# Function Description

**Function Name:** findValidTruckPaths

**Parameter List:**

|  |  |  |
| --- | --- | --- |
| Parameter Name | Type | Description |
| Shipment | Struct shipment | The shipment that needs to be transported |
| Truck | Struct truck | The truck that will carry the shipment |
| Map | Const struct map\* | The map containing the routes and destinations |
| Routes | Struct Route routes[MAX\_ROUTE] | Array to store valid routes |
| Size | Int\* | Pointer to store the number of valid routes found |
|  |  |  |
|  |  |  |

**Returns:** This function does not return a value but updates the routes array and size parameter.

**Description:** This function finds valid truck paths that reach the given shipment destination. It iterates through the allocated shipments of the truck and checks each route for validity. If a route is valid, it is added to the routes array, and the count of valid routes is updated.

**Function Name:** hasDestination

**Parameter List:**

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| --- | --- | --- |
| Parameter Name | Type | Description |
| Route | Const struct Route\* | The route to be checked |
| Shipment | Struct Shipment | The shipment with the target destination |
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|  |  |  |

**Returns:** Returns 1 if the route has the shipment’s destination, otherwise returns 0.

**Description:** This function checks if the given route includes the shipment's destination. It is used to verify whether a particular route is suitable for delivering the shipment.

**Function Name:** printRoute

**Parameter List:**

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| --- | --- | --- |
| Parameter Name | Type | Description |
| Route | Struct Route | The route to be printed |
| Shipment | Struct Shipment | The shipment associated with the rouse |
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**Returns:** void – this function does not return a value.

**Description:** This function prints the details of the given route along with the shipment information. It is used for debugging and verification purposes to ensure the routes are correctly identified and displayed.

**Function Name:** isBuildingIntersected

**Parameter List:**

|  |  |  |
| --- | --- | --- |
| Parameter Name | Type | Description |
| Route | Const struct Route | The route to be checked |
| Map | Const struct Map\* | The map containing the building information |
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**Returns:** Returns 1 if the route intersects with any building, otherwise returns 0.

**Description:** This function checks if the given route intersects with any buildings on the map. It ensures that the truck's path does not collide with any structures, maintaining safety and legality.

**Function Name:** getBestRoute

**Parameter List:**

|  |  |  |
| --- | --- | --- |
| Parameter Name | Type | Description |
| Routes | Struct Route\* routes[MAX\_ROUTE] | Array of possible routes |
| Shipment | Struct shipment | The shipment to be delivered |
| Size | Int | The number of possible routes |
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**Returns:** Returns the index of the best route for the shipment.

**Description:** This function selects the best route from an array of possible routes based on certain criteria such as distance, time, and safety. It helps in optimizing the delivery process by choosing the most efficient path.

**Function Name:** isTruckOverloaded

**Parameter List:**

|  |  |  |
| --- | --- | --- |
| Parameter Name | Type | Description |
| Truck | Struct Truck | The truck to be checked |
| Ship | Struct Shipment | The shipment to be added |
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**Returns:** Returns 1 if the truck is overloaded with shipment, otherwise returns 0.

**Description:** This function checks if adding the shipment to the truck will cause it to be overloaded. It ensures that the truck's weight capacity is not exceeded, maintaining safety and compliance with regulations.

**Function Name:** isBoxSizeExceeded

**Parameter List:**

|  |  |  |
| --- | --- | --- |
| Parameter Name | Type | Description |
| Truck | Struct Truck | The truck to be checked |
| boxSize | Float | The size of the box to be added |
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**Returns:** Returns 1 if the box size exceeds the truck’s capacity, otherwise returns 0.

**Description:** This function checks if the size of a box exceeds the truck's carrying capacity. It ensures that the truck can physically accommodate the box, preventing overloading and potential damage.

**Function Name:** validCargo

**Parameter List:**

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| --- | --- | --- |
| Parameter Name | Type | Description |
| boxSize | Float | The size of the cargo box |
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**Returns:** int – returns 1 if the cargo size is valid, otherwise returns 0.

**Description:** This function checks if the cargo size is within valid limits. It helps in verifying that the cargo can be transported without issues, maintaining compliance with size regulations.