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| NAME | QUEUE |
| REPRESENTATION | Java Queue |
| INVARIANT | Size >= 0 |
| OPERATIONS | Add: Element  Delete 🡪 Element  Peek 🡪 Element  Size 🡪 integer |

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| Add: Element  “Insert a new Element in the Queue”  Pre: ø  Pos: The element is inserted at the end of the queue |

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| Delete 🡪 Element  “Delete the front element of the QUEUE”  Pre: ø  Pos: Get and erase the front item |

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| Peek 🡪 Element  “Get the front element of the QUEUE”  Pre: ø  Pos: Returns the front element |

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| Size 🡪 integer“Get the QUEUE size” Pre: size >= 0  Pos: Returns the QUEUE size |

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| NAME | HASH TABLE |
| REPRESENTATION | HashTable in Java Example | Java HashTable Tutorial |
| INVARIANT |  |
| OPERATIONS | HashFunction: Key Search: Key 🡪 Value  Insert: Key, Value  Delete: Key |

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| HashFunction: Key  “”  Pre:  Pos: |

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| Search: Key 🡪 Value  “Get the value searched”  Pre: ø  Pos: Returns the element found |

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| Insert: Key, Value  “Add a new element in the hash table”  Pre: Key && Value ≠ null  Pos: Insert the element in the hash table |

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| Delete: Key  “Delete a element with a key”  Pre: Key ≠ null  Pos: Erase the found element |

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| NAME | STACK |
| REPRESENTATION | Stack Class in Java Explained with Examples | CodeAhoy |
| INVARIANT | Size >= 0 |
| OPERATIONS | Push: Element  isEmpty 🡪 Boolean  Top 🡪 Element  Pop 🡪 Element  Clear  Size 🡪integer |

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| Push: Element  “Add a new element in the Stack”  Pre: Element ≠ null  Pos: The element has added into the stack |

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| isEmpty 🡪 Boolean  “Says if the Stack is empty”  Pre: ø  Pos: Yes or Not if its empty |

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| Top 🡪 Element  “Get the first element”  Pre: ø  Pos: returns the first element in the stack |

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| Pop 🡪 Element  “Delete the first element”  Pre = ø  Pos= The first element must be eliminated |

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| Clear  “Clear the entire stack”  Pre: ø  Pos: a empty stack |

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| Size 🡪integer  “Get the size of the Stack”  Pre : ø  Pos: Get an integer with the size of the STACK |

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| NAME | HEAP |
| REPRESENTATION | Heap Data Structure - GeeksforGeeks |
| INVARIANT |  |
| OPERATIONS |  |