

**Lab report**

|  |  |
| --- | --- |
| **Course**: | Class Libraries and Data Structures |
| **Semester**: | 1st semester of the academic year **2021-2022** |
| **Major**: | Software Engineering |
| **Class**: | 2020 |
| **Student Name**: |  |
| **Student ID:** |  |
| **Teacher:** | ZHAO, Hengjun (赵恒军) |

**School of Computer and Information Science**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | | Containers, Templates, and Iterators | | | |
| Date | | September 27，2021 | Type | | √ Confirmatory  √ Design  □Comprehensive |
| 1. **Objective & Requirements**    1. Learn operator overloading in C++    2. Understand the concept of containers    3. Understand the concept of containers; can use template to define generic containers    4. Understand the difference between contiguous memory allocation and linked memory allocation; grasp the use of template to implement a container with linked storage    5. Know the use of iterator and understand its implementation details    6. Can use iterator to traverse a list to finish a certain task    7. Understand the concept of generic algorithms | | | | | |
| 1. **Experimental environment (**platform and software**)**   Windows 7 (or higher versions) + Visual Studio 2010 (or higher versions) | | | | | |
| 1. **Experimental content and design** (Main Content, Procedure, Codes and Results)   Task 1   1. For this task, you are provided with a container with linked storage. Based on the source codes, design a container with doubly linked list storage. For this you need to design the node structure and its fields for doubly linked list, design the fields and method interfaces of the container class, and design the fields and methods of the iterator inner class for the container. In particular, your design should support efficient insertion of elements both at the head and at the tail of the doubly linked list container. 2. Implement the container and its associated iterator inner class 3. Based on you implementation, implement the findBestPaidReverse() method for the Company class, which traverses the list of Employee from the tail to the head to find the employee with the highest salary. The findBestPaidReverse() method should be implemented using your designed and implemented iterators of the container. This means that your iterator should support the operator-- 4. You can refer to the guidance book (in Chinese) for more details of the lab requirements. | | | | | |
| 1. **Result analysis and discussion**（Analysis of experimental results and summing up the harvest and the existing problems） | | | | | |
| Comments & Evaluation | Content & Design (A-E) | | |  | |
| Procedure & Codes (A-E) | | |  | |
| Results (A-E) | | |  | |
| Analysis & Discussion (A-E) | | |  | |
| Score (A-E):  Feedback comments: | | | | |