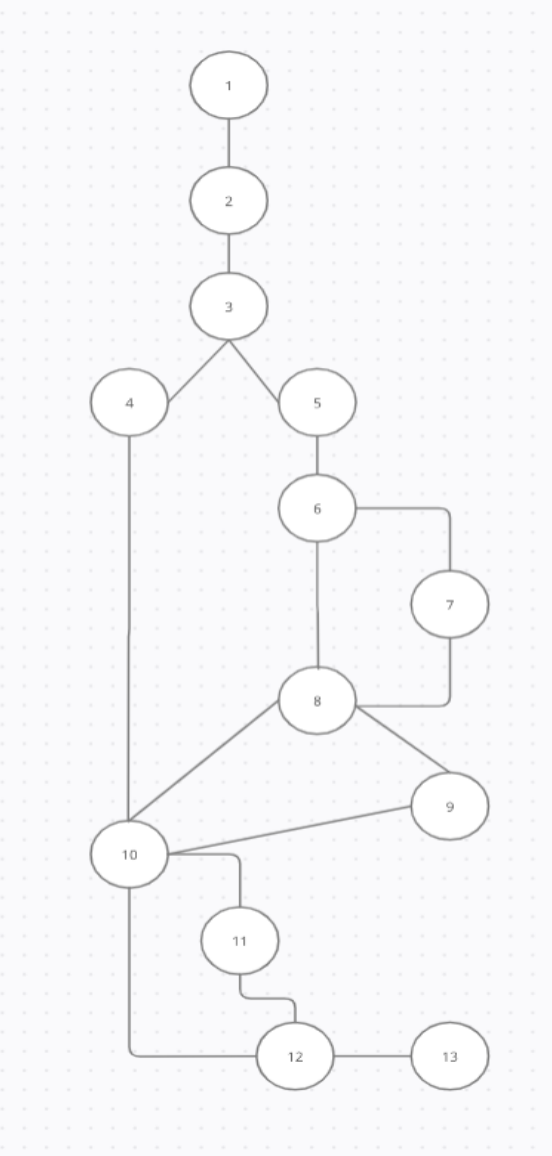
Car Insurance Scenario

Drawing the control flow graph of the code we get:



Using cyclomatic complexity on this CFG we get the following:

V(G) = Edges - Nodes + 2

V(G) = 16 - 13 +2

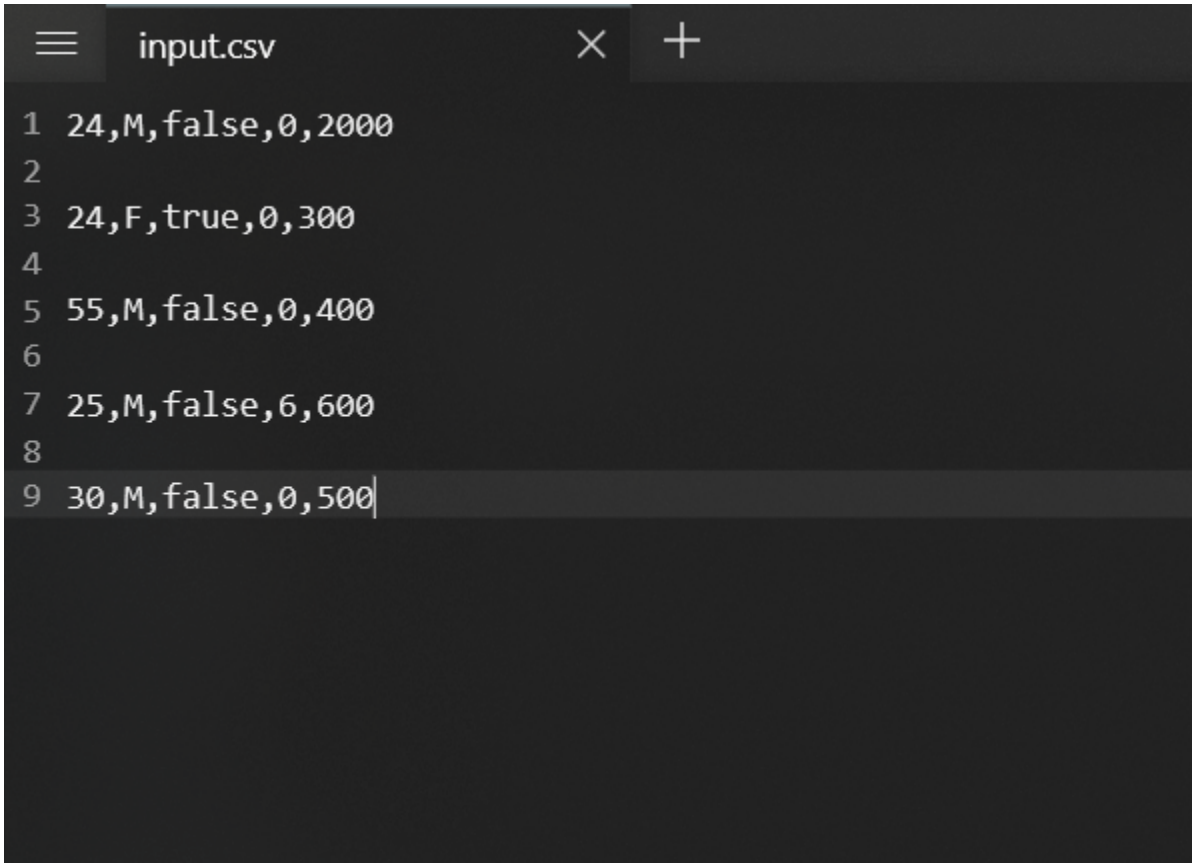
V(G) = 5

That means there are 5 linearly independent paths.

➔ 1 2 3 4 10 12 13

➔ 1 2 3 5 6 7 8 10 12 13
➔ 1 2 3 5 6 8 9 10 12 13
➔ 1 2 3 5 6 8 10 11 12 13
➔ 1 2 3 5 6 8 10 12 13

Using the following input in the csv file:



Note:

Here we use each input for each different path. So in total we need to check only for 5 possible cases. If it works for that then it'll work for all cases. These 5 cases fulfill the 5 independent paths.

For our test case file we're using:

FeatureTest.java

```java
import org.junit.jupiter.api.Assertions;
import org.junit.jupiter.params.ParameterizedTest;
import org.junit.jupiter.params.provider.CsvFileSource;

class FeatureTest {
    @ParameterizedTest
    @CsvFileSource(files = "src/test/resources/input.csv")
    void test(int age, char gender, Boolean married, int points, int expectedOutput){
        Feature f = new Feature();
        int result = f.CarInsurance(age, gender, married, points);
        Assertions.assertEquals(result, expectedOutput);
    }
}
```

Now viewing the report test we can see our input data passes.

Class FeatureTest

all > default-package > FeatureTest

5	0	0	0.037s
tests	failures	ignored	duration

100% successful

Tests

Test	Method name	Duration	Result
[1] 24, M, false, 0, 2000	test(int, char, Boolean, int, int)[1]	0.033s	passed
[2] 24, F, true, 0, 300	test(int, char, Boolean, int, int)[2]	0.001s	passed
[3] 55, M, false, 0, 400	test(int, char, Boolean, int, int)[3]	0.001s	passed
[4] 25, M, false, 6, 600	test(int, char, Boolean, int, int)[4]	0.001s	passed
[5] 30, M, false, 0, 500	test(int, char, Boolean, int, int)[5]	0.001s	passed

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Now let’s modify the input data and check for a variety of data also purposely giving wrong expected output:

Class FeatureTest

all > default-package > FeatureTest

10	1	0	0.077s
tests	failures	ignored	duration

90% successful

Failed tests | **Tests**

Test	Method name	Duration	Result
[10] 60, F, True, 0, 200	test(int, char, Boolean, int, int)[10]	0.001s	passed
[1] 24, M, false, 0, 2000	test(int, char, Boolean, int, int)[1]	0.063s	passed
[2] 24, M, false, 6, 2100	test(int, char, Boolean, int, int)[2]	0.002s	passed
[3] 23, M, false, 0, 2000	test(int, char, Boolean, int, int)[3]	0.001s	passed
[4] 22, M, false, 0, 20000	test(int, char, Boolean, int, int)[4]	0.004s	failed
[5] 25, M, false, 0, 500	test(int, char, Boolean, int, int)[5]	0.001s	passed
[6] 25, M, true, 0, 300	test(int, char, Boolean, int, int)[6]	0.002s	passed
[7] 24, F, true, 0, 300	test(int, char, Boolean, int, int)[7]	0.001s	passed
[8] 24, F, false, 0, 300	test(int, char, Boolean, int, int)[8]	0.001s	passed
[9] 55, M, True, 0, 200	test(int, char, Boolean, int, int)[9]	0.001s	passed