

# refined-evosuite1

## Strategy

1. Run the current test suites and obtain the coverage results
2. Record the methods with low coverage and ask LLMs to generate tests for them
3. Manually check and filter the generated tests
4. Add the checked generated tests to all the test suites

## Result Comparison

The refined tests can locate bugs in branches not covered by the original test suites. For example, `reverse` has 0 score in original tests, but is detected as a potential bug in refined tests:

Original:

```
<comp5111.assignment.cut.Subject$SortTools: int[] reverse(int[],int,int)>
$stack5 = lengthof array      0.000000      765
<comp5111.assignment.cut.Subject$SortTools: int[] reverse(int[],int,int)>      from =
from + 1      0.000000      765
<comp5111.assignment.cut.Subject$SortTools: int[] reverse(int[],int,int)>      goto
[?= staticinvoke <comp5111.assignment.Counter: void invokeStmt(java.lang.String)>("
<comp5111.assignment.cut.Subject$SortTools: int[] reverse(int[],int,int)>6")]
0.000000      765
<comp5111.assignment.cut.Subject$SortTools: int[] reverse(int[],int,int)>      if 0 >
from goto return null  0.000000      765
<comp5111.assignment.cut.Subject$SortTools: int[] reverse(int[],int,int)>      if
from > to goto return null  0.000000      765
<comp5111.assignment.cut.Subject$SortTools: int[] reverse(int[],int,int)>      if
from >= to#5 goto return array  0.000000      765
<comp5111.assignment.cut.Subject$SortTools: int[] reverse(int[],int,int)>      if to
< $stack5 goto to#5 = to + -1  0.000000      765
<comp5111.assignment.cut.Subject$SortTools: int[] reverse(int[],int,int)>      return
array  0.000000      765
<comp5111.assignment.cut.Subject$SortTools: int[] reverse(int[],int,int)>      return
null  0.000000      765
<comp5111.assignment.cut.Subject$SortTools: int[] reverse(int[],int,int)>      to#5 =
to + -1 0.000000      765
<comp5111.assignment.cut.Subject$SortTools: int[] reverse(int[],int,int)>      to#5 =
to#5 + -1      0.000000      765
<comp5111.assignment.cut.Subject$SortTools: int[] reverse(int[],int,int)>
virtualinvoke this.<comp5111.assignment.cut.Subject$SortTools: int[]
swap(int[],int,int)>(array, from, to#5) 0.000000      765
```

## Refined:

```
<comp5111.assignment.cut.Subject$SortTools: int[] reverse(int[],int,int)>      if
from >= to#5 goto return array 0.335410      33
<comp5111.assignment.cut.Subject$SortTools: int[] reverse(int[],int,int)>      return
array 0.335410      33
<comp5111.assignment.cut.Subject$SortTools: int[] reverse(int[],int,int)>      to#5 =
to + -1 0.335410      33
```

The refined tests detect three different bugs ignored by original tests, which are located in `reverse`, `lower` and `upper`.