Operating Systems Programming Assignment 1

Matter of Life and Death

December 21, 2024

In this programming assignment we will try to solve an ancient problem with child processes and *forking* and *forking* and *forking*. In ancient times, Yousef and his friends were trapped in a cave while escaping from the Roman army. Instead of being captured, they decided to suicide. They decided to form a circle in the cave and to kill every third remaining person until on one was left. But Yousef, along with a friend from the group, wanted none of this suicide nonsense. They quickly calculated where he and his friend should stand in the vicious circle.

In our variation of the problem, we start with n people numbered from 1 to n around a circle, and we eliminate every *second* remaining person until only one survives. For example, ten people for a circle and elimination started. The elimination order will be 2, 4, 6, 8, 10, 3, 7, 1, 9, so 5 survives. In other words, we need to determine the survivor's number.

In this programming assignment, you required to write a C program using `fork()` system call so that each child process should produce the person who has been eliminated from the sequence and the parent process will determine and write the survivor on the screen.

You should write and test your application in Linux environment. It is strongly recommened that you install the Ubuntu distribution (the one for the book) and Linux Lite, which is also Ubuntu based, as virtual machine with Virtual Box on your computer. Also, the number of people should be given to the application from the commend line, like:

```
a.out 10
```