Lab 4

Part 1

You need to implement stack with LinkedList.

Use “emp.txt” file.

Read line in file and create employee object and push them on stack.

You will add items to head of the LinkedList. While removing you will remove item from head of the LinkedList.

Do following operations on Stack-

Push/Pop/Peek

Push employee objects (Created by reading file) on stack.

Note: You need to implement your own Linked-List. Do not use default Linked List (Java).

Part 2

Use “emp.txt” file.

Read line in file and create employee object and add them on queue. Implement Queue with LinkedList.

Note: You need to implement your own Linked-List. Do not use default Linked List (Java).

Part 3

Implement Queue with Array.

Here are two parts. You need to implement with

1. Fixed Front
2. Floating front

Do following operations on Queue-

Enqueue/Dequeue

Enqueue employee objects (Created by reading file) in Queue.

Part 4

Jacobsthal number are an integer sequence named after Ernst Jacobsthal. The sequence starts at 0 and 1, then each following number is found by adding the number before it to twice the number before that.

$$J_n = \begin{cases} 0 & \text{if } n = 0; \\ 1 & \text{if } n = 1; \\ J_{n-1} + 2J_{n-2} & \text{if } n > 1. \end{cases}$$

The sequence is defined as:

The first few numbers in the sequence are:

0, 1, 1, 3, 5, 11, 21, 43, 85, 171, 341, 683, 1365, 2731, …

Write a Java program that contains the following functions

1. long Jacobsthal_recursive (int n);
2. long Jacobsthal_iterative (int n);

Output can be in following format

$java Jacobsthal 10

Recursive version: 0, 1, 1, 3, 5, 11, 21, 43, 85, 171

Time taken to execute recursive version: XX.XX ms

Iterative version: 0, 1, 1, 3, 5, 11, 21, 43, 85, 171

Time taken to execute iterative version: XX.XX ms

What to turn in?

For local students and if possible Internet section students, demonstrate your program during lab or office hour and submit a final copy of your source code on blackboard before the assigned due date.

For students in India, submit a copy of your source code on blackboard before the assigned due date.