CONST
&
READONLY

CONST

The keyword **const** is used to create a **constant variable.**

```
const float PI = 3.14f;
const float TaxRate = 0.15f;
```

Constant Variable

- A constant variable is a variable whose value cannot be modified once it is declared.
- It is used to make our code readable, reusable, maintainable, and to avoid errors.

Declaring Constant Variable

- It is mandatory to initialize a constant variable at the time of its declaration.

```
(local constant) float PI =
A const field requires a value to be provided [const-and-readonly] csharp(CS0145)
View Problem (Alt+F8)    No quick fixes available
const float PI;
```

```
const float PI = 3.14f;
```

Using Constant Variable in A Class

- A constant variable is static by default. It is associated with a class instead of any one instance of the class.
- A constant variable can be initialized/accessed without any instance of the class (object).
- Constant variables are compile-time constants. So, it does not make any sense to have one copy of constant variable per instance of the class.

```
4 references
public class Circle
{
    1 reference
    const float PI = 3.14f;
    3 references
    float Radius;
    2 references
    Circle(float radius)
    {
        Radius = radius;
    }
    2 references
    public void CalculateArea()
    {
        Console.WriteLine($"Area = {PI * Radius * Radius}");
    }
```

```
        0 references
13      static void Main(string[] args)
14      {
15          Circle c1 = new Circle(3);
16          Console.WriteLine("Circle c1");
17          c1.CalculateArea();
18
19          Circle c2 = new Circle(4);
20          Console.WriteLine("Circle c2");
21          c2.CalculateArea();
22      }
23  }
```

Output

```
Circle c1
Area = 28.26
Circle c2
Area = 50.24
```

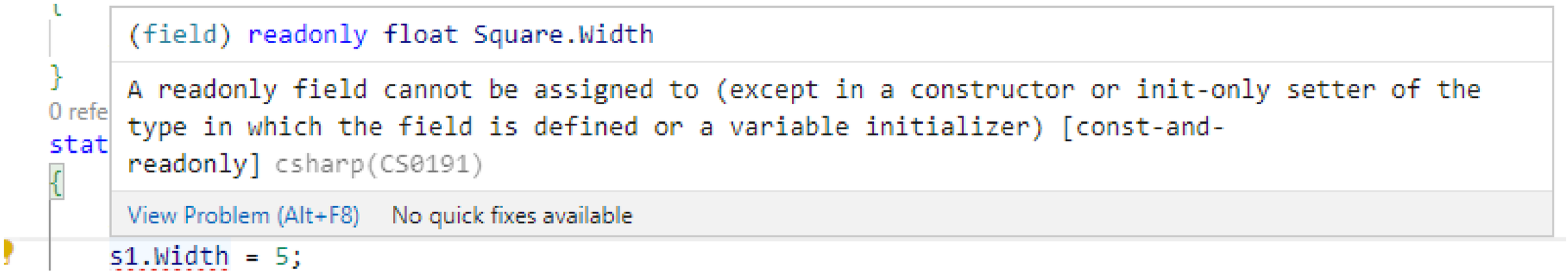
READONLY

The keyword readonly is used to create a **readonly variable** in C#**.**

```
readonly float Width = 4;
readonly float Width;
```

Read-only Variable

- The read-only variable’s value cannot be modified once after its initialization.



Declaring Read-only Variable

- It is not mandatory or required to initialize the read-only variable at the time of its declaration like a constant.

```
readonly float Width = 4;
readonly float Width;
```

Using Read-only Variable in A Class

- We can initialize the read-only variables during its declaration in a class.
- Or, we can initialize the read-only variables under a constructor.
- The behavior of a read-only variable is similar to the behavior of a non-static variable. That is, it maintains a separate copy for each object.
- The only difference between these two is that the value of the non-static variable can be modified from outside the constructor while the value of the read-only variable cannot be modified from outside the constructor body.

```
1   public class Square
2   {
        3 references
3       readonly float Width = 4;
        1 reference
4       public Square() { }
        1 reference
5       public Square(float width)
6       {
7           Width = width;
8       }
        2 references
9       public void CalculateArea()
10      {
11          System.Console.WriteLine
12          ($"Area = {Width * Width}");
13      }
14      static void Main(string[] args)
15      {
16          Square s1 = new Square();
17          System.Console.WriteLine
18          ("Square s1");
19          s1.CalculateArea();
20
21          Square s2 = new Square(10);
22          System.Console.WriteLine
23          ("Square s2");
24          s2.CalculateArea();
25      }
26  }
```

Output

```
Square s1
Area = 16
Square s2
Area = 100
```

Difference between Const and Read-only

A constant is a fixed value for the whole class whereas readonly is a fixed value specific to an instance of a class and for each instance.

Const	Read-only
Constant fields are created using const keyword.	Readonly fields are created using readonly keyword
Const is a compile time constant.	ReadOnly is a runtime constant.
The value of the const field can not be changed. In const fields, we can only assign values in declaration part.	The value of readonly field can be changed. In readonly fields, we can assign values in declaration and in the constructor part.
It can be declared inside the method.	It cannot be declared inside the method.
It cannot be used with static modifiers.	It can be used with static modifiers

THANK YOU