

## Tutorial 07

### Exercise 01

```
1  /* Name - Rathnayake W.K.G.P.M
2     Student ID - IT21810350
3     Campus - Malabe
4     Group - Y1.S1.WD.02.01.S1
5  */
6
7  #include <stdio.h>
8  #include <assert.h>
9  int qualityPoint(int average); //declaring the qualityPoint fuction
10 int main (){
11
12     int average;
13
14
15     printf("enter student's average: "); //prompt the user to input average
16     scanf("%d", &average);
17
18     assert(qualityPoint(95) == 4); //middle values
19     assert(qualityPoint(85) == 3);
20     assert(qualityPoint(75) == 2);
21     assert(qualityPoint(65) == 1);
22     assert(qualityPoint(30) == 0);
23
24     assert(qualityPoint(100) == 4); //boundary values
25     assert(qualityPoint(90) == 4);
26     assert(qualityPoint(89) == 3);
27     assert(qualityPoint(80) == 3);
28     assert(qualityPoint(79) == 2);
29     assert(qualityPoint(70) == 2);
30     assert(qualityPoint(69) == 1);
31     assert(qualityPoint(60) == 1);
32     assert(qualityPoint(0) == 0);
33
34     printf("return value is = %d", qualityPoint(average)); //display the returning value
35
36     return 0;
37 }
38
39 int qualityPoint(int average){ //implementing the function to perform how the average works
40
41     int result; //declaring a variable to assign the return value
42
43     if ((average >= 90) && (average <= 100)){ //value 4 will return when the average is in between 90-100
44         result = 4;
45     }
46     else if ((average >= 80) && (average <= 89)){ //value 3 will return when the average is in between 80-89
47         result = 3;
48     }
49     else if ((average >= 70) && (average <= 79)){ //value 2 will return when the average is in between 70-79
50         result = 2;
51     }
52     else if ((average >= 60) && (average <= 69)){ //value 1 will return when the average is in between 60-69
53         result = 1;
54     }
55     else{ //value 0 will return when the average is lower than 60
56         result = 0;
57     }
58
59     return result; //return the value within the result variable
60 }
61
```

<p>D:\OneDrive - Sri Lanka Institute of Inform</p> <pre> enter student's average: 95 return value is = 4 ----- Process exited after 3.198 seconds with return value 0 Press any key to continue . . . </pre>	<p>D:\OneDrive - Sri Lanka Institute of Information Technology\SLIIT\Assignments\</p> <pre> enter student's average: 85 return value is = 3 ----- Process exited after 1.559 seconds with return value 0 Press any key to continue . . . </pre>
<p>D:\OneDrive - Sri Lanka Institute of Inform</p> <pre> enter student's average: 75 return value is = 2 ----- Process exited after 1.533 seconds with return value 0 Press any key to continue . . . </pre>	<p>D:\OneDrive - Sri Lanka Institute of Information Technology\SLIIT\Assignments\</p> <pre> enter student's average: 65 return value is = 1 ----- Process exited after 1.458 seconds with return value 0 Press any key to continue . . . </pre>
<p>D:\OneDrive - Sri Lanka Institute of Inform</p> <pre> enter student's average: 30 return value is = 0 ----- Process exited after 1.3 seconds with return value 0 Press any key to continue . . . </pre>	<p>D:\OneDrive - Sri Lanka Institute of Information Technology\SLIIT\Assignments\</p> <pre> enter student's average: 100 return value is = 4 ----- Process exited after 1.446 seconds with return value 0 Press any key to continue . . . </pre>
<p>D:\OneDrive - Sri Lanka Institute of Inform</p> <pre> enter student's average: 89 return value is = 3 ----- Process exited after 2.806 seconds with return value 0 Press any key to continue . . . </pre>	<p>D:\OneDrive - Sri Lanka Institute of Information Technology\SLIIT\Assignments\</p> <pre> enter student's average: 80 return value is = 3 ----- Process exited after 2.171 seconds with return value 0 Press any key to continue . . . </pre>

## Exercise 02


```
1  /* Name - Rathnayake W.K.G.P.M
2     Student ID - IT21810350
3     Campus - Malabe
4     Group - Y1.S1.WD.02.01.S1
5  */
6
7  #include <stdio.h>
8  #include <math.h>
9  #include <assert.h>
10 double hypotenuse(double side1 , double side2); //declaring the function with the parameters of two sides of triangle
11 int main (){
12
13     double side1 , side2; //declaring variables to assign triangle sides
14
15     printf("enter first side length: "); //prompt the user to input the length of first side
16     scanf("%lf",&side1);
17
18     printf("enter second side length: "); //prompt the user to input the length of second side
19     scanf("%lf",&side2);
20
21     assert(hypotenuse(3.0 , 4.0) == 5.00); //assert debugging statements
22     assert(hypotenuse(5.0 , 12.0) == 13.00);
23     assert(hypotenuse(8.0 , 15.0) == 17.00);
24
25     printf("hypotenuse of the triangle is = %.2lf", hypotenuse(side1 , side2)); //display the hypotenuse of the triangle
26
27     return 0;
28 }
29
30 double hypotenuse(double side1 , double side2){ //implementing the function
31
32     double hypotenuse; //declaring a variable to assign the calculated hypotenuse of the triangle
33
34     hypotenuse = sqrt(pow(side1,2) + pow(side2,2)); //calculating hypotenuse
35
36     return fabs(hypotenuse); //returning the calculated hypotenuse
37 }
38
```

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```
enter first side length: 3.0
enter second side length: 4.0
hypotenuse of the triangle is = 5.00
-----
```

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```
enter first side length: 5.0
enter second side length: 12.0
hypotenuse of the triangle is = 13.00
```

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```
enter first side length: 8.0
enter second side length: 15.0
hypotenuse of the triangle is = 17.00
-----
```

## Exercise 03

```
1 /* Name - Rathnayake W.K.G.P.M
2    Student ID - IT21810350
3    Campus - Malabe
4    Group - Y1.S1.WD.02.01.S1
5 */
6
7 #include <stdio.h>
8 #include <math.h>
9 #include <assert.h>
10 double hypotenuse(double side1 , double side2); //declaring the function with the parameters of two sides of triangle
11 void testHypotenuse(); //declaring a fuction to test the answers are correct using assert
12 int main (){
13
14     double side1 , side2; //declaring variables to assign triangle sides
15
16     printf("enter first side length: "); //prompt the user to input the length of first side
17     scanf("%lf",&side1);
18
19     printf("enter second side length: "); //prompt the user to input the length of second side
20     scanf("%lf",&side2);
21
22     testHypotenuse(); //calling the implemented testHypotenuse function
23
24     printf("hypotenuse of the triangle is = %.2lf", hypotenuse(side1 , side2)); //display the hypotenuseof the triangle
25
26     return 0;
27 }
28
29 double hypotenuse(double side1 , double side2){ //implementing the finction
30
31     double hypotenuse; //declaring a variable to assign the calculated hupotenuse of the triangle
32
33     hypotenuse = sqrt(pow(side1,2) + pow(side2,2)); //calculating hypotenuse
34
35     return fabs(hypotenuse); //returning the calculated hypotenuse
36 }
37
38 void testHypotenuse(){ //implementing the testHypotenuse function which contains asert debugging statements
39
40     //assert debugging statements
41     assert(hypotenuse(3.0 , 4.0) == 5.00);
42     assert(hypotenuse(5.0 , 12.0) == 13.00);
43     assert(hypotenuse(8.0 , 15.0) == 17.00);
44     printf("test passed\n");
45 }
46 }
47 }
```

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```
enter first side length: 3.0
enter second side length: 4.0
test passed
hypotenuse of the triangle is = 5.00
-----
```

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```
enter first side length: 5.0
enter second side length: 12.0
test passed
hypotenuse of the triangle is = 13.00
```

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```
enter first side length: 8.0
enter second side length: 15.0
test passed
hypotenuse of the triangle is = 17.00
-----
```