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| Queue data structure  **Name: Queue** | | |
| **Definition:**  Value is the list’s type | | |
| **Input:** | | |
| **Invariable:** | | |
| **Operations** | | |
| **Name** | **Input** | **Output** |
| createQueue  **constructor** |  | Creates a new Queue |
| add  **modifier** | Queue, value | Queue within value |
| remove  **modifier** | Queue | Removes the value at queue’s header |
| element  **analyzer** | Queue, value | Current value at header |
| Size  **analyzer** | Queue | Queue’s items quantity |
| poll  **analyzer, modifier** | Queue, Integer | Value at queue’s header, Queue without previous value at header |
| peek  **analyzer** | Queue | Value at queue’s header |
| offer  **modifier** | Queue, value | Queue within value given (at the end of the queue) |

Operations

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| **Operation:**  createQueue | | | |
| **Operation type:** constructor | | | |
| **Input** | **Output** | **Precondition** | **Postcondition** |
|  | Creates a new Queue | true | Creates a Queue empty |
| Creates a new Queue which can be used. | | | |

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| **Operation:**  add | | | |
| **Operation type:** modifier | | | |
| **Input** | **Output** | **Precondition** | **Postcondition** |
| Queue, Value | Queue within the new value | Queue must be initialized | Adds the new value at the end of the queue |
| Adds the value given to the Queue | | | |

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| **Operation:**  remove | | | |
| **Operation type: modifier** | | | |
| **Input** | **Output** | **Precondition** | **Postcondition** |
| Queue | Queue without the first element | Queue must be initialized and have at least 1 element | Removes the first element (current older) of the queue |
| Removes the first element (header) of the Queue | | | |

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| **Operation:**  element | | | |
| **Operation type:** analyzer | | | |
| **Input** | **Output** | **Precondition** | **Postcondition** |
| Queue | First element of the queue | Queue must be initialized | Gets the first value of the queue (header) |
| Gets the first value (current older) of the Queue | | | |

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| **Operation:**  size | | | |
| **Operation type:** analyzer | | | |
| **Input** | **Output** | **Precondition** | **Postcondition** |
| Queue | Integer with the queue’s item Quantity | Queue must be initialized | The Integer will be the size of the queue (n>= 0) |
| Gets the current size of the Queue | | | |

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| **Operation:**  poll | | | |
| **Operation type:** modifier | | | |
| **Input** | **Output** | **Precondition** | **Postcondition** |
| Queue | First value of the queue | Queue must be initialized and have at least 1 item | Gets the first value of the queue (header) and removes it from queue |
| Gets and removes the first value of the queue | | | |

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| --- | --- | --- | --- |
| **Operation:**  peek | | | |
| **Operation type:** analyzer | | | |
| **Input** | **Output** | **Precondition** | **Postcondition** |
| Queue | First element of the queue | Queue must be initialized | Gets the first value of the queue (header) |
| Gets the first value (current older) of the Queue | | | |

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| --- | --- | --- | --- |
| **Operation:**  offer | | | |
| **Operation type:** modifier | | | |
| **Input** | **Output** | **Precondition** | **Postcondition** |
| Queue, value | Adds the new value to the queue | Queue must be initialized | Adds the new value to the queue and put it at the end of the queue |
| Adds a new value to the Queue | | | |