Practical No. 2

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Aim: Write a program in C/C++ to find the area of a circle, triangle, square and rectangle and perform equivalence class testing.

Theory:

- What is an equivalence class?

→ An equivalence class or equivalence partitioning is a set of test cases that tests the same thing or reveals the same bug.

In equivalence class testing, we find two types of equivalence classes:

i) Input domain
ii) Output domain

Input domain is formed from one valid and two invalid sequences.

The Output domain is obtained from different types of output of the problem.

- Equivalence partitioning is a type of black box testing.

- Equivalence partitioning/class testing is the process of methodically reducing the huge (infinite) set of possibilities of test cases into a much smaller, but still equally effective state.

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Equivalence class testing :

1. Triangle

Input Domain

$I_1 = \{ h : h <= 0 \}$

$I_2 = \{ h : 1 <= h <= 200 \}$

$I_3 = \{ h : h > 200 \}$

$I_4 = \{ b : b <= 0 \}$

$I_5 = \{ b : 1 <= h <= 200 \}$

$I_6 = \{ b : b > 200 \}$

Output Domain

O_1 : { Triangle if $h > 0, b > 0$ }

O_2 : { Not a Triangle if $h <= 0, b <= 0$ }

Test Case Id	h	b	Expected Output	Output
1	0	100	Invalid Input	Invalid Input
2	100	100	~~10000~~ 5000	5000
3	201	100	Invalid Input	Invalid Input
4	100	0	Invalid Input	Invalid Input
5	100	50	~~5000~~ 2500	2500
6	100	201	Invalid Input	Invalid Input

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2. Circle :

Input Domain :

$I_1 = \{ r : r <= 0 \}$
$I_2 = \{ r : 1 <= r <= 200 \}$
$I_3 = \{ r : r > 200 \}$

Output Domain :

$O_1 = \{$ Circle if $1 <= r <= 200 \}$
$O_2 = \{$ Not a circle if $r <= 0 \}$

Test Case Id	radius (r)	Expected Output	Actual Output
1	0	Invalid output	Invalid Output
2	100	31400	31400
3	201	Invalid Output	Invalid Output

3. Rectangle :

Input Domain

$I_1 : \{ l : l <= 0 \}$
$I_2 : \{ l : 1 <= l <= 200 \}$
$I_3 : \{ l : l >= 201 \}$

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I_4 = { I_4 : b : $b <= 0$ }

I_5 = { I_5 : b : $1 <= b <= 200$ }

I_6 = { I_6 : b : $b >= 201$ }

Output Domain :

O_1 = { : Rectangle if $l > 0$, $b > 0$ }

O_2 = { : Not a rectangle if $l <= 0$, $b <= 0$ }

Test Case Id	l	b	Expected Outcome	Actual Outcome
1	0	100	Invalid input	Invalid Input
2	100	100	10000	10000
3	201	100	Invalid input	Invalid Input
4	100	0	Invalid input	Invalid Input
5	100	100	10000	10000
6	100	201	Invalid Input	Invalid Input

4. Square :

Input Domain :

I_1 = { s : $s <= 0$ }

I_2 = { s : $1 <= s <= 200$ }

I_3 = { s : $s >= 201$ }

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Output Domain :

O_1

O_1 = { : Square , if $s > 0$ }

O_2 = { : Not a Square, if $s <= 0$ }

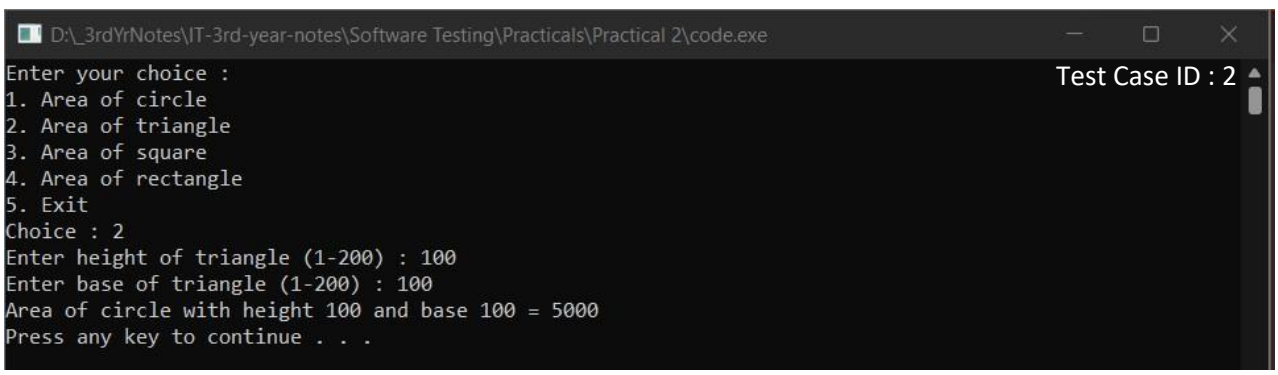
Test Case Id	Side (s)	Expected Output	Actual Output
1	0	Invalid Input	Invalid Input
2	100	10000	10,000
3	201	Invalid Input	Invalid Input

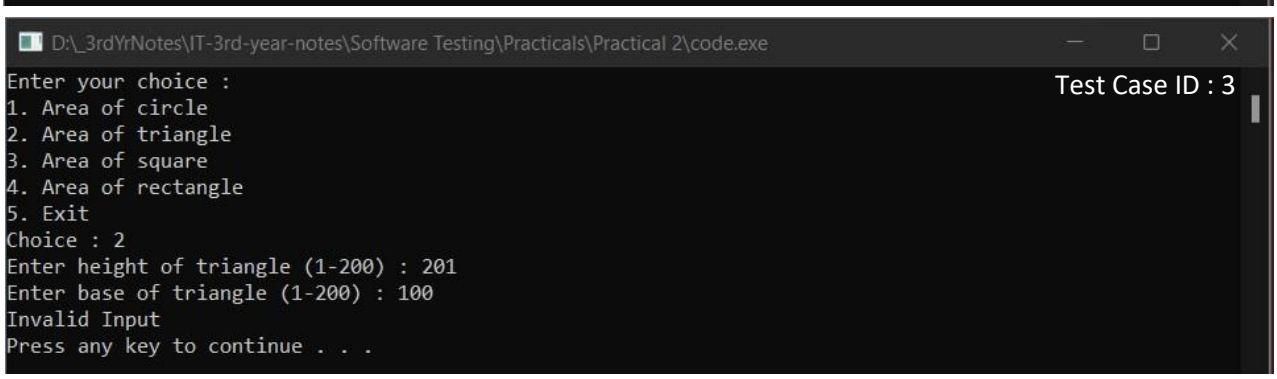
Conclusion :

Hence, I have executed and studied a program, written in C++, to find the area of a circle, triangle, square and rectangle and performed equivalence class testing with sample test cases.

Triangle :


D:_3rdYrNotes\IT-3rd-year-notes\Software Testing\Practicals\Practical 2\code.exe
Enter your choice :
1. Area of circle
2. Area of triangle
3. Area of square
4. Area of rectangle
5. Exit
Choice : 2
Enter height of triangle (1-200) : 0
Enter base of triangle (1-200) : 100
Invalid Input
Press any key to continue . . .
Test Case ID : 1


D:_3rdYrNotes\IT-3rd-year-notes\Software Testing\Practicals\Practical 2\code.exe
Enter your choice :
1. Area of circle
2. Area of triangle
3. Area of square
4. Area of rectangle
5. Exit
Choice : 2
Enter height of triangle (1-200) : 100
Enter base of triangle (1-200) : 100
Area of circle with height 100 and base 100 = 5000
Press any key to continue . . .
Test Case ID : 2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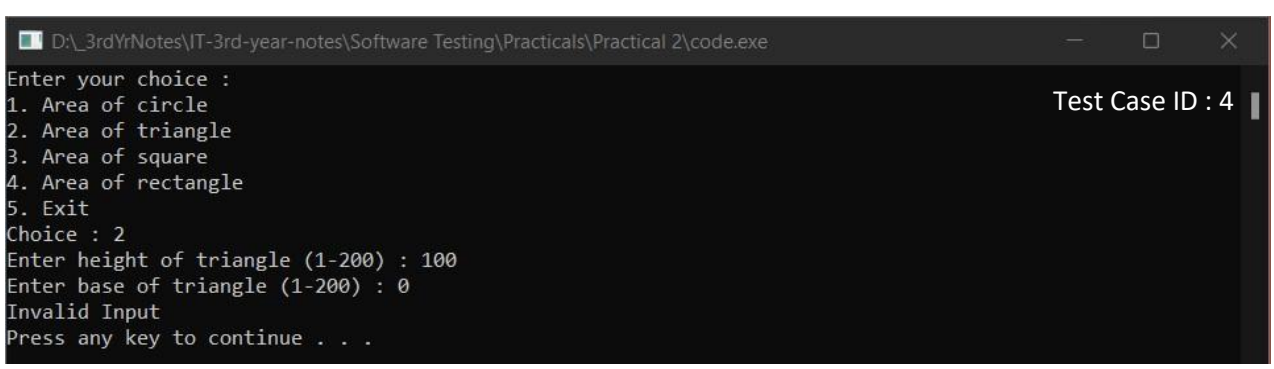
Enter your choice :
1. Area of circle
2. Area of triangle
3. Area of square
4. Area of rectangle
5. Exit
Choice : 2
Enter height of triangle (1-200) : 201
Enter base of triangle (1-200) : 100
Invalid Input
Press any key to continue . . .
Test Case ID : 3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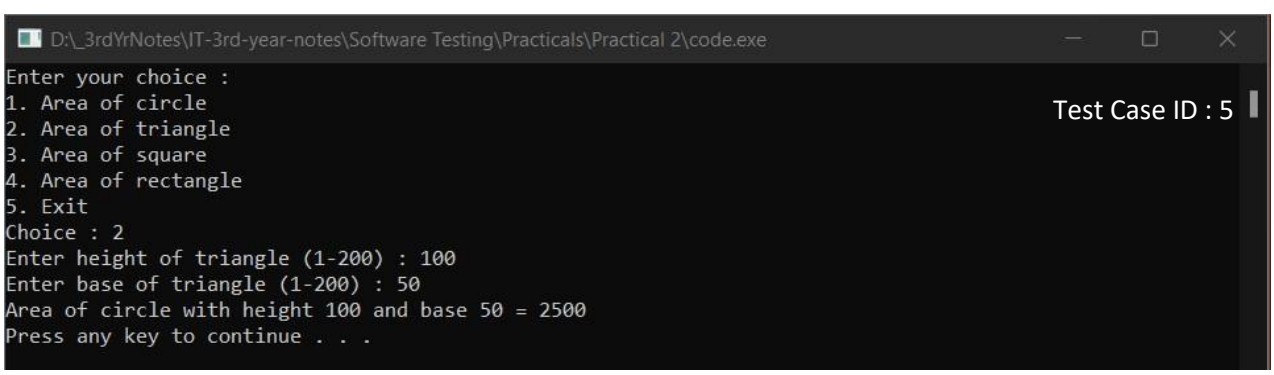
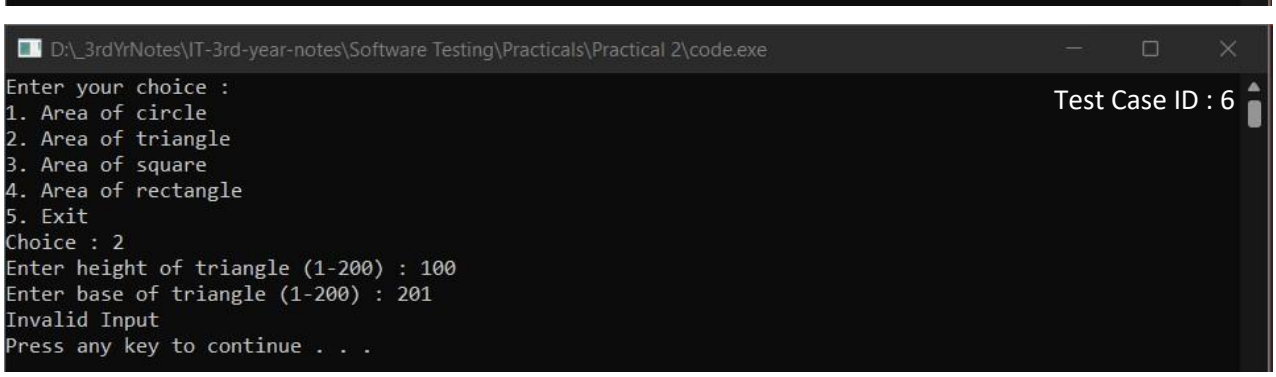
Enter your choice :
1. Area of circle
2. Area of triangle
3. Area of square
4. Area of rectangle
5. Exit
Choice : 2
Enter height of triangle (1-200) : 100
Enter base of triangle (1-200) : 0
Invalid Input
Press any key to continue . . .
Test Case ID : 4


D:_3rdYrNotes\IT-3rd-year-notes\Software Testing\Practicals\Practical 2\code.exe
Enter your choice :
1. Area of circle
2. Area of triangle
3. Area of square
4. Area of rectangle
5. Exit
Choice : 2
Enter height of triangle (1-200) : 100
Enter base of triangle (1-200) : 50
Area of circle with height 100 and base 50 = 2500
Press any key to continue . . .
Test Case ID : 5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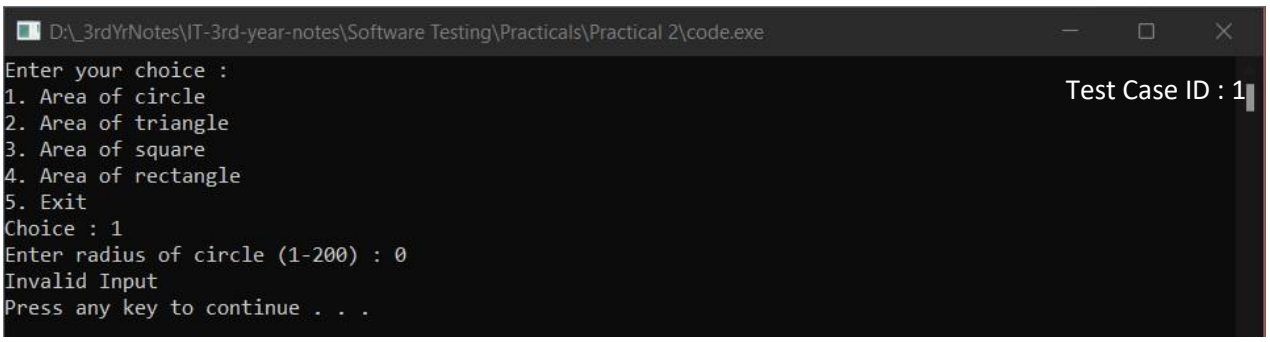
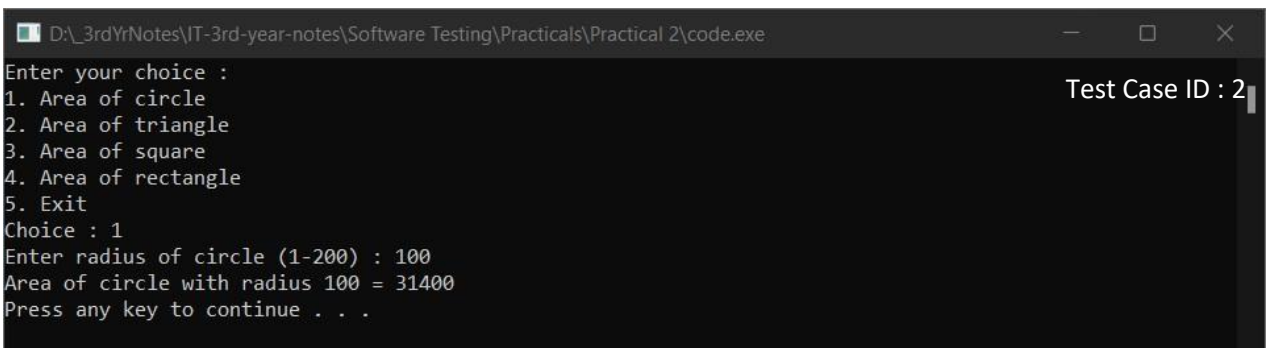
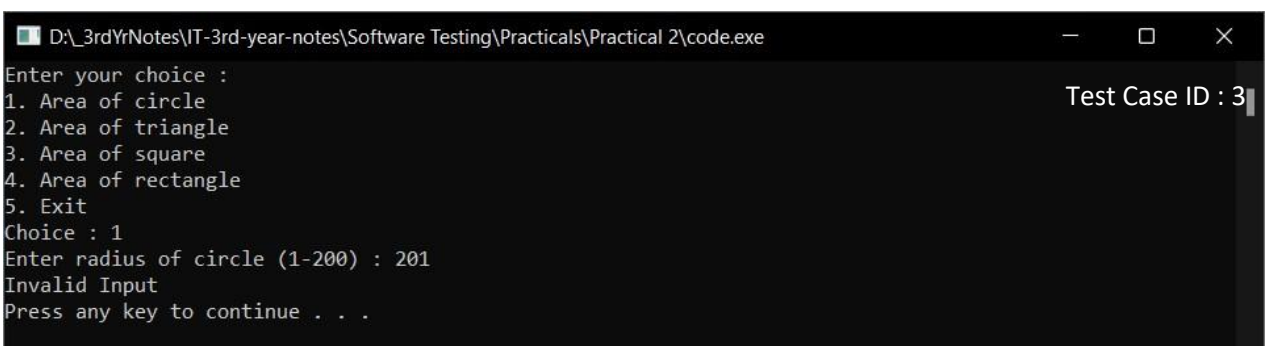
Enter your choice :
1. Area of circle
2. Area of triangle
3. Area of square
4. Area of rectangle
5. Exit
Choice : 2
Enter height of triangle (1-200) : 100
Enter base of triangle (1-200) : 201
Invalid Input
Press any key to continue . . .
Test Case ID : 6

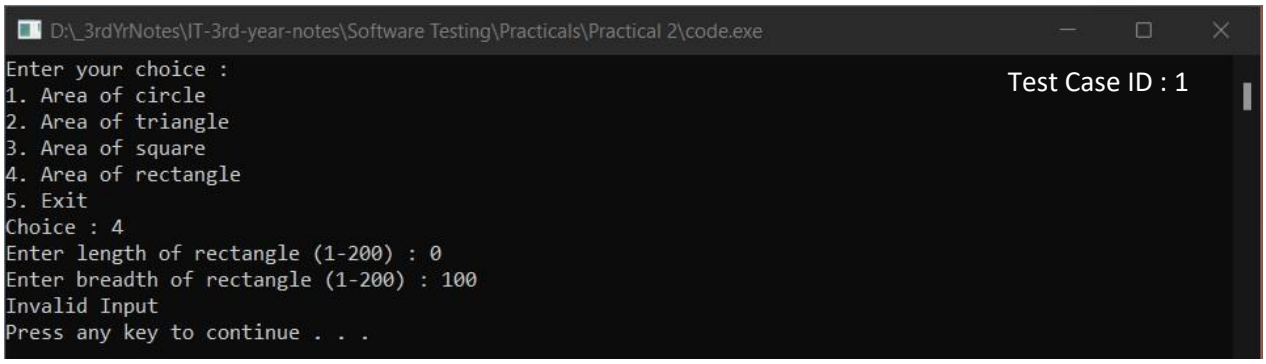
Circle :

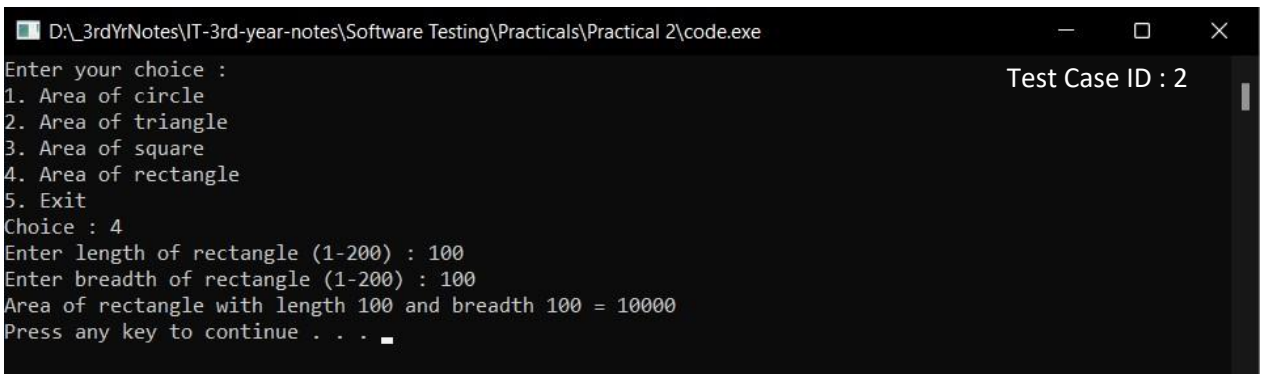






Rectangle :


D:_3rdYrNotes\IT-3rd-year-notes\Software Testing\Practicals\Practical 2\code.exe
Enter your choice :
1. Area of circle
2. Area of triangle
3. Area of square
4. Area of rectangle
5. Exit
Choice : 4
Enter length of rectangle (1-200) : 0
Enter breadth of rectangle (1-200) : 100
Invalid Input
Press any key to continue . . .
Test Case ID : 1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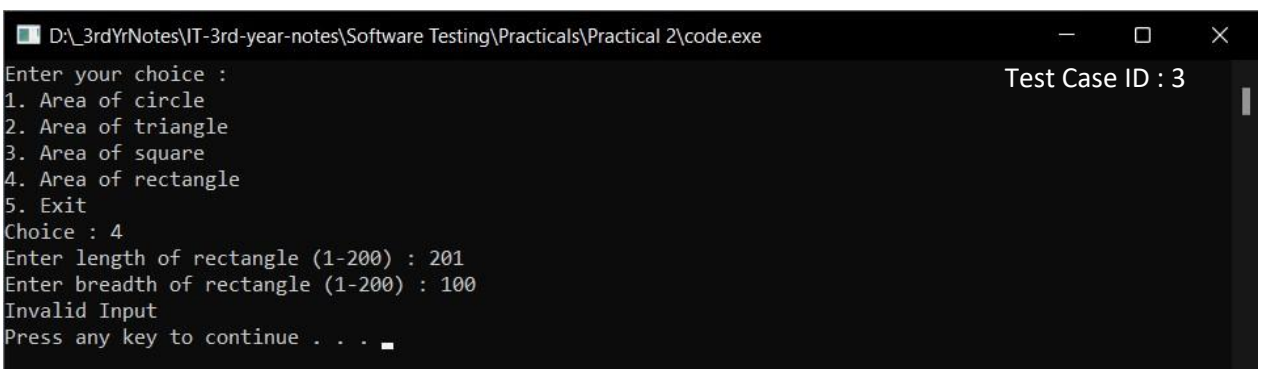
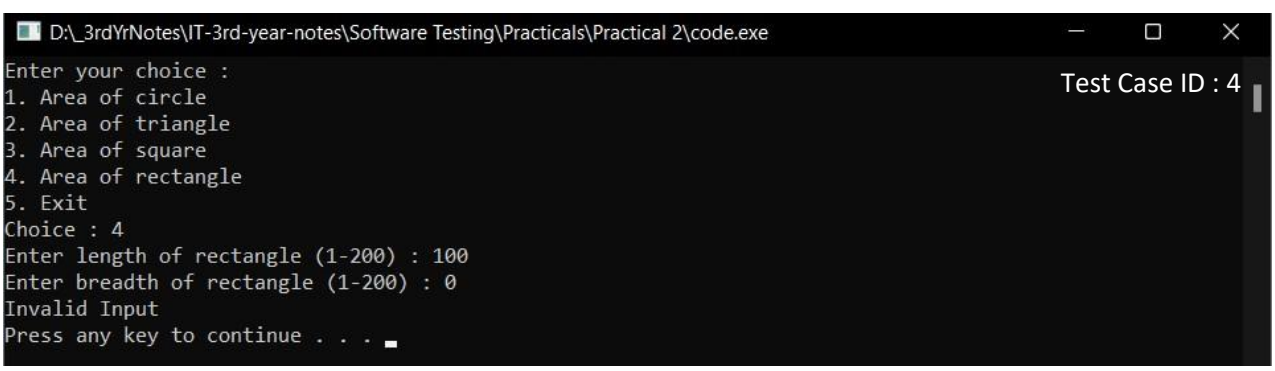
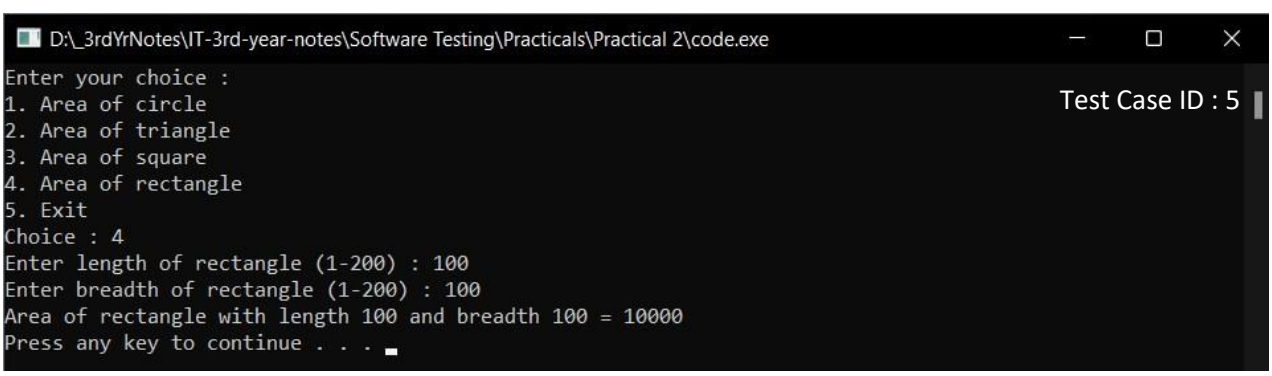
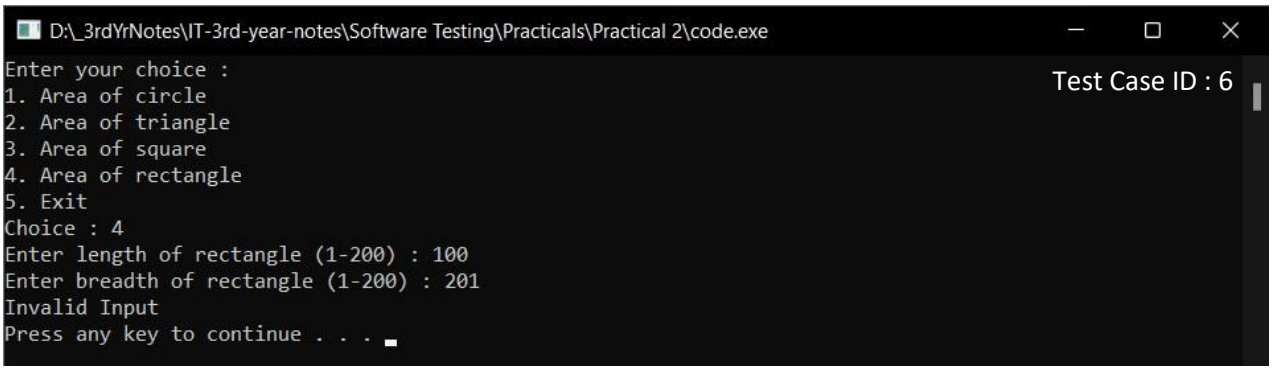
Enter your choice :
1. Area of circle
2. Area of triangle
3. Area of square
4. Area of rectangle
5. Exit
Choice : 4
Enter length of rectangle (1-200) : 100
Enter breadth of rectangle (1-200) : 100
Area of rectangle with length 100 and breadth 100 = 10000
Press any key to continue . . .
Test Case ID : 2

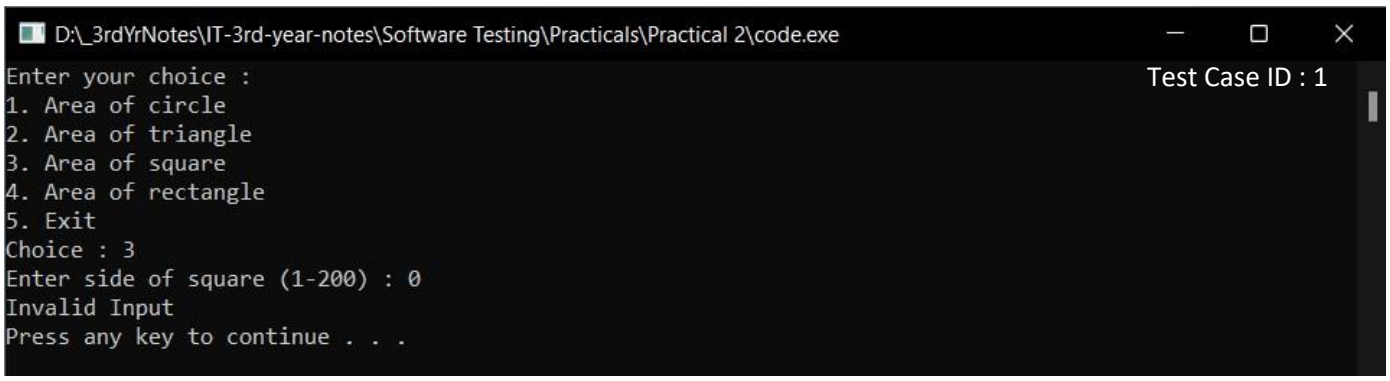

D:_3rdYrNotes\IT-3rd-year-notes\Software Testing\Practicals\Practical 2\code.exe
Enter your choice :
1. Area of circle
2. Area of triangle
3. Area of square
4. Area of rectangle
5. Exit
Choice : 4
Enter length of rectangle (1-200) : 201
Enter breadth of rectangle (1-200) : 100
Invalid Input
Press any key to continue . . .
Test Case ID : 3

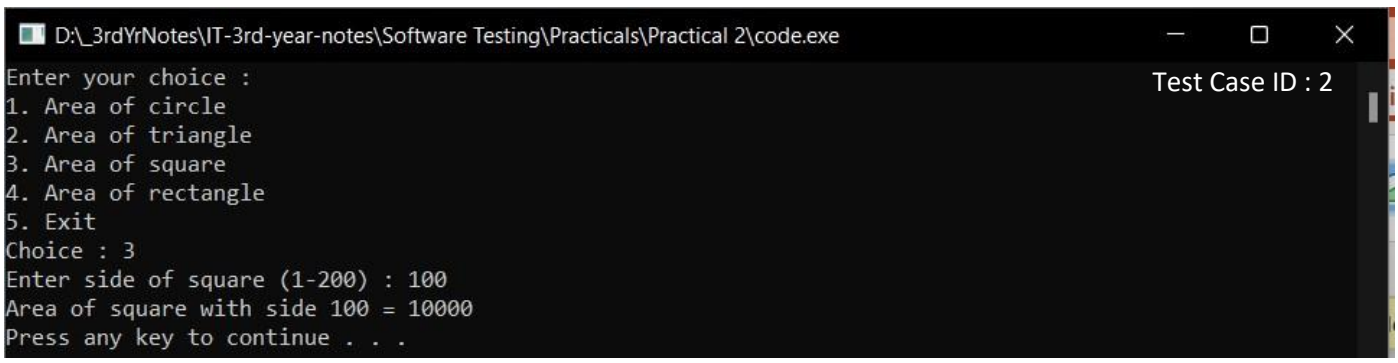

D:_3rdYrNotes\IT-3rd-year-notes\Software Testing\Practicals\Practical 2\code.exe
Enter your choice :
1. Area of circle
2. Area of triangle
3. Area of square
4. Area of rectangle
5. Exit
Choice : 4
Enter length of rectangle (1-200) : 100
Enter breadth of rectangle (1-200) : 0
Invalid Input
Press any key to continue . . .
Test Case ID : 4

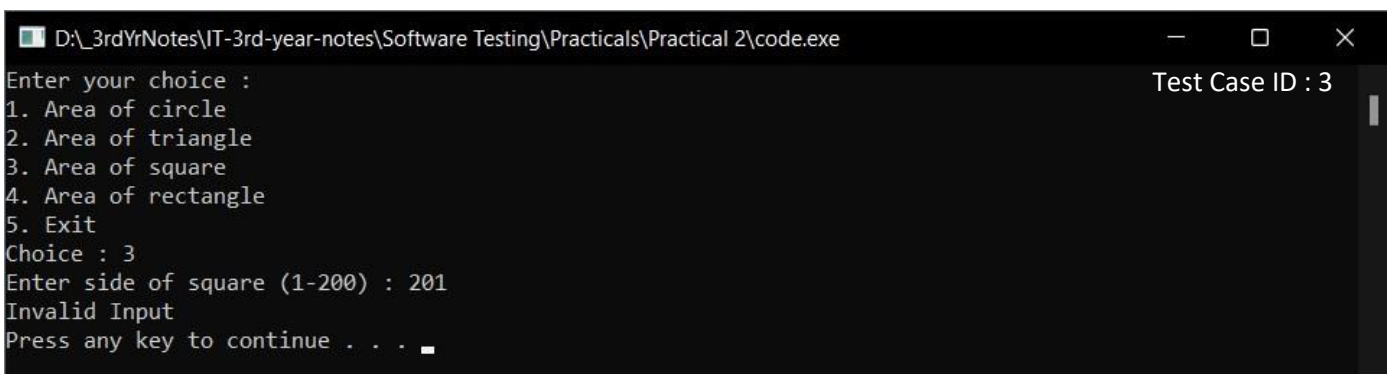

D:_3rdYrNotes\IT-3rd-year-notes\Software Testing\Practicals\Practical 2\code.exe
Enter your choice :
1. Area of circle
2. Area of triangle
3. Area of square
4. Area of rectangle
5. Exit
Choice : 4
Enter length of rectangle (1-200) : 100
Enter breadth of rectangle (1-200) : 100
Area of rectangle with length 100 and breadth 100 = 10000
Press any key to continue . . .
Test Case ID : 5


D:_3rdYrNotes\IT-3rd-year-notes\Software Testing\Practicals\Practical 2\code.exe
Enter your choice :
1. Area of circle
2. Area of triangle
3. Area of square
4. Area of rectangle
5. Exit
Choice : 4
Enter length of rectangle (1-200) : 100
Enter breadth of rectangle (1-200) : 201
Invalid Input
Press any key to continue . . .
Test Case ID : 6

Square :


D:_3rdYrNotes\IT-3rd-year-notes\Software Testing\Practicals\Practical 2\code.exe
Enter your choice :
1. Area of circle
2. Area of triangle
3. Area of square
4. Area of rectangle
5. Exit
Choice : 3
Enter side of square (1-200) : 0
Invalid Input
Press any key to continue . . .
Test Case ID : 1


D:_3rdYrNotes\IT-3rd-year-notes\Software Testing\Practicals\Practical 2\code.exe
Enter your choice :
1. Area of circle
2. Area of triangle
3. Area of square
4. Area of rectangle
5. Exit
Choice : 3
Enter side of square (1-200) : 100
Area of square with side 100 = 10000
Press any key to continue . . .
Test Case ID : 2


D:_3rdYrNotes\IT-3rd-year-notes\Software Testing\Practicals\Practical 2\code.exe
Enter your choice :
1. Area of circle
2. Area of triangle
3. Area of square
4. Area of rectangle
5. Exit
Choice : 3
Enter side of square (1-200) : 201
Invalid Input
Press any key to continue . . .
Test Case ID : 3