelihood of such an event, he will call the two (or more) students to explain them and possibly to take an immediate test (or assignment, at the discretion of the instructor) to determine the student's abilities related to the offending work.