# FALL24- NBB5 – SFT221

FUNCTION SPECIFICATION FILE

# Members

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# Function Description

**Function Name:** addShipmentToBestTruck

**Parameter List:**

|  |  |  |
| --- | --- | --- |
| Parameter Name | Type | Description |
| trucks | Array | An array of trucks to consider for the shipment. |
| map | Map | The map containing the buildings. |
| shipment | Shipment | The shipment to be assigned. |
| numOfTrucks | Integer | The number of trucks in the array. |
|  |  |  |

Returns: Integer - The index of the assigned truck, or -1 if no suitable truck is found.

Description: Adds a shipment to the most suitable truck from the given list. The best truck is determined based on available room, limiting factor, and least diversion. If a suitable truck is found, the shipment is added to it.

**Function Name:** findTruckForShipment

**Parameter List:**

|  |  |  |
| --- | --- | --- |
| Parameter Name | Type | Description |
| trucks | Array | An array of trucks to consider for the shipment. |
| map | Map | The map containing the buildings. |
| shipment | Shipment | The shipment to be assigned. |
| numOfTrucks | Integer | The number of trucks in the array. |
|  |  |  |

Returns: Integer - The index of the best truck, or -1 if no suitable truck is found.

Description: Finds the best suitable truck for a shipment. The best truck is determined based on available room, limiting factor, and least diversion.

**Function Name:** compareTrucksForShipment

**Parameter List:**

|  |  |  |
| --- | --- | --- |
| Parameter Name | Type | Description |
| left | Pointer | Pointer to the left truck for comparison. |
| right | Pointer | Pointer to the right truck for comparison. |
| map | Map | The map containing the buildings. |
| shipment | Shipment | The shipment to be assigned to a truck. |
|  |  |  |

Returns: Integer - A positive value if the left truck is better suited, a negative value if the right truck is better suited, or zero if they are considered equal.

Description: Compares two trucks to determine their suitability for a shipment, considering limiting factors and least diversion.

## **Function Name:** hasTruckRoomForShipment

**Parameter List:**

|  |  |  |
| --- | --- | --- |
| Parameter Name | Type | Description |
| trucks | Array | An array of trucks to consider for the shipment. |
| shipment | Shipment | The shipment to be assigned. |
|  |  |  |

Returns: Boolean - True if the truck has enough room, false otherwise.

Description: Checks if a truck has sufficient room for a shipment by comparing its weight and volume capacity against the shipment's weight and volume.

## **Function Name:** calculateLimitingFactor

**Parameter List:**

|  |  |  |
| --- | --- | --- |
| Parameter Name | Type | Description |
| truck | Truck | The truck for which to calculate the limiting factor. |

Returns: Float - The limiting factor as a percentage.

Description: Calculates the limiting factor of a truck for a shipment by comparing the truck's weight or volume (whichever is larger) with the shipment's weight or volume.

## **Function Name:** addShipmentToTruck

**Parameter List:**

|  |  |  |
| --- | --- | --- |
| Parameter Name | Type | Description |
| truck | Truck | The truck to which the shipment should be added. |
| shipment | Shipment | The shipment to be added to the truck. |
|  |  |  |

Returns: None

Description: Adds a shipment to a specified truck, reducing the truck's available weight and volume by the shipment's weight and volume.

## **Function Name**: printTruckPath

**Parameter List:**

|  |  |  |
| --- | --- | --- |
| Parameter Name | Type | Description |
| truck | Truck | The truck for which to print the path. |
| map | Map | The map containing the buildings. |
| shipment | Shipment | The shipment to be assigned. |

Returns: None

Description: Prints the route or path information of a truck, displaying relevant details about the truck's route and destination.