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Assignment: 02

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1. Problem Statement:

Your task is to create a simple rectangle class with a few functions in the class. The function `isRectangle` which takes 4 parameters and tell us whether given parameter form a rectangle or not. The parameters should be in range (1-30).

The function `areaOfRectangle` which takes 2 parameters and tell us area of rectangle. The parameters should be in range (1-30).

The function `perimeterOfRectangle` which takes 2 parameters and tell us perimeter of rectangle. The parameters should be in range (1-30).

Void `isRectangle (int width1, int height1, int width2, int height2)`

Void `areaOfRectangle(int a,int b) width*height`

Void `perimeterOfRectangle(int a,int b) 2*(width+height)`

2. Boundary Value Analysis:

For `isRectangle` Function:

BVA for variable a: 1,2,15,29,30

BVA for variable b: 1,2,15,29,30

BVA for variable c: 1,2,15,29,30

BVA for variable d: 1,2,15,29,30

Test Cases for Worst Boundary Value Analysis: False

Case	Width1	Height1	Width2	Height2	Result
1	1	1	1	1	False
2	1	1	1	2	False
3	1	1	1	15	False
4	1	1	1	29	False
5	1	1	1	30	False
6	1	1	2	1	False
7	1	1	2	2	False
8	1	1	2	15	False
9	1	1	2	29	False
10	1	1	2	30	False
11	1	1	15	1	False
12	1	1	15	2	False
13	1	1	15	15	False
14	1	1	15	29	False

15	1	1	15	30	False
16	1	1	29	1	False
17	1	1	29	2	False
18	1	1	29	15	False
19	1	1	29	29	False
20	1	1	29	30	False
21	1	1	30	1	False
22	11	1	30	2	False
23	1	1	30	15	False
24	1	1	30	29	False
25	1	1	30	30	False
26	1	2	1	1	False
27	1	2	1	2	True
28	1	2	1	15	False
29	1	2	1	29	False
30	1	2	1	30	False
31	1	2	2	1	False
32	1	2	2	2	False
33	1	2	2	15	False
34	1	2	2	29	False
35	1	2	2	30	False
36	1	2	15	1	False
37	1	2	15	2	False
38	1	2	15	15	False
39	1	2	15	29	False
40	1	2	15	30	False
41	1	2	29	1	False
42	1	2	29	2	False
43	1	2	29	15	False
44	1	2	29	29	False
45	1	2	29	30	False
46	1	2	30	1	False
47	1	2	30	2	False
48	1	2	30	15	False
49	1	2	30	29	False
50	1	2	30	30	False
51	1	15	1	1	False
52	1	15	1	2	False
53	1	15	1	15	True
54	1	15	1	29	False
55	1	15	1	20	False
56	1	15	2	1	False
57	1	15	2	2	False
58	1	15	2	15	False
59	1	15	2	29	False
60	1	15	2	30	False

61	1	29	1	29	True
62	1	15	1	15	True

For areaofRectangle Function:

BVA for width: 1,2,15,29,30

BVA for height: 1,2,15,29,30

Test Cases:

Case	Width	Height
1	1	1
2	1	2
3	1	15
4	1	29
5	1	30
6	2	1
7	2	2
8	2	15
9	2	29
10	2	30
11	15	1
12	15	2
13	15	15
14	15	29
15	15	20
16	29	1
17	29	2
18	29	15
19	29	29
20	29	30
21	30	1
22	30	2
23	30	15
24	30	29
25	30	30

For PerimeterofRectangle Function:

BVA for width: 1,2,15,29,30

BVA for height: 1,2,15,29,30

Test Cases:

Case	Width	Height
1	1	1
2	1	2
3	1	15
4	1	29
5	1	30
6	2	1
7	2	2
8	2	15
9	2	29
10	2	30
11	15	1
12	15	2
13	15	15
14	15	29
15	15	20
16	29	1
17	29	2
18	29	15
19	29	29
20	29	30
21	30	1
22	30	2
23	30	15
24	30	29
25	30	30

3. Robust Equivalence Class Portioning and Comparison with Worst BVA:

3.1 For isRectangle Function:

For robust width1 we get

Width1<1

1<=width1<=30

width1>30

We can pick

0

20

40

For robust height we get

Height1<1

1<=height1<=30

height1>30

We can pick

0

20

40

For robust width1 we get

Width2<1

1<=width2<=30

width2>30

We can pick

0

20

40

For robust height we get

Height2<1

1<=height2<=30

height2>30

We can pick

0

20

40

Case	Width1	Height1	Width2	Height2
1	0	0	0	0
2	0	0	0	20
3	0	0	0	40
4	0	0	20	0
5	0	0	20	20
6	0	0	20	40
7	0	0	40	0
8	0	0	40	20
9	0	0	40	40
10	0	20	0	0
11	0	20	0	20
12	0	20	0	40
13	0	20	20	0
14	0	20	20	20
15	0	20	20	40
16	0	20	40	0
17	0	20	40	20
18	0	20	40	40
19	0	40	0	0
20	0	40	0	20
21	0	40	0	40
22	0	40	20	0
23	0	40	20	20
24	0	40	20	40
25	0	40	40	0
26	0	40	40	20
27	0	40	40	40
28	20	0	0	0
29	20	0	0	20

30	20	0	0	40
31	20	0	20	0
32	20	0	20	20
33	20	0	20	40
34	20	0	40	0
35	20	0	40	20
36	20	0	40	40
37	20	20	0	0
38	20	20	0	20
39	20	20	0	40
40	20	20	20	0
41	20	20	20	20
42	20	20	20	40
43	20	20	40	0
44	20	20	40	20
45	20	20	40	40
46	20	40	0	0
47	20	40	0	20
48	20	40	0	40
49	20	40	20	0
50	20	40	20	20
51	20	40	20	40
52	20	40	40	0
53	20	40	40	20
54	20	40	40	40
55	40	0	0	0
56	40	0	0	20
57	40	0	0	40
58	40	0	20	0
59	40	0	20	20
60	40	0	20	40
61	40	0	40	0
62	40	0	40	20
63	40	0	40	40
64	40	20	0	0
65	40	20	0	20
66	40	20	0	40
67	40	20	20	0
68	40	20	20	20
69	40	20	20	40
70	40	20	40	0
71	40	20	40	20
72	40	20	40	40
73	40	40	0	0
74	40	40	0	20
75	40	40	0	40

76	40	40	20	0
77	40	40	20	20
78	40	40	20	40
79	40	40	40	0
80	40	40	40	20
81	40	40	40	40

Total Number of tests=81

Test in BVA=625

By using Equivalence Partitioning we have reduced =544

3.2 For areaOfRectangle Function:

Valid range for width= 0-30 we can pick 20

Valid range for height=0-32 we can pick 25

For robust width we get

Width<1

1<=width<=30

width>30

We can pick

0

20

40

For robust height we get

height<1

1<=height<=30

height>30

We can pick

0

20

40

Case	Width	Height
1	0	0
2	0	20
3	0	40
4	20	0
5	20	20
6	20	40
7	40	0
8	40	20
9	40	40

Number of Test Cases using Strong Robust Equivalence Portioning=9

Number of Test Cases using Weak BVA = 25

By using Equivalence Portioning we don only 9 tests instead of 25 using BVA. By equivalence we are saved from conducting 16 test.

Number of lest test cases from BVA = 16

3.3 For perimeterOfRectangle Function:

Valid range for width= 0-30 we can pick 20

Valid range for height=0-32 we can pick 25

For robust wifth we get

Width<1	1<=width<=30	width>30
We can pick		
0	20	40

For robust height we get

height<1	1<=height<=30	height>30
We can pick		
0	20	40

Case	Width	Height
1	0	0
2	0	20
3	0	40
4	20	0
5	20	20
6	20	40
7	40	0
8	40	20
9	40	40

Number of Test Cases using Strong Robust Equivalence Portioning=9

Number of Test Cases using Weak BVA = 25

By using Equivalence Portioning we don only 9 tests instead of 25 using BVA. By equivalence we are saved from conducting 16 test.

Number of lest test cases from BVA = 16
