5118006-03 Data Structures

Homework 4.
Linked Array List

3 May 2024

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* Revised on Apr 26

Outline

- Due date: 7 PM, May 14 Tue
- Task
  - implement a Linked List Array data structure
  - make a video demo
- Submission: via LMS
  - source code files
  - video file (or URL)
- Evaluation
  - test (50%)
  - source code quality (30%)
  - video presentation (20%)

Linked Array List

- A hybrid of linked list and array list
  - each node consists of an array of N elements
  - a series of nodes are chained via the next pointer

- Take advantages of two different approaches
  - element shifts happens only within the array of a node
  - no need to allocate new memory every insert operation
  - no large memory is reserved from the beginning point

Operations

- lalist_insert
  - insert a given element to the array of the corresponding node
  - when the corresponding node is fully filled, create a new node
- lalist_remove
  - remove a specified element from the array of the corresponding
  - if the corresponding node becomes empty after the element removal, remove the node as well
- lalist_pack
  - Update the structure of a list (not the elements) such that the arrays are fully filled except last node

Video Presentation

- Take a 8-min video for demonstrating your program reviewing the source code
  - explain how you implement each operation
  - demonstrate different scenario of list updates
  - each one must take a part in presentation

- You can upload either one video file, an archive of multiple video files or a file indicating the URL of the video on the web

Remark

- Use of programming tools is not permitted
- No late submission will be accepted
- After submission, peer evaluation will follow
- The team members must work together at all activities for the homework
- Help desks will be offered