Gebze Technical University
Department Of Computer
Engineering CSE 312 /CSE 504
Spring 2024
Operating Systems
Homework #01
Part C (25pts)
Due Date: 13.05.2024

1. **Your task for this part of homework**
   What we expect from your new OS is
   - **You must create all your processes by using fork syscall.**
   - Loading multiple programs into memory: Kernel will be able to load multiple programs into memory.
   - Handling multi-programming: you use the Process Table that will hold the necessary information about the processes in the memory.
   - Handling Mouse and Keyboard Interrupts: Our given source code can handle these interrupts, and your kernel will handle and respond between multiple processes.

Random Process Spawning with Interactive Input Handling Strategy:

In this strategy, the operating system randomly chooses one of the programs and loads it into memory multiple times, each time creating a new process. These processes then enter an infinite loop, awaiting interactive input events such as mouse clicks or keyboard presses. Upon receiving an input event, the process reacts accordingly before returning to its idle state.

Interactive Input Priority Strategy:

In this strategy, processes are spawned with varying levels of priority based on the type of interactive input they handle. Processes handling high-priority input events,

such as keyboard interrupts for critical system commands, are given higher priority, while processes handling lower-priority input events, such as mouse clicks for non-critical actions, are given lower priority.

- Collatz

  You are going to find collatz sequence for each number less than
  100. You can either take input from the user or pass the number as a parameter.
  You can find information about (Collatz conjecture on internet). For each number you will show the number being interested in, and its collatz sequence and go to the next number.
  - Example for input 7
  - Output 7: 22, 11, 34, 17, 52, 26, 13, 40, 20, 10, 5, 16, 8, 4, 2, 1

- BinarySearch
  - Ex; Input : {10, 20, 80, 30, 60, 50, 110, 100, 130, 170} x = 110;
    Output : 6
- LinearSearch
  - Input : {10, 20, 80, 30, 60, 50, 110, 100, 130, 170} x = 175;
    Output
    : -1

- def long_running_program(n):
  result = 0
  for i in range(n):
  for j in range(n):
  result += i * j
  return result

  # Example usage
  # Use this without user input. There is no interaction with user for this.
  result = long_running_program(1000)

2. Rules for homework

a. Submit all your source files!!!
b. Submit ReadMe.txt as execution instructions.

c. Submissions without Makefile, Report, and ReadMe.txt will not be evaluated!
d. Start early!
e. It is not a group project. Do not share your answers with anyone in any circumstance. Any cheating means **NA** from the course directly.
f. Your homework report is very important, it should include your design decisions, your structures, your comments, codes, and results for each strategy with screen shots.