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Abstract

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Function specification

SFT244 Milestone 3

# Function Description

**Function Name:** findTruckForShipment

**Parameter List:**

|  |  |  |
| --- | --- | --- |
| Parameter Name | Type | Description |
| Map | struct | the map of the delivery area with building in it |
| Trucks | struct | an array of trucks including the route for each of the trucks |
| numTrucks | struct | the number of trucks in the array of trucks |
| shipment | struct | a data structure containing the size and weight of the shipment |
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**Returns:** An integer representing the index of the truck in the trucks array on which the shipment should be placed. If no truck can take the shipment, then -1 is returned

**Description:** Finds the best truck for a shipment. It considers both the load on the truck, the size and weight of the shipment, and the route of the truck to try to place it on a truck which goes closest to the destination. If there is no truck that can deliver the shipment, it returns -1.

**Function Name:** IsValidSize4Truck

**Parameter List:**

|  |  |  |
| --- | --- | --- |
| Parameter Name | Type | Description |
| truck | struct | the truck in its current state |
| size | double | the volume of a box to be checked for validity. |
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**Returns:** “int”, 1: adding the package size to the truck’s carried volume is over than the maximum cargo volume limit. 0: adding the package size exceeds the maximum cargo volume, making it an invalid size.

**Description:** This function checks if adding a package's volume to a truck, whose initial capacity is ≤ TRUCK\_MAX\_SIZE, keeps it within the limit. Returns 1 if not overloaded, 0 if overloaded.

**Function Name:** IsValidWeight4Truck

**Parameter List:**

|  |  |  |
| --- | --- | --- |
| Parameter Name | Type | Description |
| truck | struct | the truck in its current state |
| weight | int | The weight of shipment |
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**Returns:** “int”, 1: adding the package weight to the truck’s carried weight is over than the maximum cargo weight limit. 0: adding the package weight exceeds the maximum cargo weight, making it an invalid weight.

**Description:** This function checks if adding a package's weight to a truck, whose initial capacity is ≤ TRUCK\_MAX\_WEIGHT, keeps it within the limit. Returns 1 if not overloaded, 0 if overloaded.

**Function Name:** isValidSize

**Parameter List:**

|  |  |  |
| --- | --- | --- |
| Parameter Name | Type | Description |
| size | float | the size of a box to be checked for validity |
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**Returns:** “int” 1: The box size is not a standard size (0.5, 1, or 2 cubic meters). 0: Indicates that the box size is a valid standard size.

**Description:** This function validates a given 'boxsize'. It compares 'boxsize' against predefined constants 'minSize', 'halfSize', and 'maxSize'. If a match is found, it prints "valid" and returns 1; otherwise, it prints error message and returns 0, indicating the box size is not valid.

**Function Name:** IsTruckFull

**Parameter List:**

|  |  |  |
| --- | --- | --- |
| Parameter Name | Type | Description |
| truck | struct | truck with its current state |
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**Returns:** “int”1: Indicates that the truck’s weight is equal to or exceed the maximum cargo weight (TRUCK\_MAX\_WEIGHT) and size is equal to or exceed the maximum cargo size (TRUCK\_MAX\_SIZE). 0: Indicates that the truck can still receive packages.

**Description:** This function checks if the truck's weight more than > 1500 or van's volume is more than 48. If any or this is true truck cannot receive anything else.