

**Lab report**

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| **Course**: | Class Libraries and Data Structures |
| **Semester**: | 1st semester of the academic year **2020-2021** |
| **Major**: | Software Engineering |
| **Class**: | 2019 |
| **Student Name**: | 冯春霖 |
| **Student ID:** | 222019321062074 |
| **Teacher:** | ZHAO, Hengjun (赵恒军) |

**School of Computer and Information Science**

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| Name | | Queue and Simulation | | | |
| Date | | Dec，2020 | 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 larger than   * 1. To generate a sequence satisfying exponential distributions, you could adopt the formula:   or  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. **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: | | | | |