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CMPE 187: Software Quality Engineering Team 09

Homework 2

Mutation Testing

**Test Cases**

Test Case 1: input: 2 3 2 output: value of the rank is 2

Test Case 2: input: 2 1 2 output: value of the rank is 1

Test Case 3: input: 3 3 3 output: value of the rank is 1

Test Case 4: input: 1 1 2 output: value of the rank is 3

Test Case 5: input: -1 0 1 output: value of the rank is 3

Test Case 6: input: 0 0 0 output: value of the rank is 1

Test Case 7: input: 5 1 6 output: value of the rank is 3

Test Case 8: input: -1 -1 -1 output: value of the rank is 1

Test Case 9: input: -99 -98 100 output: value of the rank is 3

Test Case 10: input: -5, -4, -3 output: value of the rank is 3

**Mutants**

Mutant 1: Change line 4 to { r = 3; -- mutant would be caught (Fails: 1, 2, 3, 6, 8)

Mutant 2: Change line 5 to for i = -1 to 3 do -- mutant would be caught (Fails: all, causes array out of bounds error)

Mutant 3: Change line 6 to if (atoi(argv[r]) < atoi(argv[i])) r = i; -- mutant would not be caught (equivalent)

Mutant 4: Change line 6 to if (atoi(argv[i]) < atoi(argv[r])) r = i; -- mutant would be caught (Fails all except test case 3, 6, 8)

Mutant 5: Change line 5 to for i = r+1 to r+2; -- mutant would not be caught (equivalent)

**Mutation Score**

3/5

**Solution**

Mutant 3 and 5 that passed are equivalent and can be discarded because there are no test cases that can be created which can catch the mutations. So the final mutation score is 100%.