

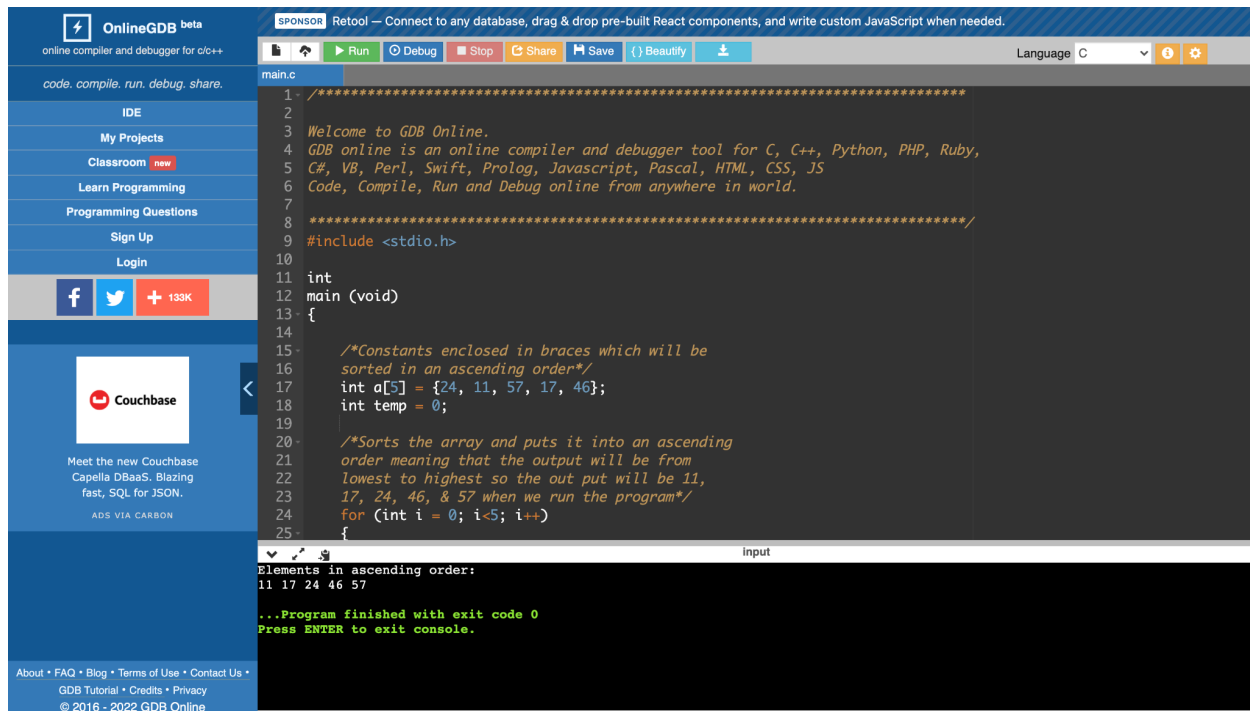
# Algorithms and Introduction to C

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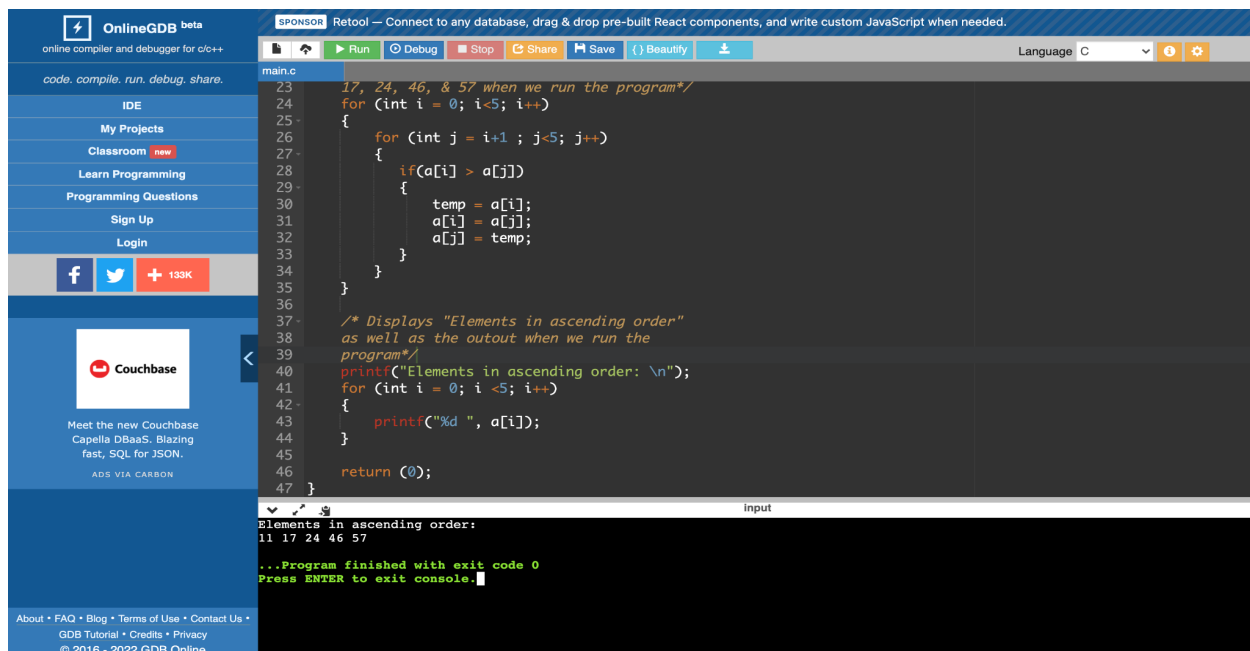
## Problem 1:



The screenshot shows the OnlineGDB interface. The code in `main.c` is as follows:

```
1- /******  
2-  
3- Welcome to GDB Online.  
4- GDB online is an online compiler and debugger tool for C, C++, Python, PHP, Ruby,  
5- C#, VB, Perl, Swift, Prolog, Javascript, Pascal, HTML, CSS, JS  
6- Code, Compile, Run and Debug online from anywhere in world.  
7-  
8- *****/  
9- #include <stdio.h>  
10-  
11- int  
12- main (void)  
13- {  
14-  
15- /*Constants enclosed in braces which will be  
16- sorted in an ascending order*/  
17- int a[5] = {24, 11, 57, 17, 46};  
18- int temp = 0;  
19-  
20- /*Sorts the array and puts it into an ascending  
21- order meaning that the output will be from  
22- lowest to highest so the out put will be 11,  
23- 17, 24, 46, & 57 when we run the program*/  
24- for (int i = 0; i<5; i++)  
25- {
```

The console output shows the elements in ascending order: 11 17 24 46 57. The program finished with exit code 0.



The screenshot shows the OnlineGDB interface. The code in `main.c` is as follows:

```
23- 17, 24, 46, & 57 when we run the program*/  
24- for (int i = 0; i<5; i++)  
25- {  
26-     for (int j = i+1 ; j<5; j++)  
27-     {  
28-         if(a[i] > a[j])  
29-         {  
30-             temp = a[i];  
31-             a[i] = a[j];  
32-             a[j] = temp;  
33-         }  
34-     }  
35- }  
36-  
37- /* Displays "Elements in ascending order"  
38- as well as the outout when we run the  
39- program*/  
40- printf("Elements in ascending order: \n");  
41- for (int i = 0; i <5; i++)  
42- {  
43-     printf("%d ", a[i]);  
44- }  
45-  
46- return (0);  
47- }
```

The console output shows the elements in ascending order: 11 17 24 46 57. The program finished with exit code 0.

### Pseudocode for problem 1:

1. Arrays are declared and initialized.
2. Array elements are selected by looping through the array.
3. Comparing the outer loop element with the remaining elements of the array will be done in the inner loop.
4. Elements whose values are smaller than the selected element should be swapped.
5. This should be done until all elements are in ascending order.
6. Run the code
7. Stop

### Code for problem 1:

```
#include <stdio.h>
```

```
int
```

```
main (void)
```

```
{
```

```
    /*Constants enclosed in braces which will be  
    sorted in an ascending order*/
```

```
    int a[5] = {24, 11, 57, 17, 46};
```

```
    int temp = 0;
```

```
    /*Sorts the array and puts it into an ascending  
    order meaning that the output will be from  
    lowest to highest so the output will be 11,  
    17, 24, 46, & 57 when we run the program*/
```

```
    for (int i = 0; i < 5; i++)
```

```
    {
```

```
        for (int j = i+1 ; j < 5; j++)
```

```
        {
```

```
            if(a[i] > a[j])
```

```
            {
```

```
                temp = a[i];
```

```
                a[i] = a[j];
```

```
                a[j] = temp;
```

```
            }
```

```
        }
```

```
    }
```

```
    /* Displays "Elements in ascending order"  
    as well as the output when we run the  
    program*/
```

```
    printf("Elements in ascending order: \n");
```

```
    for (int i = 0; i < 5; i++)
```

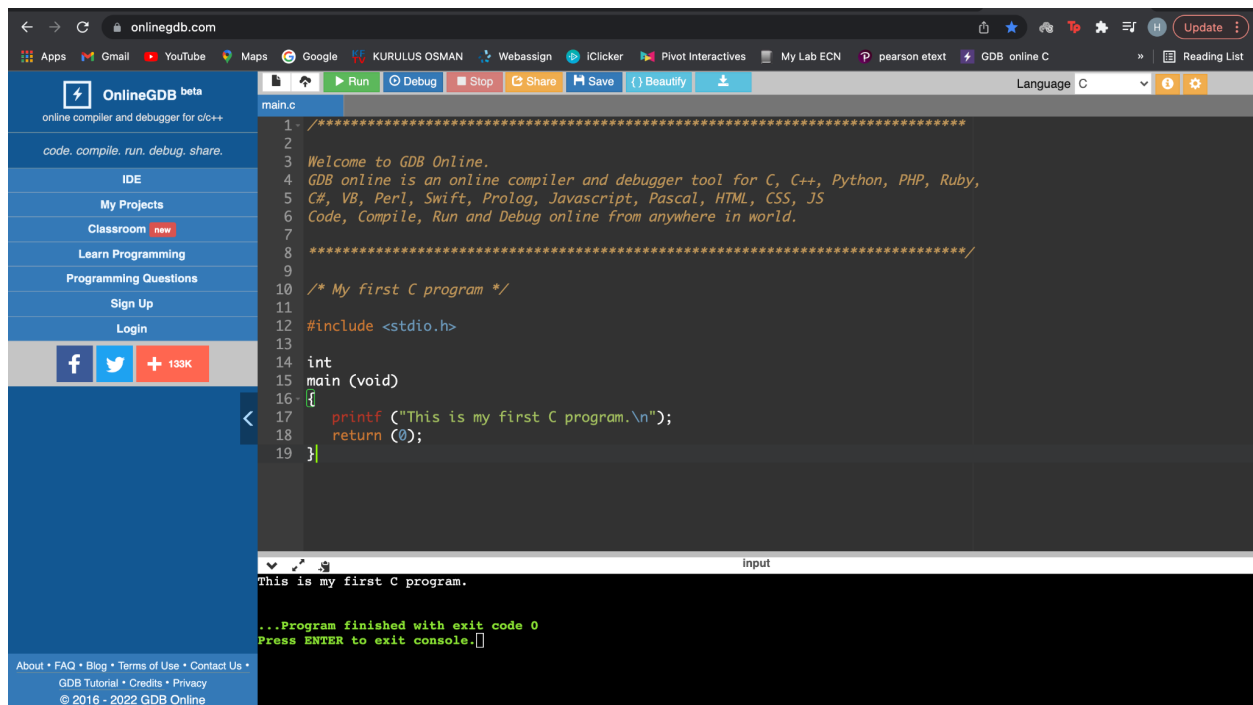
```

{
    printf("%d ", a[i]);
}

return (0);
}

```

## Problem 2:



## Code for problem 2:

```
/* My first C program */
```

```
#include <stdio.h>
```

```

int
main (void)
{
    printf ("This is my first C program.\n");
    return (0);
}

```

## Problem 3:

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online compiler and debugger for c/c++

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main.c

```
1 - /*****  
2  
3 Welcome to GDB Online.  
4 GDB online is an online compiler and debugger tool for C, C++, Python, Java, PHP, Ruby, Perl,  
5 C#, VB, Swift, Pascal, Fortran, Haskell, Objective-C, Assembly, HTML, CSS, JS, SQLite, Prolog.  
6 Code, Compile, Run and Debug online from anywhere in world.  
7  
8 *****/  
9 // a = width  
10 // b = height  
11  
12 #include<stdio.h>  
13 #include<math.h>  
14  
15 int  
16 main(void)  
17 {  
18  
19  
20 float a, b, c, Area, Perimeter;  
21 printf("\n Enter Width & Height of the Right Angled Triangle:\n");  
22 scanf("%f%f", &a, &b);  
23  
24 Area = 0.5 * a * b;  
25 c = sqrt((a*a) + (b*b));  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
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```

Input

```
Perimeter = 26.18  
Area = 25.00  
Other side = 11.18  
...Program finished with exit code 0  
Press ENTER to exit console.
```

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main.c

```
11  
12 #include<stdio.h>  
13 #include<math.h>  
14  
15 int  
16 main(void)  
17 {  
18  
19  
20 float a, b, c, Area, Perimeter;  
21 printf("\n Enter Width & Height of the Right Angled Triangle:\n");  
22 scanf("%f%f", &a, &b);  
23  
24 Area = 0.5 * a * b;  
25 c = sqrt((a*a) + (b*b));  
26 Perimeter = a+ b + c;  
27  
28 printf("\n Perimeter = %.2f\n", Perimeter);  
29 printf("\n Area = %.2f\n", Area);  
30 printf("\n Other side = %.2f\n", c);  
31  
32 return 0;  
33  
34  
35  
36  
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100
```

Input

```
Perimeter = 26.18  
Area = 25.00  
Other side = 11.18  
...Program finished with exit code 0  
Press ENTER to exit console.
```

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### Pseudocode for problem 3:

a = width

b = height

1. Read other side, a, b, and c
2. Calculate the area of a triangle  $\text{Area} = 0.5 * a * b$
3. Calculate the other side, c:  $c = \sqrt{(a * a) + (b * b)}$
4. Calculate the perimeter =  $a + b + c$
5. Display the perimeter of the right-angled triangle
6. Display the area of the right-angled triangle
7. Display the measurement for c
8. Run the code
9. Enter a value for the width and height of the right-angled triangle
10. Stop

### Code for problem 3:

```
// a = width
```

```
// b = height
```

```
#include<stdio.h>
```

```
#include<math.h>
```

```
int
```

```
main(void)
```

```
{
```

```
    float a, b, c, Area, Perimeter;
```

```
    printf("\n Enter Width & Height of the Right Angled Triangle:\n");
```

```
    scanf("%f%f",&a, &b);
```

```
    Area = 0.5 * a * b;
```

```
    c = sqrt((a*a) + (b*b));
```

```
    Perimeter = a+ b + c;
```

```
    printf("\n Perimeter = %.2f\n", Perimeter);
```

```
    printf("\n Area = %.2f\n",Area);
```

```
    printf("\n Other side = %.2f\n",c);
```

```
    return (0);
```

```
}
```

---

END OF LAB