

**Lab report**

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| **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**

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| Name | | Queue and Simulation | | | |
| Date | | Nov 22，2021 | Type | | □Confirmatory  √ Design  □Comprehensive |
| 1. **Objective & Requirements**    1. Understand the concept of container adapter    2. Know the implementation the queue container adapter in the STL    3. Grasp the use of queue container in a real application    4. Know the concept of simulation and can use simulation to solve a real problem    5. Know about the queueing theory and the exponential distribution theory | | | | | |
| 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  Improve the car wash simulation problem in the following ways based on the codes and slides sent to you:   * 1. Do not restrict the capacity of the car wash station.   2. The inter-arrival time should be generated from an exponential distribution randomly. An exponential distribution has a distribution function   The parameter is based on the mean inter-arrrival time from the user’s input, that is,   * 1. The service time for each car should be generated from an exponential distribution   ,  where  with mean service time provided by the user. Note that mean service time should be less than mean arrival time which means should be greater than   * 1. To generate a sequence satisfying exponential distributions, you could adopt the formula:   for inter-arrival time; or  for service time, with *p* a random value in (0, 1) by uniform distribution.   * 1. Output the average waiting time and maximal queue length, using a large amount of simulation data. See if your calculated average waiting time equals:   1.对car.h的改动    2.对car.cpp的改动      3.对washCmp.h的改动    4.对washCmp.cpp的改动        5.对main.cpp无改动 | | | | | |
| 1. **Result analysis and discussion**（Analysis of experimental results and summing up the harvest and the existing problems）   Result：    Under the guidance of Mr. Zhao, I understand the design and implementation principle of queue data structure. Mr. Zhao listed the car washing problems in the experimental class, which made me have a deeper understanding of the queue and how to use the queue to solve practical problems. Queue is a special linear table, which only allows deletion at the front end of the table and insertion at the back end of the table. Like stack, queue is a linear table with limited operation. The end that performs the insertion operation is called the tail of the queue, and the end that performs the deletion operation is called the head of the queue.  Queue is a special linear table, which only allows deletion at the front of the table and insertion at the back of the table. Like stack, queue is a linear table with limited operation. The end that performs the insertion operation is called the tail of the queue, and the end that performs the deletion operation is called the head of the queue. | | | | | |
| Comments & Evaluation | Content & Design (A-E) | | |  | |
| Procedure & Codes (A-E) | | |  | |
| Results (A-E) | | |  | |
| Analysis & Discussion (A-E) | | |  | |
| Score (A-E):  Feedback comments: | | | | |