# Test Description

**Test Name or ID**: BlackBoxUnit-listShortestDiversion

**Test Type**: Black box

**Description**: Ensure the “listShortestDiversion” function correctly displays all the points of the diversion path from the route to the destination. This helps ensure the correctness and reliability of the function, allowing users to view and assess the diversion path effectively.

**Setup:** Provide the following parameters

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| --- | --- | --- |
| Parameter | Member Variables | Description |
| const struct Route\* diversion | struct Point points[MAX\_ROUTE]; | an array of “points” of the diversion path. The “point” variable itself is also a struct which has 2 member variables, “char row” and “char col” to denote the row number and column number of a point respectively. |
| int numPoints; | the number of points of the diversion path |
| char routeSymbol; | the symbol of the relevant route |

**Test Function**:

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| --- | --- |
| Name | Description |
| listShortestDiversion | This function takes an input parameter “diversion” and prints all the points of the diversion path. It should loop through all the “points” values and call “convertPointToStr” function for each of them, which will convert each “points” object to strings, and then be printed out to the screen. |

**Test Scenarios:**

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| --- | --- | --- | --- | --- |
| Description | Test Data | Expected Result | Actual Result | Pass/Fail |
| valid diversion where the route symbol is a letter | * points: [{row: 1, col: 2}, {row: 2, col: 2}, {row: 2, col: 3}] * numPoints: 3 * routeSymbol: 'A' | Points with letter symbol printed |  |  |
| diversion is NULL | NULL | Error |  |  |
| empty diversion path | * points: [], * numPoints: 0 * routeSymbol: ' ' | No points printed |  |  |
| diversion path containing one point | * points: [{5,5}] * numPoints: 1 * routeSymbol: 'A' | One point printed |  |  |
| route symbol is a number | * points: [{1, 2}, {2, 2}, {2, 3}] * numPoints: 3 * routeSymbol: '1' | Points with number printed |  |  |
| route symbol is an empty character | * points: [{1, 2}, {2, 2}, {2, 3}] * numPoints: 3 * routeSymbol: ' ' | Points with empty symbol printed |  |  |
| route symbol is a special character | * points: [{1, 2}, {2, 2}, {2, 3}] * numPoints: 3 * routeSymbol: '@' | Points with special character symbol printed |  |  |
| diversion path where the route symbol is '\0' | * points: [{1, 2}, {2, 2}, {2, 3}] * numPoints: 3 * routeSymbol: '\0' | Error |  |  |
| diversion path where the route symbol is '\n' | * points: [{1, 2}, {2, 2}, {2, 3}] * numPoints: 3 * routeSymbol: '\n' | Error |  |  |
| diversion path where the route symbol is '\t' | * points: [{1, 2}, {2, 2}, {2, 3}] * numPoints: 3 * routeSymbol: '\t' | Error |  |  |
| diversion path that has the [MAX\_ROUTE-1] number of points | * points: [{1, 2}, {2, 2}, {2, 3}… MAX\_ROUTE-1] * numPoints: MAX\_ROUTE-1 * routeSymbol: 'A' | All points printed |  |  |
| Test with a diversion path that has the [MAX\_ROUTE] number of points | * points: [{1, 2}, {2, 2}, {2, 3}… MAX\_ROUTE] * numPoints: MAX\_ROUTE * routeSymbol: 'A' | All points printed |  |  |
| Test with a diversion path that has the [MAX\_ROUTE+1] number of points | * points: [{1, 2}, {2, 2}, {2, 3}… MAX\_ROUTE+1] * numPoints: MAX\_ROUTE+1   routeSymbol: 'A' | Error |  |  |
| diversion path containing duplicate points | * points: [{1, 2}, {1, 2}, {2, 2}] * numPoints: 3 * routeSymbol: 'A' | Error |  |  |
| diversion path where the points are randomly scattered | * points: [{1, 2}, {12, 12}, {22, 23}] * numPoints: 3 * routeSymbol: 'A' | Error |  |  |
| diversion path where all points are on a straight line | * points: [{1, 1}, {1, 2}, {1, 3}] * numPoints: 3 * routeSymbol: 'A' | All points printed |  |  |
| diversion path where all points are on a curved line | * points: [{1, 1}, {2, 2}, {3, 1}] * numPoints: 3 * routeSymbol: 'A' | All points printed |  |  |
| diversion path containing points outside the map boundaries | * points: [{-1, 1}{0, 1},{1, 1}, {2, 2}] * numPoints: 3 * routeSymbol: 'A' | Error |  |  |
| diversion path containing points on the map boundaries | * points: [{0, 1},{0, 2}, {2, 2}] * numPoints: 3 * routeSymbol: 'A' | All points printed |  |  |
| diversion path containing points on the map boundaries corner | * points: [{0, 0},{0, 1},{1, 1}, {2, 2}] * numPoints: 4 * routeSymbol: 'A' | All points printed |  |  |
| diversion path where some points are on the truck route | * points: [{2, 0}, {2, 1}, {2, 2}] * numPoints: 3 * routeSymbol: 'A' | All points printed |  |  |
| numPoints greater than the array of Point size | * points: [{2, 0}, {2, 1}, {2, 2}] * numPoints: 4 * routeSymbol: 'A' | Error |  |  |
| numPoints smaller than the array of Point size | * points: [{2, 0}, {2, 1}, {2, 2}] * numPoints: 2 * routeSymbol: 'A' | Error |  |  |

**Bugs Found**:

Description of each bug found above and how to reproduce it.