DIT636 / DAT560 - Mutation Testing Activity

The following code iterates over an array and makes all negative values positive.

```
1. public int[] makePositive(int[] a){
2.     int threshold = 0;
3.     for(int i=0; i < a.length; i++){
4.         if(a[i] < threshold){
5.             a[i]= -a[i];
6.         }
7.     }
8.     return a;
9. }
```

1: How many lines can be mutated for each of the following operators:

- **Relational Operator Replacement**
  - **Swap one of (<,<=,>,>=,==,!=) for one of the others**
- **Constant-for-Constant Replacement**
  - **Swap a constant for another constant.**

2: Apply relational operator replacement to statement 4 of the method, and identify test input that would lead to a different outcome from the unmutated method. You do not need to create a full unit test.

3: Design an equivalent mutant that no test case can detect. You may apply any mutation operator to any one line of code.

4: Design a valid (compiles), but useless (almost all tests will lead to different results than the unmutated method) mutant. You may apply any mutation operator to any one line of code.