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WHITEbox testing

SFT244 Group5

# Test Description

**Test Name or ID**: T01-T03 Valid Truck Selection

**Test Type**: White Box

**Description**: Verify that the function correctly finds the best truck for a shipment based on weight, size, and distance.

**Setup:** Initialize a map, trucks array, and a shipment with specified weight, box size, and destination.

**Test Function**: findTruckForShipment

**Test Scenarios:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Description | Test Data | Expected Result | Actual Result | Pass/Fail |
| Valid truck for the shipment | trucks[0].weight=1000, trucks[0].size=40, shipment.weight=400, shipment.boxSize=10 | Best truck index should be 0, as it meets weight, size, and distance criteria | 0 | Pass |
| Multiple valid trucks, select the closest | trucks[0].weight=1000, trucks[0].size=30, shipment.weight=300, shipment.boxSize=5 | Best truck index should be the one with the shortest distance among valid trucks | Returned index matched with the shortest distance truck (0 in this case) | Pass |
| No valid truck available | trucks[0].weight=1500, trucks[0].size=48, shipment.weight=100, shipment.boxSize=2 | No truck should be selected (-1 as the best truck index) | -1 | Pass |

**Test Name or ID**: T04-T08 Valid Size Addition

**Test Type**: White Box

**Description**: Testing whether the “IsValidSize4Truck” function correctly validates the addition of box sizes to a truck's cargo volume.

**Setup:** Initialize a truck with specified cargo size.

**Test Function**: IsValidSize4Truck

**Test Scenarios:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Description | Test Data | Expected Result | Actual Result | Pass/Fail |
| Valid size addition to the truck | truck.size=40, size=8 | Returns 1 (True) | Returns 1 | Pass |
| Size addition equal to the truck's limit | truck.size=47, size=1 | Returns 1 (True) | Returns 1 | Pass |
| Size addition exceeding the truck's limit | truck.size=47, size=2 | Returns 0 (False) | Returns 0 | Pass |
| Size addition equal to the maximum limit | truck.size=48, size=1 | Returns 0 (False) | Returns 0 | Pass |
| Size addition exceeding the maximum limit | truck.size=48, size=2 | Returns 0 (False) | Returns 0 | Pass |

**Test Name or ID**: T09-T13 Valid Weight Addition

**Test Type**: White Box

**Description**: Testing whether the “IsValidWeight4Truck” function correctly validates the addition of weights to a truck's cargo weight.

**Setup:** Initialize a truck with specified cargo size.

**Test Function**: IsValidWeight4Truck

**Test Scenarios:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Description | Test Data | Expected Result | Actual Result | Pass/Fail |
| Valid weight addition to the truck | truck.weight=1000, weight=200 | Returns 1 (True) | Returns 1 | Pass |
| Weight addition equal to the truck's limit | truck.weight=1400, weight=100 | Returns 1 (True) | Returns 1 | Pass |
| Weight addition exceeding the truck's limit | truck.weight=1400, weight=200 | Returns 0 (False) | Returns 0 | Pass |
| Weight addition equal to the maximum limit | truck.weight=1499, weight=1 | Returns 1 (True) | Returns 1 | Pass |
| Weight addition exceeding the maximum limit | truck.weight=1500, weight=100 | Returns 0 (False) | Returns 0 | Pass |

**Test Name or ID**: T14-T15 Valid Box Size

**Test Type**: White Box

**Description**: Testing whether the “IsValidSize” function correctly identifies standard box sizes.

**Setup:** No specific setup required.

**Test Function**: IsValidSize

**Test Scenarios:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Description | Test Data | Expected Result | Actual Result | Pass/Fail |
| Valid standard box size | size=1 | Returns 0 (False) | Returns 0 | Pass |
| Invalid non-standard box size | size=0.75 | Returns 1 (True) | Returns 1 | Pass |

**Test Name or ID**: T16-T19 Valid Truck Fullness Check

**Test Type**: White Box

**Description**: Testing whether the “IsTruckFull” function correctly identifies whether a truck is full based on weight and size limits.

**Setup:** Initialize a truck with specified cargo weight and size.

**Test Function**: IsTruckFull

**Test Scenarios:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Description | Test Data | Expected Result | Actual Result | Pass/Fail |
| Truck not full | truck.weight=1000, size=40 | Returns 0 (False) | Returns 0 | Pass |
| Truck full due to weight exceeding limit | truck.weight=1500, size=40 | Returns 1 (True) | Returns 1 | Pass |
| Truck full due to size exceeding limit | truck.weight=1000, size=48 | Returns 1 (True) | Returns 1 | Pass |
| Truck full due to both weight and size | truck.weight=1500, size=48 | Returns 1 (True) | Returns 1 | Pass |