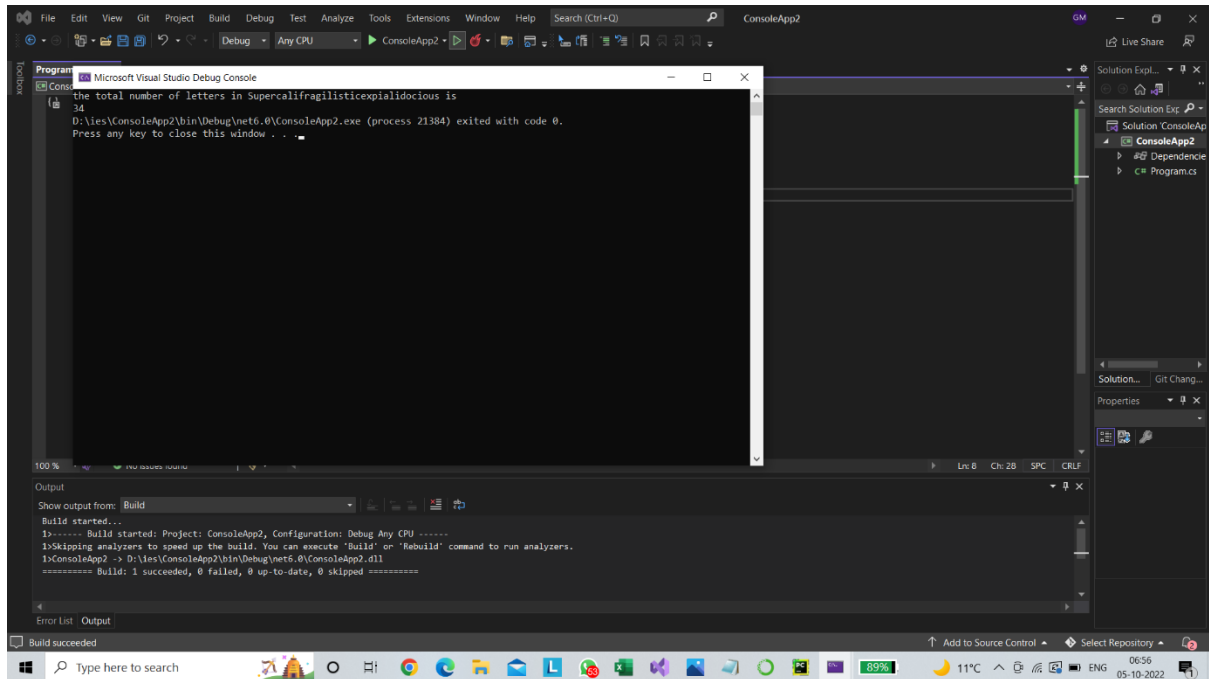


C# Program Output Screenshots

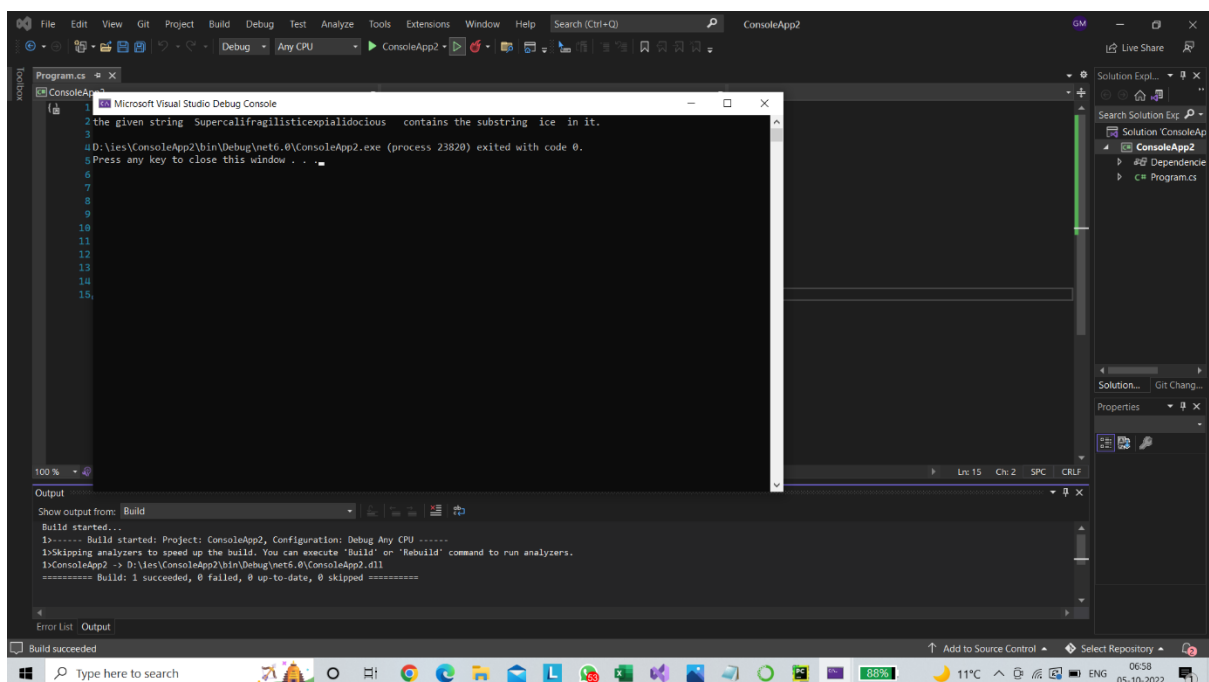
Question 2 C#

Write (and evaluate) C# expressions that answer these questions:

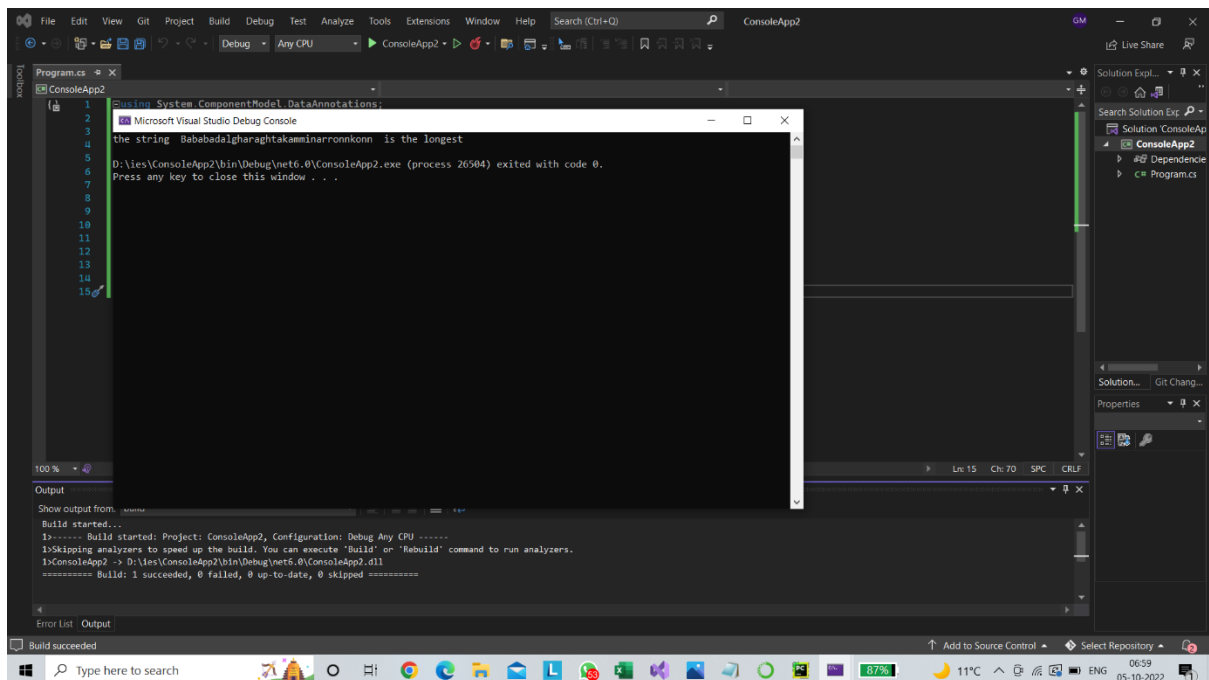
a. How many letters are there in 'Supercalifragilisticexpialidocious'?



b. Does 'Supercalifragilisticexpialidocious' contain 'ice' as a substring?



c. Which of the following words is the longest: Supercalifragilisticexpialidocious, Honorificabilitudinitatibus, or Bababadalgharaghtakamminarronkonn?



The screenshot shows a Visual Studio IDE with a console application named 'ConsoleApp2'. The code in Program.cs is as follows:

```
1 using System.ComponentModel.DataAnnotations;
2
3 the string Bababadalgharaghtakamminarronkonn is the longest
4
5
6
7
8
9
10
11
12
13
14
15
```

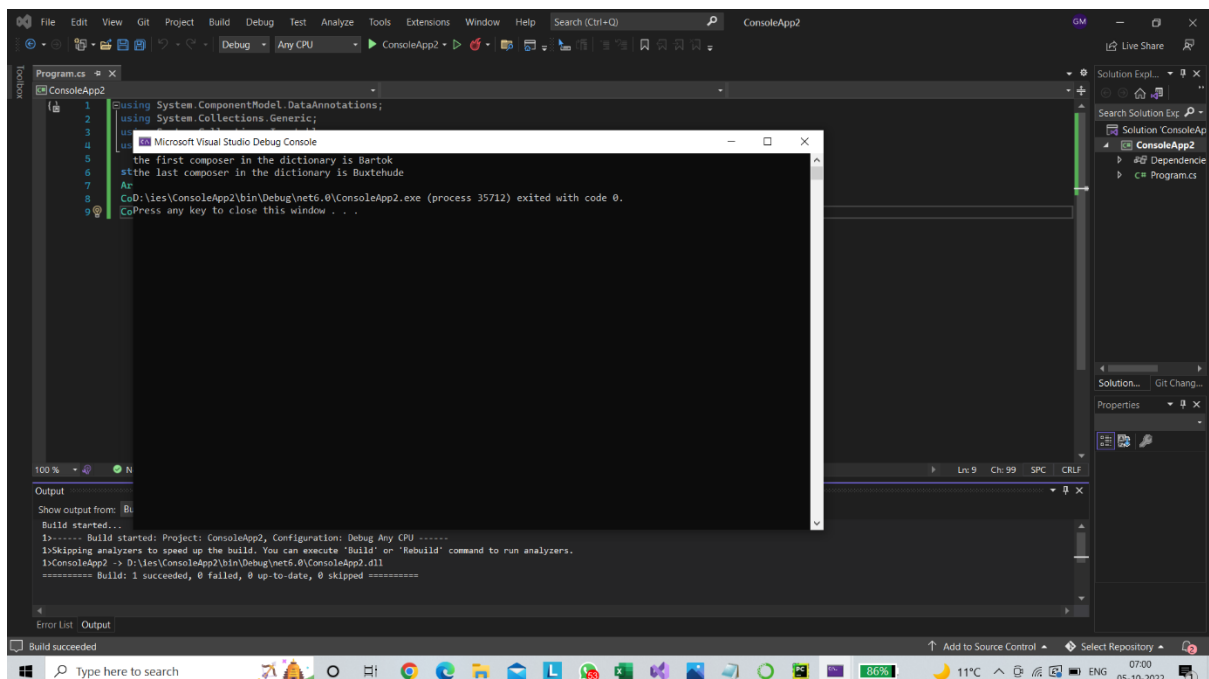
The Microsoft Visual Studio Debug Console shows the output of the application:

```
the string Bababadalgharaghtakamminarronkonn is the longest
D:\ies\ConsoleApp2\bin\Debug\net6.0\ConsoleApp2.exe (process 26504) exited with code 0.
Press any key to close this window . . .
```

The Output window shows the build process:

```
Build started...
1:----- Build started: Project: ConsoleApp2, Configuration: Debug Any CPU -----
1:Skipping analyzers to speed up the build. You can execute 'Build' or 'Rebuild' command to run analyzers.
1:ConsoleApp2 -> D:\ies\ConsoleApp2\bin\Debug\net6.0\ConsoleApp2.dll
***** Build: 1 succeeded, 0 failed, 0 up-to-date, 0 skipped *****
```

d. Which composer comes first in the dictionary: 'Berlioz', 'Borodin', 'Brian', 'Bartok', 'Bellini', 'Buxtehude', 'Bernstein'. Which one comes last?



The screenshot shows a Visual Studio IDE with a console application named 'ConsoleApp2'. The code in Program.cs is as follows:

```
1 using System.ComponentModel.DataAnnotations;
2 using System.Collections.Generic;
3
4 using Microsoft.VisualStudio.TestTools.UnitTesting;
5
6 the first composer in the dictionary is Bartok
7 the last composer in the dictionary is Buxtehude
8
9 Console.WriteLine("The first composer in the dictionary is Bartok");
10 Console.WriteLine("The last composer in the dictionary is Buxtehude");
11
```

The Microsoft Visual Studio Debug Console shows the output of the application:

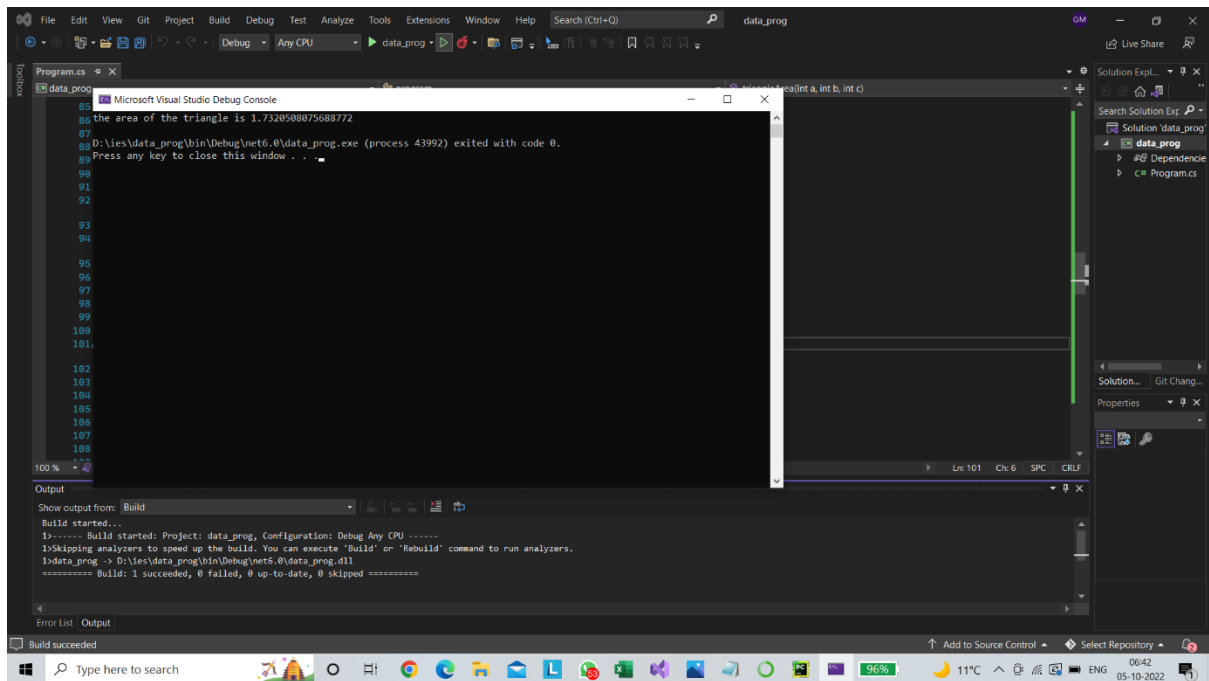
```
the first composer in the dictionary is Bartok
the last composer in the dictionary is Buxtehude
D:\ies\ConsoleApp2\bin\Debug\net6.0\ConsoleApp2.exe (process 35712) exited with code 0.
Press any key to close this window . . .
```

The Output window shows the build process:

```
Build started...
1:----- Build started: Project: ConsoleApp2, Configuration: Debug Any CPU -----
1:Skipping analyzers to speed up the build. You can execute 'Build' or 'Rebuild' command to run analyzers.
1:ConsoleApp2 -> D:\ies\ConsoleApp2\bin\Debug\net6.0\ConsoleApp2.dll
***** Build: 1 succeeded, 0 failed, 0 up-to-date, 0 skipped *****
```

Question 3 C#

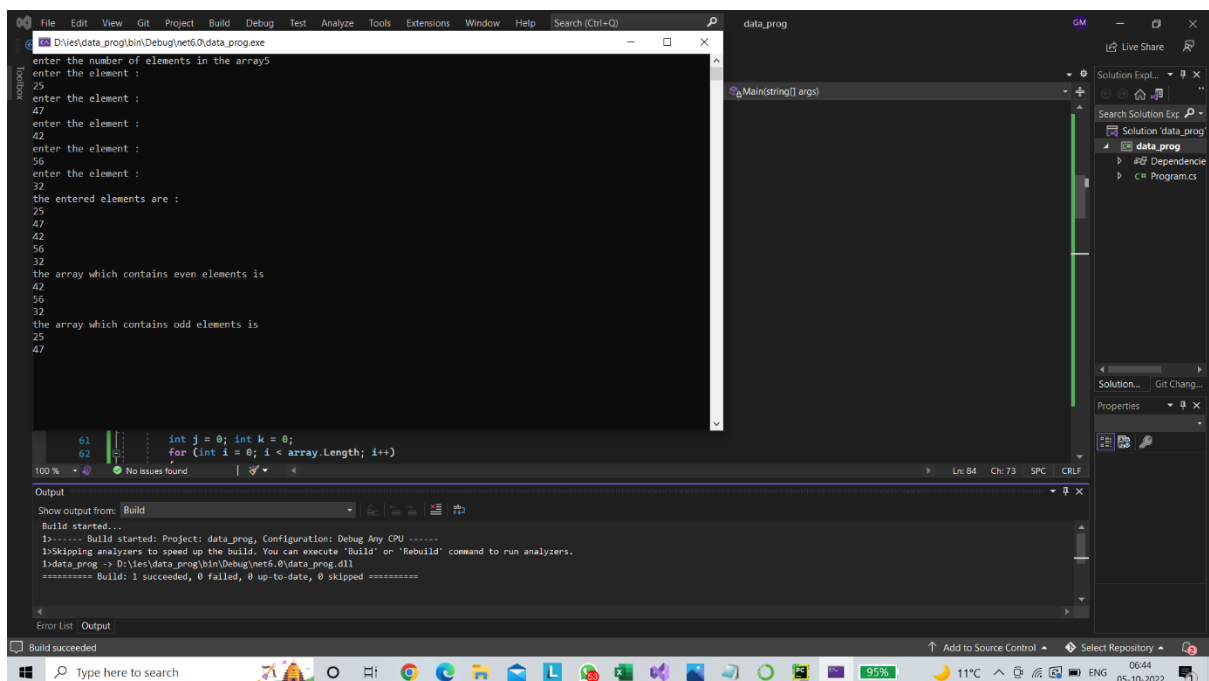
Implement function `triangleArea(a,b,c)` that takes as input the lengths of the 3 sides of a triangle and returns the area of the triangle. By Heron's formula, the area of a triangle with side lengths a , b , and c is $s(s-a)(s-b)(s-c)$, where $s = (a + b + c)/2$.



The screenshot shows the Visual Studio IDE with a C# program named `data_prog`. The program is running in the Debug Console, displaying the output: "the area of the triangle is 1.7320508075688772". The code in the background defines a function `triangleArea` that takes three integers `a`, `b`, and `c` as input and returns the area of the triangle. The output window shows the build process and the execution of the program.

Question 4 C#

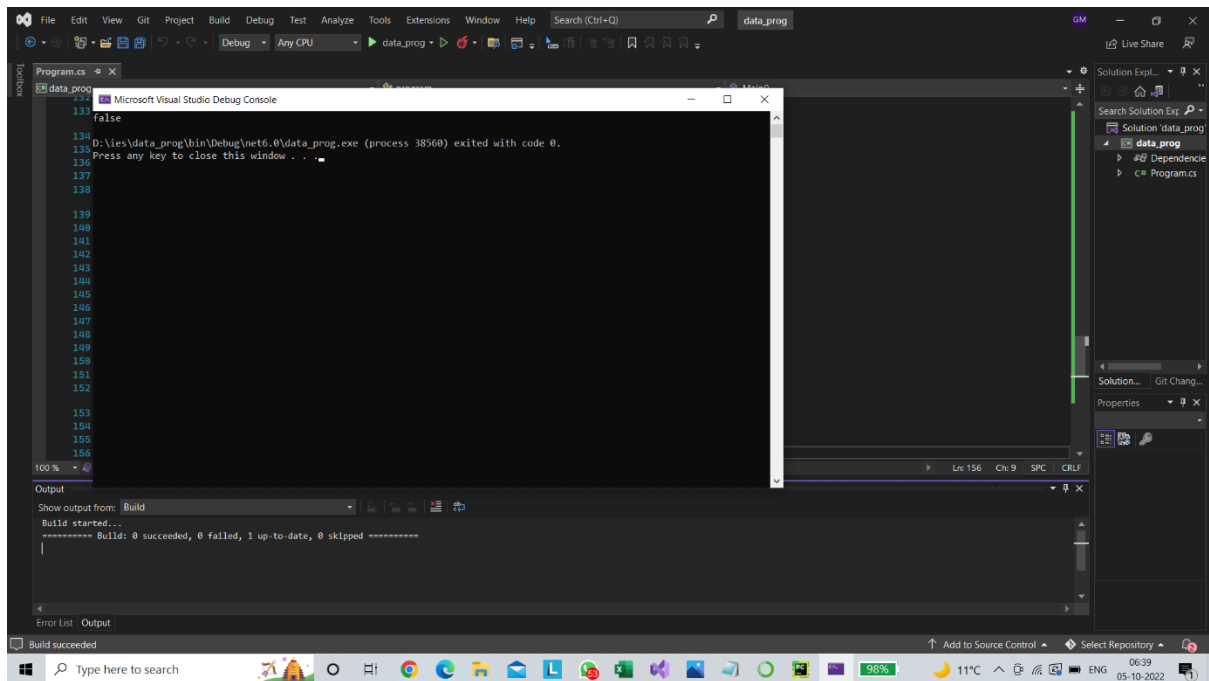
Write a program in C# Sharp to separate odd and even integers in separate arrays.



The screenshot shows the Visual Studio IDE with a C# program named `data_prog`. The program is running in the Debug Console, displaying the output: "enter the number of elements in the array: 5", "enter the element: 25", "enter the element: 47", "enter the element: 42", "enter the element: 56", "enter the element: 32", "the entered elements are: 25 47 42 56 32", "the array which contains even elements is: 42 56 32", "the array which contains odd elements is: 25 47". The code in the background defines a function `SeparateOddEven` that takes an array of integers and returns two arrays: one containing even elements and one containing odd elements. The output window shows the build process and the execution of the program.

Question 5 C#

a. Write a function inside `(x,y,x1,y1,x2,y2)` that returns True or False depending on whether the point `(x,y)` lies in the rectangle with lower left corner `(x1,y1)` and upper right corner `(x2,y2)`.



b. Use function `inside()` from part a. to write an expression that tests whether the point `(1,1)` lies in both of the following rectangles: one with lower left corner `(0.3, 0.5)` and upper right corner `(1.1, 0.7)` and the other with lower left corner `(0.5, 0.2)` and upper right corner `(1.1, 2)`.

