**Equivalence Test Partitioning**

Let n = the number of terms to be computed

Let x: x1…xn = a list of (n=25) numbers

Let a = the user inputted upper bound

Let b = the user inputted lower bound

*Equivalence Classes*

EC1: x1…xn consists of only floating-point numbers

EC2: b ≤ x ≤ a for all values for x

EC3: at least one value for x is < b

EC4: at least one value for x is > a

EC5: at least one value for x is an invalid data type

EC6: n = 25 (x1…x25)

EC7: n != 25

EC8: n is an invalid data type

EC9: a > b

EC10: a ≤ b

EC11: a ≤ 5000.0

EC12: a > 5000.0

EC13: a is an invalid data type

EC14: b ≥ 1.0

EC15: b < 1.0

EC16: b is an invalid data type

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| Input Condition | Valid Equivalence Classes | Invalid Equivalence Classes |
| x: x1…xn | EC1, EC2 | EC3, EC4, EC5 |
| n | EC6 | EC7, EC8 |
| a | EC9, EC11 | EC10, EC12, EC13 |
| b | EC14 | EC15, EC16 |

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| Test Case | Input Values  (default: n = 25) | Valid Equivalence Classes | Invalid Equivalence Classes |
| 1 | n = 26, x = valid array | EC1 | EC7 |
| 2 | n = 24, x = valid array | EC1 | EC7 |
| 3 | b = 20.0, an x-value is 19.9 | EC6 | EC3 |
| 4 | a = 49.9, an x-value is 50.0 | EC6 | EC4 |
| 5 | Any x-value is not a number |  | EC5 |
| 6 | a = 5000.0, b = 5000.0 | EC11(UB), EC14 | EC10 |
| 7 | a = 5000.01, b = 1.01 | EC14(ALB) | EC12(AUB) |
| 8 | a = ‘upper’, b = ‘lower’ |  | EC13, EC16 |
| 9 | a = 5000.0, b = 0.99 | EC9, EC11(UB) | EC15(BLB) |
| 10 | a = 5000.0, b = 1.0 | EC9, EC11(UB), EC14(LB) |  |
| 11 | a = 9000, b = -10 | EC9 | EC12(AUB), EC15(BLB) |
| 12 | x-values all valid, n = 25  a = 500.0, b = 160.35 | EC1, EC6, EC10, EC11  (typical) |  |

**Boundary Value Analysis**

a: a < b, a = b, a = b + 0.01, a = 5000.0, a = 5000.01

b: b = 1.0, b = 0.99

*Assumptions:*

* *x-values are all valid floating-point numbers and within boundaries*
* *n = 25 for all tests*

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| Test Case | Input Value  b (LB) | Input Value  a (UB) | Expected Output |
| 13 | 1000.00 | 999.99 | Invalid input; reprompt |
| 14 | 100.00 | 100.00 | Invalid input; reprompt |
| 15 | 1.0 | 5000.0 | Accepted (LB/UB) |
| 16 | 0.99 | 5000.01 | Invalid input (both); reprompt |
| 17 | 9.99 | 10.00 | Accepted only if  9.99 ≤ x ≤ 10.00 for all x  Reject and reprompt otherwise |
| 18 | 0.99 | 1.21 | Invalid input (BLB); reprompt |
| 19 | 6.0 | 5000.01 | Invalid input (AUB); reprompt |
| 20 | 412.37 | 1875.88 | **Accepted (typical)** |