

Софтверски квалитет и тестирање

Домашна бр.4

Марко Манчов 151211

Дадениот код кој ќе служи за решавање на оваа вежба:

```
/**
 * @param month1
 * @param day1
 * @param month2
 * @param day2
 * @param year
 * @return the number of days between the two given days in the same year
 * preconditions: day1 and day2 must be in same year
 * 1 <= month1, month2 <= 12
 * 1 <= day1, day2 <= 31
 * month1 <= month2
 * The range for year: 1 ... 10000
 */

public class cal {
    public static int cal(int month1, int day1, int month2, int day2, int
year) {
        int numDays;
        if (month2 == month1)
            numDays = day2 - day1;
        else {
            int daysIn[] = {0, 31, 0, 31, 30, 31, 30, 31, 31, 30, 31, 30,
31};
            int m4 = year % 4;
            int m100 = year % 100;
            int m400 = year % 400;
            if ((m4 != 0) || ((m100 == 0) && (m400 != 0)))
                daysIn[2] = 28;
            else
                daysIn[2] = 29;
            numDays = day2 + (daysIn[month1] - day1);
            for (int i = month1 + 1; i <= month2 - 1; i++)
                numDays = daysIn[i] + numDays;
        }
        return (numDays);
    }
}
```

1) Да се напишат предикатите кои произлегуваат од следниот код.

- a: (month2 == month1)
- b: (m4 != 0)
- c: (m100 == 0)
- d: (m400 != 0)
- a ^ (b | (c & d))**

2) Да се испишат соодветните табели на вистинитост за предикатите.

Truth Table:

Row#	a	b	c	d	P	Pa	Pb	Pc	Pd
1	T	T	T	T		T			
2	T	T	T			T	T		
3	T	T		T		T	T		
4	T	T				T	T		
5	T		T	T		T		T	T
6	T		T		T	T	T		T
7	T			T	T	T	T	T	
8	T				T	T	T		
9		T	T	T	T	T			
10		T	T		T	T	T		
11		T		T	T	T	T		
12		T			T	T	T		
13			T	T	T	T		T	T
14			T			T	T		T
15				T		T	T	T	
16						T	T		

3) Да се најдат TR за следните покривања: CACC, RACC.

CACC

Major Clause	Set of possible tests
a	(1,9), (1,10), (1,11), (1,12), (1,13), (2,9), (2,10), (2,11), (2,12), (2,13), (3,9), (3,10), (3,11), (3,12), (3,13), (4,9), (4,10), (4,11), (4,12), (4,13), (5,9), (5,10), (5,11), (5,12), (5,13), (6,14), (6,15), (6,16), (7,14), (7,15), (7,16), (8,14), (8,15), (8,16)
b	(2,6), (2,7), (2,8), (3,6), (3,7), (3,8), (4,6), (4,7), (4,8), (10,14), (10,15), (10,16), (11,14), (11,15), (11,16), (12,14), (12,15), (12,16)
c	(5,7), (13,15)
d	(5,6), (13,14)

RACC

Major Clause	Set of possible tests
a	(1,9), (2,10), (3,11), (4,12), (5,13), (6,14), (7,15), (8,16)
b	(2,6), (3,7), (4,8), (10,14), (11,15), (12,16)
c	(5,7), (13,15)
d	(5,6), (13,14)

4) Да се најдат тест вредности (генерирајте параметризирани тестови со JUnit) кои што задоволуваат РАСС. Внимавајте да биде задоволено reachability.

```
import org.junit.jupiter.api.BeforeEach;
import org.junit.jupiter.api.Test;

import static org.junit.jupiter.api.Assertions.assertEquals;

class calTest {
    int month1;
    int day1;
    int month2;
    int day2;
    int year;
    Cal calcul;
    @BeforeEach
    public void setUp() {
        calcul = new Cal();
    }

    @Test
    public void test1() {
        month1 = 1;
        day1 = 1;
        month2 = 1;
        day2 = 1;
        year = 1;
        // 1 : T T T T
        assertEquals(0,
            calcul.cal(month1, day1, month2, day2, year));
    }

    @Test
    public void test2() {
        month1 = 1;
        day1 = 1;
        month2 = 2;
        day2 = 1;
        year = 1;
        // 9 : F T T T
        assertEquals(31,
            calcul.cal(month1, day1, month2, day2, year));
    }

    @Test
    public void test3() {
        month1 = 1;
        day1 = 1;
        month2 = 2;
        day2 = 1;
        year = 400;
        // 10 : F T T F
        assertEquals(31,
            calcul.cal(month1, day1, month2, day2, year));
    }
}
```

```

@Test
public void test4() {
    month1 = 1;
    day1 = 1;
    month2 = 2;
    day2 = 1;
    year = 404;
    // 14 : F F T F
    assertEquals(31,
        calcul.cal(month1,day1, month2, day2,year));
}
@Test
public void test5() {
    month1 = 1;
    day1 = 1;
    month2 = 2;
    day2 = 1;
    year = 500;
    // 13 : F F T T
    assertEquals(31,
        calcul.cal(month1,day1, month2, day2,year));
}
@Test
public void test6() {
    month1 = 1;
    day1 = 1;
    month2 = 2;
    day2 = 1;
    year = 505;
    // 15 : F F F T
    assertEquals(31,
        calcul.cal(month1,day1, month2, day2,year));
}
}

```

Major Clause	Set of tests
a	(1,9)
b	(10,14)
c	(13,15)
d	(13,14)