Operational Specification Template

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| **Student** | 阙俊杰；任兵兵 | **Date** | 7/16/2015 |
| **Program** | Assignment8 | **Program #** | 8 |
| **Instructor** | 荣国平 | **Language** | Java |

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| **Scenario Number** | **1** | **User Objective** | To solve the Sudoku game | |
| **Scenario Objective** | | To illustrate operation | | |
| **Source** | **Step** | **Action** | | **Comments** |
| User | 1 | Enter one line of numbers(blank as 0 ,without spaces) | | Input the number of Sudoku game(left to right row by row) |
| System | 2 | Check the data input | | Whether error in data is checked |
| System | 3 | Analyze the input | | Create a char array with data input |
| System | 4 | Report error to user or report OK | | If error exists, report |
| System | 5 | Solve the Sudoku games | |  |
| System | 6 | Print the answer | |  |
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Functional Specification Template

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| **Student** | | | 阙俊杰；任兵兵 | | **Date** | 7/16/2015 |
| **Program** | | | Assignment8 | | **Program #** | 8 |
| **Instructor** | | | 荣国平 | | **Language** | JAVA |
|  | | | | | | |
| **Class Name** | | Program8 | | | | |
| **Parent Class** | |  | | | | |
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| **Attributes** | | | | | | |
|  | **Declaration** | | | **Description** | | |
|  | String str | | | Store the input numbers | | |
|  | int sudoku[] | | | Store the numbers that already checked and normalized | | |
|  | ArrayList <Integer> blank | | | To store the blank information(blank as 0 in input phrase) | | |
|  | ArrayList<Integer> filled | | | To store the filled places (input numbers except 0) | | |
|  | | | | | | |
| **Items** | | | | | | |
|  | **Declaration** | | | **Description** | | |
|  | public boolean checkIn | | | To check whether it’s right data | | |
|  | public void normalize | | | To normalize the numbers and put the numbers in array | | |
|  | public boolean checkOut | | | To check whether it ‘s done | | |
|  | public void workOut | | | To solve the problem. | | |
|  | public boolean simpleOut | | | To fill in the place with a number | | |
|  | public boolean complexOut | | | To run when trying to fill(cannot ensure it’s successful try) | | |
|  | public void print | | | To print the answer | | |

State Specification Template

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| Student | | 阙俊杰；任兵兵 | | | Date | | 7/16/2015 |
| Program | | Assignment8 | | | Program # | | 8 |
| Instructor | | 荣国平 | | | Language | | Java |
|  | | |  | | | | |
| **State Name** | | | | **Description** | | | |
| Start | | | | Start condition for system | | | |
| Check input | | | | The state of a system after inputting numbers for Sudoku | | | |
| Fail | | | | Input error | | | |
| normalize | | | | Load the input to an array | | | |
| Solve the problem | | | | To fill in the blank one by one | | | |
| Done | | | | All blank was filled rightly | | | |
| **Function/Parameter** | | | | **Description** | | | |
| boolean CheckIn() | | | | Judge the input. | | | |
| boolean checkout() | | | | Judge whether it’s done | | | |
|  | | | |  | | | |
|  | | | |  | | | |
| **States/Next States** | | | | **Transition Condition** | | **Action** | |
| Start | | | |  | |  | |
| Start | | | No transition from Start to Start | |  | |
| Check input | | | Input from console | | Check the input | |
| Fail | | | No transition from Start to Fail | |  | |
| normalize | | | No transition from Start to normalize | |  | |
| Solve the problem | | | No transition from Start to Solve the problem | |  | |
| Done | | | No transition from Start to Done | |  | |
| Check input | | | |  | |  | |
| Start | | | No transition from Check input to Start | |  | |
| Check input | | | No transition from Check input to Check input | |  | |
| Fail | | | Check In() be false | | Exit | |
| normalize | | | Check In() be true | | Begin normalizing | |
| Solve the problem | | | No transition from Check Input to Solve the problem | |  | |
| Done | | | No transition from Check Input to Done | |  | |
| Fail | | | |  | |  | |
| Start | | | No transition from Fail to Start | |  | |
| Check input | | | No transition from Fail to Check Input | |  | |
| Fail | | | No transition from Fail to Fail | |  | |
| normalize | | | No transition from Fail to normalize | |  | |
| Solve the problem | | | No transition from Fail to Solve the problem | |  | |
| Done | | | No transition from Fail to End | |  | |
| normalize | | | |  | |  | |
| Start | | | No transition from Normalize to Start | |  | |
| Check input | | | No transition from Normalize to Check Input | |  | |
| Fail | | | No transition from Normalize to Fail | |  | |
| Solve the problem | | | True | | Beginning the solving | |
| Done | | | No transition from Normalize to Done | |  | |
| Solve the problem | | | |  | |  | |
| Start | | | No transition from Solve the problem to Start | |  | |
| Check input | | | No transition from Solve the problem to Check Input | |  | |
| Fail | | | false | | Exit and report invalid game | |
| normalize | | | No transition from Solve the problem to normalize | |  | |
| Solve the problem | | | No transition from Solve the problem to Solve the problem | |  | |
| Done | | | True | | Print the answer and end | |
| Done | | | |  | |  | |
| Start | | | No transition from Done to Start | |  | |
| Check input | | | No transition from Done to Check Input | |  | |
| Fail | | | No transition from Done to Fail | |  | |
| normalize | | | No transition from Done to normalize | |  | |
| Solve the problem | | | No transition from Done to Solve the problem | |  | |
| Done | | | No transition from Done to Done | |  | |

Logic Specification Template

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| Student | 阙俊杰；任兵兵 | Date | 7/16/2015 |
| Program | Assignment8 | Program # | 8 |
| Instructor | 荣国平 | Language | Java |

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| **Design** | Operational Specification |
| **References** | Functional Specification |
|  | State Specification |
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| --- | --- |
| **Parameters** | String str |
|  | int sudoku[] |
|  | ArrayList <Integer> blank |
|  | ArrayList<Integer> filled |

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| Start by getting input |
| Analyze the numbers input |
| Load them to an array sudoku[] |
| Loop for solving the problem |
| Check if it’s done |
| Seek for proper place to fill in |
| Fill in the place with correct number |
| Print the answer |
| End |
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