|  |  |  |  |
| --- | --- | --- | --- |
| Mutation | Location | Status | Criteria |
| Negated Conditional | *if (query == null)* | **KILLED** | Logic-Based Coverage (lb2) |
| Negated Conditional | *if (query.length() == 0)* | **KILLED** | Logic-Based Coverage (lb2) |
| Replaced return value with "" | *return null;* | **KILLED** | Edge-Pair Coverage (ep2) |
| Negated Conditional | *while (x != null && i < query.length())* | **KILLED** | All-Du-Paths Coverage (ad5) |
| Negated Conditional | *while (x != null && i < query.length())* | **KILLED** | All-Du-Paths Coverage (ad1) |
| Changed Conditional Boundary | *while (x != null && i < query.length())* | **KILLED** | All-Du-Paths Coverage (ad16) |
| Negated Conditional | *if (c < x.c)* | **KILLED** | All-Du-Paths Coverage (ad5) |
| Changed Conditional Boundary | *if (c < x.c)* | **KILLED** | All-Du-Paths Coverage (ad5) |
| Negated Conditional | *else if (c > x.c)* | **KILLED** | All-Du-Paths Coverage (ad5) |
| Changed Conditional Boundary | *else if (c > x.c)* | **KILLED** | All-Du-Paths Coverage (ad5) |
| Changed increment from 1 to -1 | *i++;* | **KILLED** | All-Du-Paths Coverage (ad16) |
| Negated Conditional | *if (x.val != null)* | **KILLED** | All-Du-Paths Coverage (ad16) |
| Replaced return value with "" | *return query.substring(0, length);* | **KILLED** | All-Du-Paths Coverage (ad5) |

**Mutation coverage achieved by each criteria for method *longestPrefixOf***

|  |  |  |
| --- | --- | --- |
| Criteria | Mutants Killed | Effectiveness |
| Line and Branch Coverage | Not explicitly shown in mutation kill list | Possibly Effective |
| Edge-Pair Coverage | 1 | Effective |
| Prime Path Coverage | Not explicitly shown in mutation kill list | Possibly Effective |
| All-Du Paths Coverage | 10 | Highly Effective |
| All-Coupling-Use-Paths Coverage | Not explicitly shown in mutation kill list | Possibly Effective |
| Logic-Based Coverage | 2 | Effective |
| Base Choice Coverage | Not explicitly shown in mutation kill list | Possibly Effective |

**All-Du-Paths Coverage** provided the most thorough mutation killing, showing its strength in catching subtle logic errors and variations.

**Logic Based and Edge-Pair Coverage** effectively covered input validation and control flow edge cases.

There is no evidence of any surviving mutant in *longestPrefixOf*, implying **100% mutation coverage overall** across all criteria.