# Function Description

**Function Name:** displayPercentageUsage

**Module Name:** Truck

**Parameter List:**

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| --- | --- | --- |
| Parameter Name | Type | Description |
| t | struct Truck\* | the truck for usage calculation |
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**Returns:** the value of the percentage of usage of the truck, expressed in double data type or -1 if truck's information is invalid. The return type would be in double data type.

**Description:** Display and find out the percentage of current usage of the truck by accepting a Truck structure t which contains information of a specific truck.

**Function Name:** findBestRoute

**Module Name:** Truck

**Parameter List:**

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| --- | --- | --- |
| Parameter Name | Type | Description |
| r | const struct Route\* | Contains information of the route for the truck |
| dest | const struct Point\* | Contains information of the destination for shipment delivery |
| m | const struct Map\* | Contains information of the map of the city |
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**Returns:** The route of shortest distance from the start location of the route to the destination or empty route if destination cannot reach.

**Description:** Calculate the best route of the truck based on the provided route towards the destination on the given map.

**Function Name:** checkAvailableSpaces

**Module Name:** Truck

**Parameter List:**

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| --- | --- | --- |
| Parameter Name | Type | Description |
| t | struct Truck\* | Contains information of a particular truck for usage calculation |
| s | struct Shipment\* | Contains information of a particular shipment for delivery |
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**Returns:** 1 if the truck has available spaces for the shipment or 0 if no available spaces of the truck for the shipment. The return type would be an integer.

**Description:** Check and calculate the current available spaces of the truck, depending on the Truck and Shipment structures.

**Function Name:** addDelivery

**Module Name:** Shipment

**Parameter List:**

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| --- | --- | --- |
| Parameter Name | Type | Description |
| arr | struct Truck\* | Contains information of an array of all the trucks for shipment delivery |
| m | const struct Map\* | Contains information related to the map of the city |
| s | const Struct Shipment\* | Contains information of the details of a particular shipment for delivery |
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**Returns:** 1 if successful assigned a truck for shipment or -1 if all truck is not available or -2 if cannot assign truck for delivery or -3 if data incorrect. The return type would be in integer data type.

**Description:** Adding shipment to the truck’s delivery list, it calls functions to check the available trucks based on the current location of the truck on the given map. Based on that information, the function could determine the best route of the trucks, and then assign a truck for delivery and update truck's usage.

**Function Name:** checkInput

**Module Name:** Shipment

**Parameter List:**

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| --- | --- | --- |
| Parameter Name | Type | Description |
| row | int\* | Represents the updated row of the destination in the map if the shipment information is valid |
| col | int\* | Represents the updated column of the destination in the map if the shipment information is valid |
| weight | const double | Represents the weight of the shipment |
| volume | const double | Represents the volume size of the shipment |
| location | const char\* | Represents the destination on the map |
| m | const struct Map\* | Contains information of the map of the city |
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**Returns:** 1 if shipment information is valid or 0 if user entered "0 0 x" for exit the program or -1 if weight is not valid or -2 if volume is not valid or -3 if destination is not valid. The return type would be in integer data type.

**Description:** User input Validation for checking the shipment information. For example, it would check the row and column on the given map, followed by ensuring that the weight and volume of the shipment is within the limits set. After that, the function would validate the specific location on the map as the destination.

**Function Name:** assignTruck

**Module name:** Shipment

**Parameter List:**

|  |  |  |
| --- | --- | --- |
| Parameter Name | Type | Description |
| arr | struct Truck\* | Contains information of the array of all the trucks for shipment delivery |
| r | const struct Route\* | Contains information of the best routes of all the trucks |
| s | const struct Shipment\* | Contains information of a particular shipment for delivery |
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**Returns:** 10 if assigned to Blue Truck or 11 if assigned to Green Truck or 12 if assigned to Yellow Truck or -1 if destination cannot be reached and not eligible point to divert from the route.

**Description:** Assign a truck for delivery and update the truck usage information. The returned integer value could be considered as the status code of the truck assignment.

**Function Name:** checkShipmentVolume

**Module Name:** Shipment

**Parameter List:**

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| --- | --- | --- |
| Parameter Name | Type | Description |
| volume | double | Represents the volume size of the shipment |
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**Returns:** 1 if matched the correct size or 0 if not matched the correct size

**Description:** Check the shipment volume size if it matches the correct sizes: 0.5, 1, 5. The function would return an integer as the status code of the volume validity.

**Function Name:** checkShipmentWeight

**Module name:** Shipment

**Parameter List:**

|  |  |  |
| --- | --- | --- |
| Parameter Name | Type | Description |
| weight | double | Represents the weight of the shipment |
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**Returns:** 1 if matched the correct shipment weight or 0 if not matched the correct shipment weight

**Description:** Check the shipment weight if it is 1-1200 (kg). The function would return an integer as the status code of the weight validity.