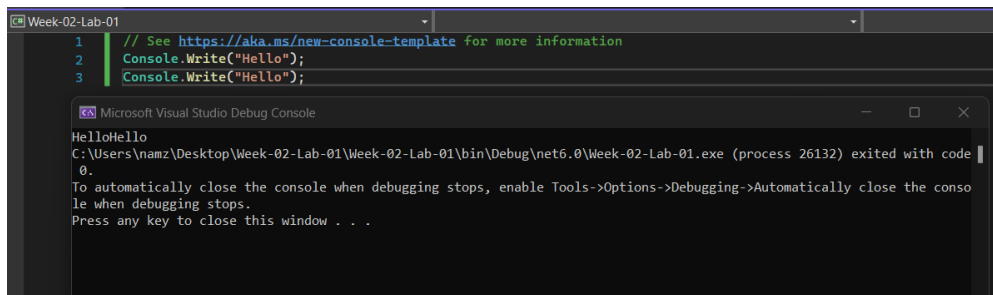


## 2.1 การใช้เมธอด Console.Write()



```
1 // See https://aka.ms/new-console-template for more information
2 Console.Write("Hello");
3 Console.Write("Hello");
```

Microsoft Visual Studio Debug Console

HelloHello

C:\Users\namz\Desktop\Week-02-Lab-01\Week-02-Lab-01\bin\Debug\net6.0\Week-02-Lab-01.exe (process 26132) exited with code 0.

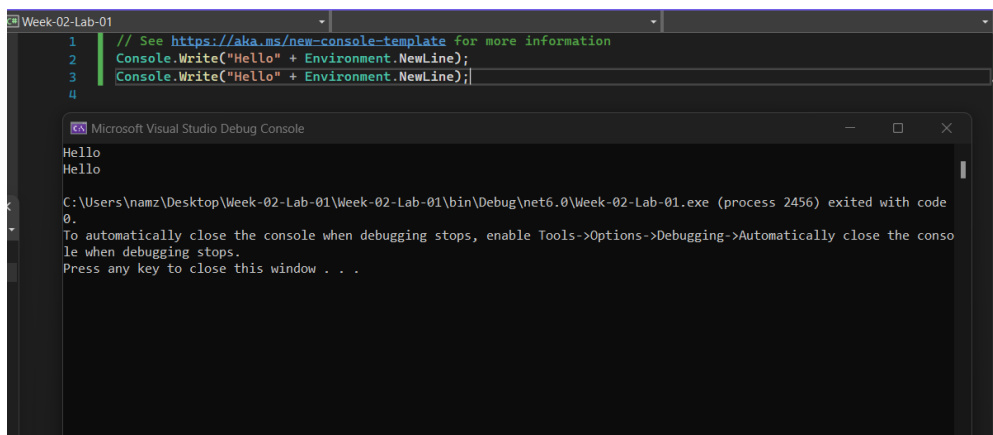
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.

Press any key to close this window . . .

? ผลที่ได้จากการทดลอง เป็นอย่างที่คุณศึกษาคิดหรือไม่ อย่างไร จงอธิบาย

- เป็นอย่างที่คิด โปรแกรมสามารถรันได้ และข้อความ HELLO ติดกัน

## 2.2 การใช้เมธอด Console.Write() ร่วมกับ Environment.NewLine



```
1 // See https://aka.ms/new-console-template for more information
2 Console.Write("Hello" + Environment.NewLine);
3 Console.Write("Hello" + Environment.NewLine);
4
```

Microsoft Visual Studio Debug Console

Hello

Hello

C:\Users\namz\Desktop\Week-02-Lab-01\Week-02-Lab-01\bin\Debug\net6.0\Week-02-Lab-01.exe (process 2456) exited with code 0.

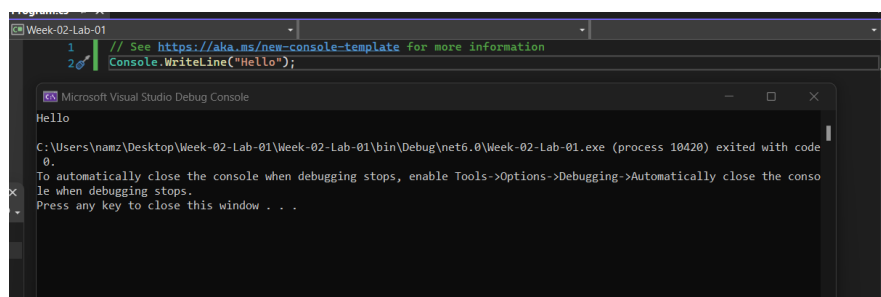
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.

Press any key to close this window . . .

? ผลที่ได้จากการทดลอง เป็นอย่างที่คุณศึกษาคิดหรือไม่ อย่างไร จงอธิบาย

- เป็นอย่างที่คิด โปรแกรมสามารถรันได้ และข้อความ HELLO เว้นบรรทัด

## 3. เมธอด Console.WriteLine()



```
1 // See https://aka.ms/new-console-template for more information
2 Console.WriteLine("Hello");
```

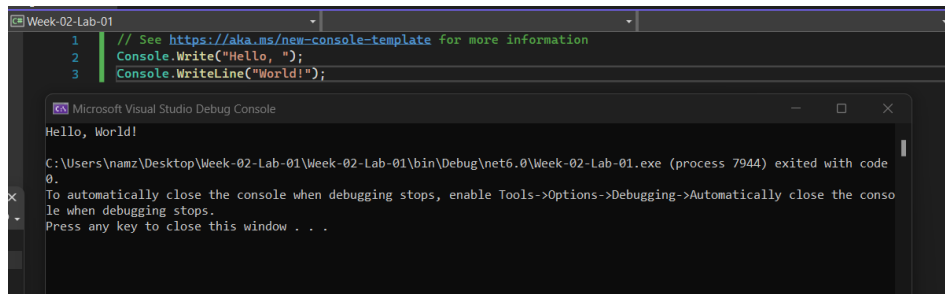
Microsoft Visual Studio Debug Console

Hello

C:\Users\namz\Desktop\Week-02-Lab-01\Week-02-Lab-01\bin\Debug\net6.0\Week-02-Lab-01.exe (process 10420) exited with code 0.

To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.

Press any key to close this window . . .



รันโปรแกรมและบันทึกผล

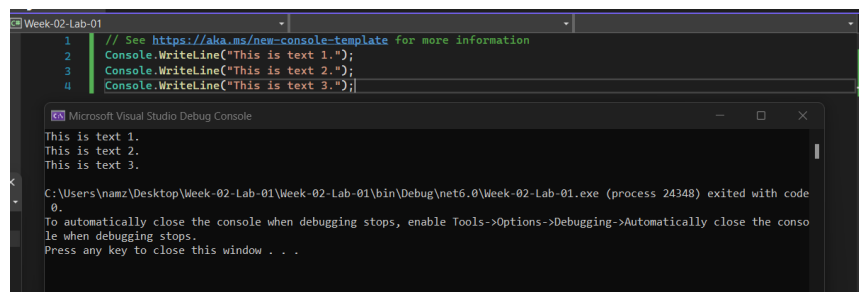
? ผลที่ได้จากการทดลอง เป็นอย่างไรที่นักศึกษาคิดหรือไม่ อย่างไร จงอธิบาย

- เป็นอย่างไรที่คิด Console.WriteLine() เป็นคำสั่งที่เทียบเท่ากับการใช้ Console.Write ร่วมกับ Environment.NewLine ทำให้ประหยัดเวลาในการเขียนโปรแกรม

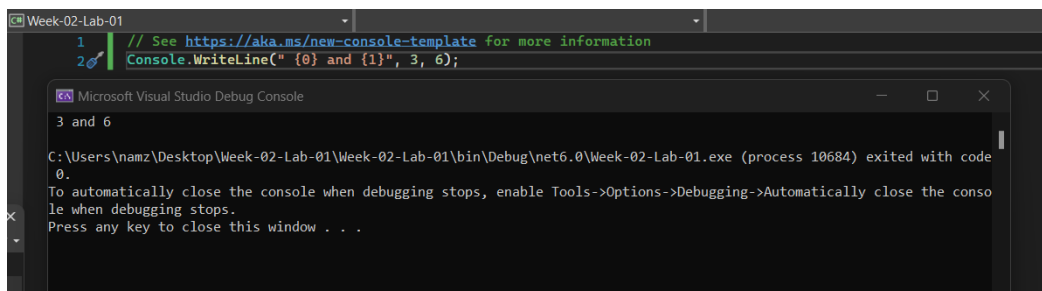
? จงอธิบายความแตกต่างระหว่างคำสั่ง Console.Write() และ Console.WriteLine()

- Console.Write ใช้สำหรับการแสดงผลข้อมูลออกสู่หน้าจอ
- Console.WriteLine ใช้สำหรับการแสดงผลข้อมูลออกสู่หน้าจอแบบขึ้นบรรทัดใหม่

## Part 4 จำนวนของอาร์กิวเมนต์ในคำสั่ง Console.WriteLine()

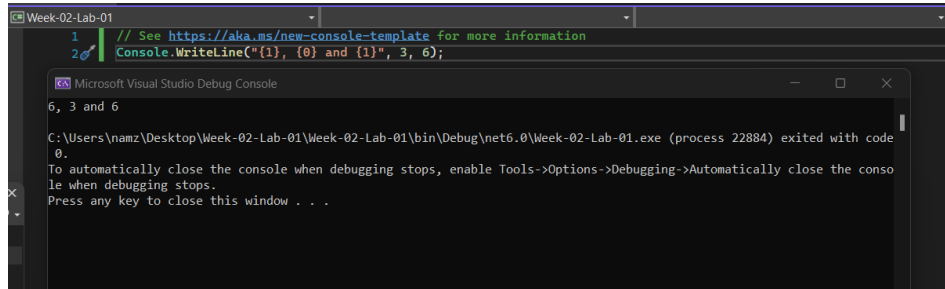


การนับลำดับ place holder จะเริ่มจากตัวแรกที่มีค่าเป็น 0



? ถ้ามีการใช้ตัวเลขใน { } ที่กระโดด เช่น {0} {2} {3} จะใช้งานได้หรือไม่ อย่างไร จงอธิบาย

- ใช้งานได้บางค่า และไม่สามารถใช้ตัวเลขซ้ำได้ เช่น {3},{3}



```
1 // See https://aka.ms/new-console-template for more information
2 Console.WriteLine("{1}, {0} and {1}", 3, 6);
```

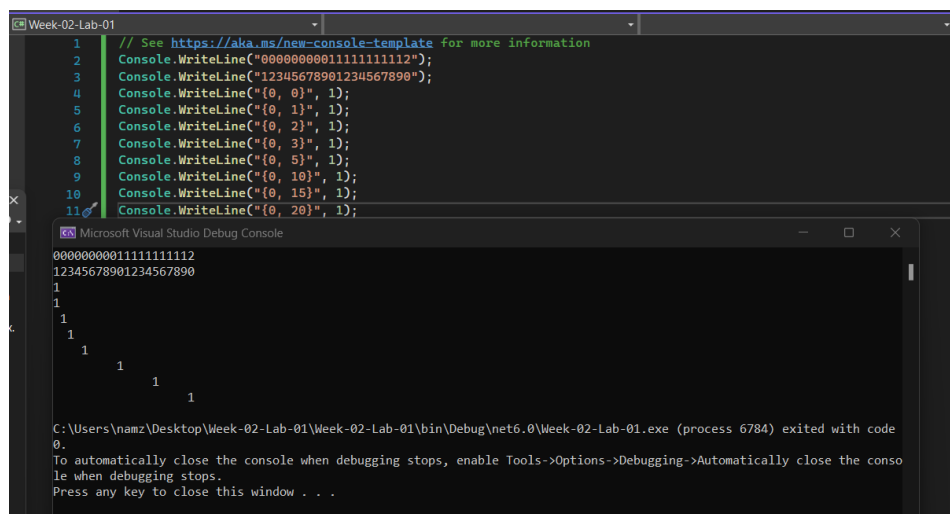
6, 3 and 6

C:\Users\namz\Desktop\Week-02-Lab-01\Week-02-Lab-01\bin\Debug\net6.0\Week-02-Lab-01.exe (process 22884) exited with code 0.

To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.

Press any key to close this window . . .

## Part 5 การกำหนดความกว้างของอาร์กิวเมนต์



```
1 // See https://aka.ms/new-console-template for more information
2 Console.WriteLine("0000000001111111112");
3 Console.WriteLine("12345678901234567890");
4 Console.WriteLine("{0, 0}", 1);
5 Console.WriteLine("{0, 1}", 1);
6 Console.WriteLine("{0, 2}", 1);
7 Console.WriteLine("{0, 3}", 1);
8 Console.WriteLine("{0, 4}", 1);
9 Console.WriteLine("{0, 5}", 1);
10 Console.WriteLine("{0, 10}", 1);
11 Console.WriteLine("{0, 15}", 1);
12 Console.WriteLine("{0, 20}", 1);
```

0000000001111111112

12345678901234567890

1

1 1

1 1 1

1 1 1 1

1 1 1 1 1

1 1 1 1 1 1

1 1 1 1 1 1 1

1 1 1 1 1 1 1 1

1 1 1 1 1 1 1 1 1

1 1 1 1 1 1 1 1 1 1

C:\Users\namz\Desktop\Week-02-Lab-01\Week-02-Lab-01\bin\Debug\net6.0\Week-02-Lab-01.exe (process 6784) exited with code 0.

To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.

Press any key to close this window . . .

? การกำหนดความกว้างของอาร์กิวเมนต์ด้วยเครื่องหมาย { , } ในคำสั่ง Console.WriteLine() มีรูปแบบการใช้งานอย่างไร

- เป็นตัวเว้นจำนวนช่องว่างที่ต้องการ

## 6. การกำหนดรูปแบบของอาร์กิวเมนต์

```
Week-02-Lab-01
1 // See https://aka.ms/new-console-template for more information
2 int n = 123456789;
3 Console.WriteLine("{0, 0:E}", n);
4 Console.WriteLine("{0, 0:F}", n);
5 Console.WriteLine("{0, 0:G}", n);
6 Console.WriteLine("{0, 0:N}", n);
7 Console.WriteLine("{0, 0:P}", n);
8 Console.WriteLine("{0, 0:X}", n);

Microsoft Visual Studio Debug Console
1.234568E+008
123456789.00
123456789
123,456,789.00
12,345,678,900.00%
75BCD15

C:\Users\namz\Desktop\Week-02-Lab-01\Week-02-Lab-01\bin\Debug\net6.0\Week-02-Lab-01.exe (process 23176) exited with code
0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the conso
le when debugging stops.
Press any key to close this window . . .
```

## 7. การกำหนดรูปแบบพร้อมความกว้างของอาร์กิวเมนต์

```
Week-02-Lab-01
1 // See https://aka.ms/new-console-template for more information
2 int n = 123456789;
3 Console.WriteLine("{0, 20:E}", 1);
4 Console.WriteLine("{0, 20:F}", 1);
5 Console.WriteLine("{0, 20:G}", 1);
6 Console.WriteLine("{0, 20:N}", 1);
7 Console.WriteLine("{0, 20:P}", 1);
8 Console.WriteLine("{0, 20:X}", 1);

Microsoft Visual Studio Debug Console
1.0000000E+000
1.00
1
100.00%
1

C:\Users\namz\Desktop\Week-02-Lab-01\Week-02-Lab-01\bin\Debug\net6.0\Week-02-Lab-01.exe (process 18892) exited with code
0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the conso
le when debugging stops.
Press any key to close this window . . .
```

## Part 8 การกำหนดรูปแบบพร้อมความกว้างของทศนิยมของอาร์กิวเมนต์

```
Week-02-Lab-01
1 // See https://aka.ms/new-console-template for more information
2 const double i = 123.456789d;
3 Console.WriteLine("{0:F1}", i);
4 Console.WriteLine("{0:F2}", i);
5 Console.WriteLine("{0:F3}", i);
6 Console.WriteLine("{0:F4}", i);
7 Console.WriteLine("{0:F5}", i);

Microsoft Visual Studio Debug Console
123.5
123.46
123.457
123.4568
123.45679

C:\Users\namz\Desktop\Week-02-Lab-01\Week-02-Lab-01\bin\Debug\net6.0\Week-02-Lab-01.exe (process 24984) exited with code
0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the conso
le when debugging stops.
Press any key to close this window . . .
```

? แบบฝึกหัด จงรันโปรแกรมและบันทึกภาพ output ของบรรทัดคำสั่งต่อไปนี้

1.string name = "Hello";

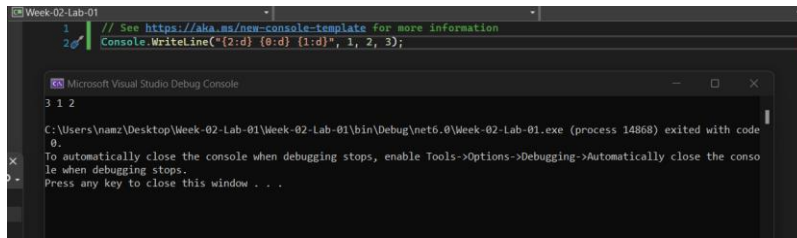
Console.WriteLine(String.Format("{0} there. I said {0}! {0}???", name));

```
Week-02-Lab-01
1 // See https://aka.ms/new-console-template for more information
2 string name = "Hello";
3 Console.WriteLine(String.Format("{0} there. I said {0}! {0}???", name));

Microsoft Visual Studio Debug Console
Hello there. I said Hello! Hello???

C:\Users\namz\Desktop\Week-02-Lab-01\Week-02-Lab-01\bin\Debug\net6.0\Week-02-Lab-01.exe (process 14468) exited with code
0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the conso
le when debugging stops.
Press any key to close this window . . .
```

2. Console.WriteLine("{2:d} {0:d} {1:d}", 1, 2, 3);



```
1 // See https://aka.ms/new-console-template for more information
2 Console.WriteLine($"{2:d} {0:d} {1:d}", 1, 2, 3);
```

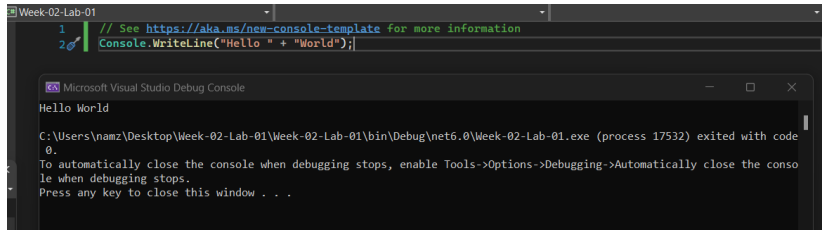
3 1 2

C:\Users\namz\Desktop\Week-02-Lab-01\Week-02-Lab-01\bin\Debug\net6.0\Week-02-Lab-01.exe (process 14868) exited with code 0.

To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.

Press any key to close this window . . .

3. Console.WriteLine("Hello " + "World");



```
1 // See https://aka.ms/new-console-template for more information
2 Console.WriteLine("Hello " + "World");
```

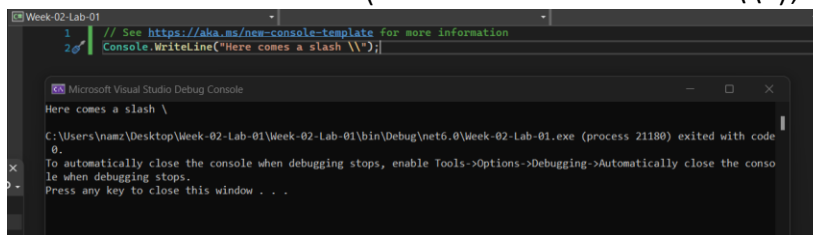
Hello World

C:\Users\namz\Desktop\Week-02-Lab-01\Week-02-Lab-01\bin\Debug\net6.0\Week-02-Lab-01.exe (process 17532) exited with code 0.

To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.

Press any key to close this window . . .

4. Console.WriteLine("Here comes a slash \\");



```
1 // See https://aka.ms/new-console-template for more information
2 Console.WriteLine("Here comes a slash \\");
```

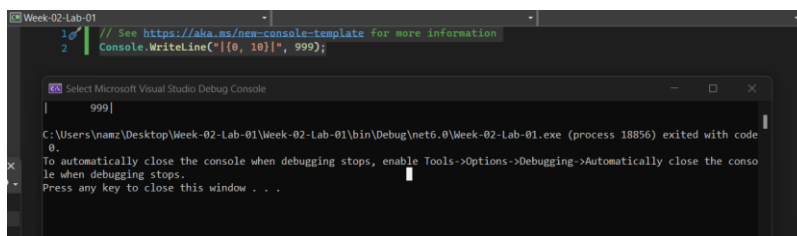
Here comes a slash \

C:\Users\namz\Desktop\Week-02-Lab-01\Week-02-Lab-01\bin\Debug\net6.0\Week-02-Lab-01.exe (process 21180) exited with code 0.

To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.

Press any key to close this window . . .

5. Console.WriteLine(\$"{0, 10}|", 999);



```
1 // See https://aka.ms/new-console-template for more information
2 Console.WriteLine($"{0, 10}|", 999);
```

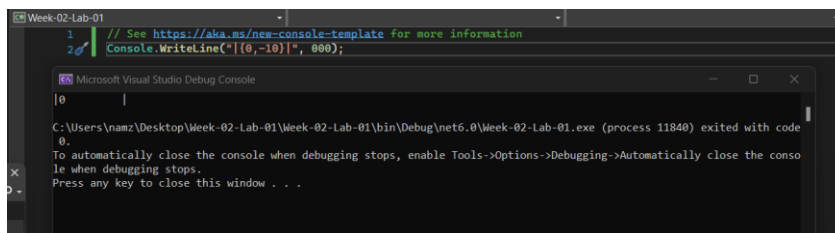
999|

C:\Users\namz\Desktop\Week-02-Lab-01\Week-02-Lab-01\bin\Debug\net6.0\Week-02-Lab-01.exe (process 18856) exited with code 0.

To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.

Press any key to close this window . . .

6. Console.WriteLine(\$"{0,-10}|", 000);



```
1 // See https://aka.ms/new-console-template for more information
2 Console.WriteLine($"{0,-10}|", 000);
```

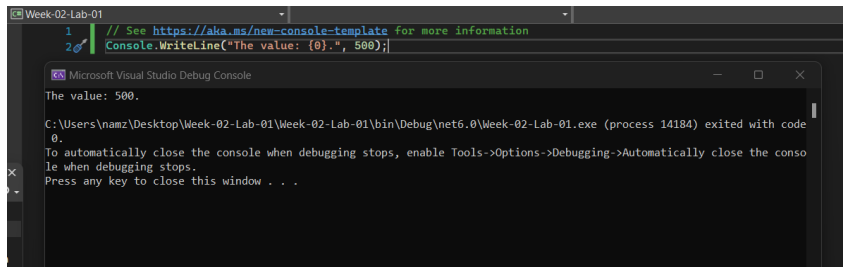
0|

C:\Users\namz\Desktop\Week-02-Lab-01\Week-02-Lab-01\bin\Debug\net6.0\Week-02-Lab-01.exe (process 11840) exited with code 0.

To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.

Press any key to close this window . . .

7. Console.WriteLine("The value: {0}.", 500);



```
1 // See https://aka.ms/new-console-template for more information
2 Console.WriteLine("The value: {0:C}.", 500);
```

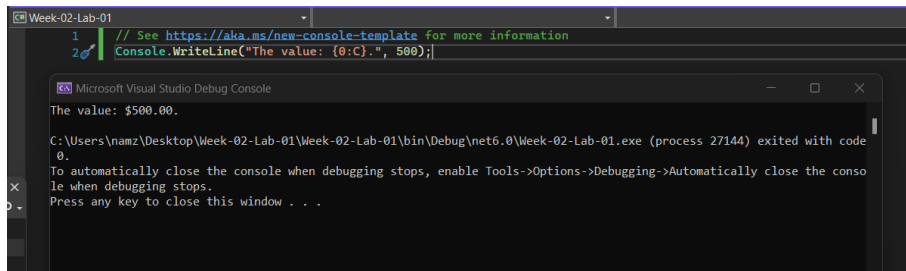
The value: 500.

C:\Users\namz\Desktop\Week-02-Lab-01\Week-02-Lab-01\bin\Debug\net6.0\Week-02-Lab-01.exe (process 14184) exited with code 0.

To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.

Press any key to close this window . . .

8. `Console.WriteLine("The value: {0:C}.", 500);`



```
1 // See https://aka.ms/new-console-template for more information
2 Console.WriteLine("The value: {0:C}.", 500);
```

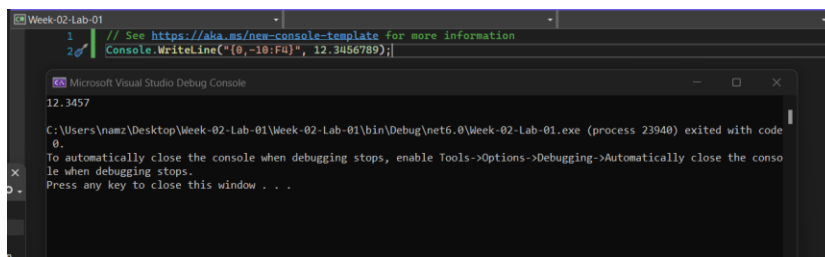
The value: \$500.00.

C:\Users\namz\Desktop\Week-02-Lab-01\Week-02-Lab-01\bin\Debug\net6.0\Week-02-Lab-01.exe (process 27144) exited with code 0.

To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.

Press any key to close this window . . .

9. `Console.WriteLine("{0,-10:F4}", 12.3456789);`



```
1 // See https://aka.ms/new-console-template for more information
2 Console.WriteLine("{0,-10:F4}", 12.3456789);
```

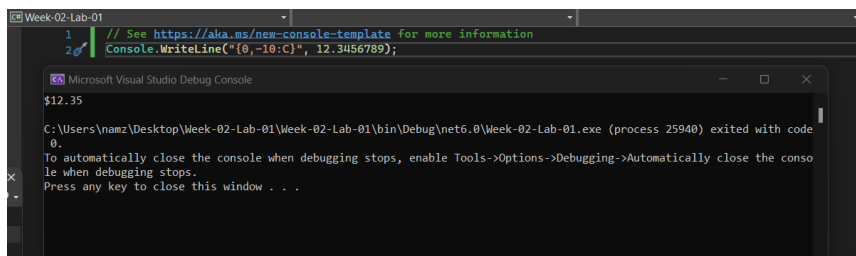
12.3457

C:\Users\namz\Desktop\Week-02-Lab-01\Week-02-Lab-01\bin\Debug\net6.0\Week-02-Lab-01.exe (process 23940) exited with code 0.

To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.

Press any key to close this window . . .

10. `Console.WriteLine("{0,-10:C}", 12.3456789);`



```
1 // See https://aka.ms/new-console-template for more information
2 Console.WriteLine("{0,-10:C}", 12.3456789);
```

\$12.35

C:\Users\namz\Desktop\Week-02-Lab-01\Week-02-Lab-01\bin\Debug\net6.0\Week-02-Lab-01.exe (process 25940) exited with code 0.

To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.

Press any key to close this window . . .

11. `Console.WriteLine("{0,-10:E3}", 12.3456789);`

12. `Console.WriteLine("{0,-10:x}", 65535); // (x = lower case)`

13. `Console.WriteLine("{0,-10:X}", 65535); // (X = upper case)`

14. `int i;`

`Console.WriteLine("Value\tSquared\tCubed");`

`for(i = 1; i < 10; i++)`

`Console.WriteLine("{0}\t{1}\t{2}", i, i*i, i*i*i);`

```

1 // See https://aka.ms/new-console-template for more information
2 int i;
3 Console.WriteLine("Value\tSquared\tCubed");
4 for (i = 1; i < 10; i++)
5     Console.WriteLine("{0}\t{i}\t{i^2}", i, i * i, i * i * i);

```

Value	Squared	Cubed
1	1	1
2	4	8
3	9	27
4	16	64
5	25	125
6	36	216
7	49	343
8	64	512
9	81	729

15. Console.WriteLine("{0:#.###}.", 1234.56789);

```

1 // See https://aka.ms/new-console-template for more information
2 Console.WriteLine("{0:#.###}.", 1234.56789);

```

1234.568.

การใช้งานคำสั่ง Console.Read() และ Console.ReadLine()

```

1 // See https://aka.ms/new-console-template for more information
2 char ch;
3 Console.WriteLine("Press a key followed by ENTER:");
4 ch = (char)Console.Read(); // get a char
5 Console.WriteLine("Your key is: " + ch);

```

Press a key followed by ENTER:  
Your key is:

? ถ้าพิมพ์ตัวอักษรจำนวนหลาย ๆ ตัว แล้วกด Enter จะได้ผลอย่างไร ทำไมจึงเป็นเช่นนั้น

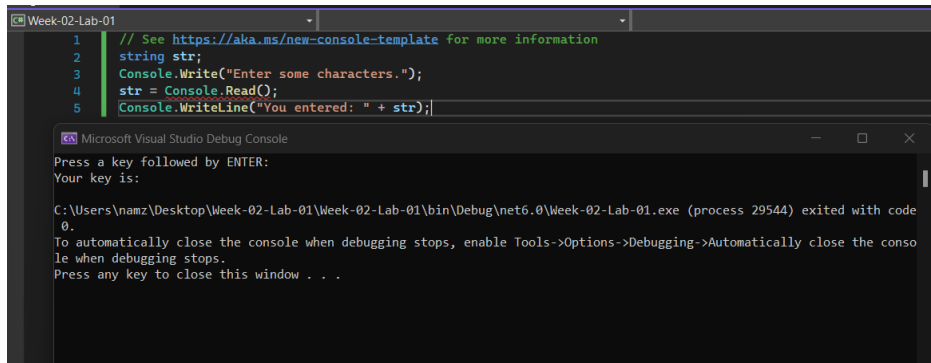
- ถ้าพิมพ์ตัวอักษรหลาย ๆ ตัว โปรแกรมจะแสดงผลแค่ตัวอักษรตัวแรก

? ในบรรทัดที่มีโปรแกรมเป็น `ch = (char)Console.Read();` นั้น ถ้าตัด `(char)` ออกไป จะเกิดอะไรขึ้น ให้อธิบายประกอบ

- โปรแกรมเกิดการ error และไม่สามารถนำ char ออกได้



## 10. การรับ string จากคีย์บอร์ด



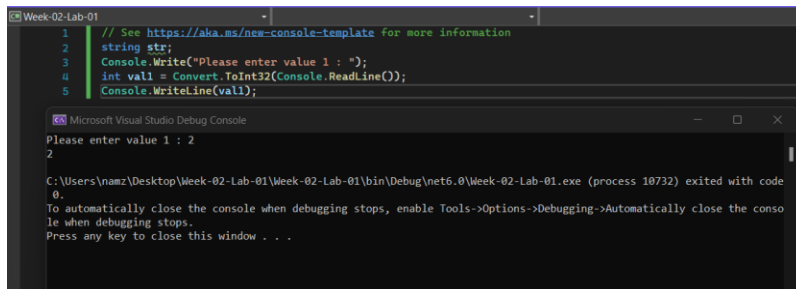
```
1 // See https://aka.ms/new-console-template for more information
2 string str;
3 Console.Write("Enter some characters.");
4 str = Console.ReadLine();
5 Console.WriteLine("You entered: " + str);
```

Microsoft Visual Studio Debug Console

Press a key followed by ENTER:  
Your key is:

C:\Users\namz\Desktop\Week-02-Lab-01\Week-02-Lab-01\bin\Debug\net6.0\Week-02-Lab-01.exe (process 29544) exited with code 0.  
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.  
Press any key to close this window . . .

## 11. การรับค่าตัวเลขจากคีย์บอร์ด



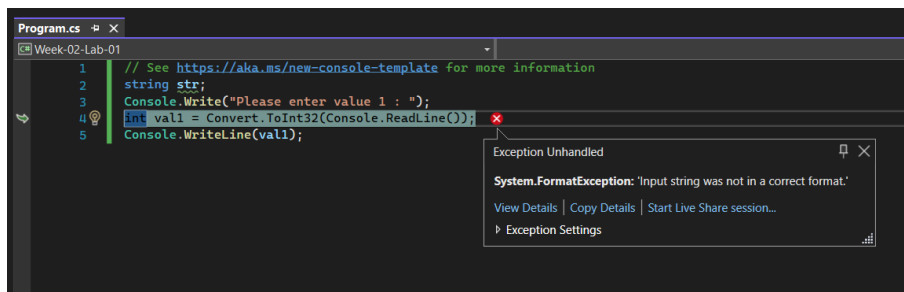
```
1 // See https://aka.ms/new-console-template for more information
2 string str;
3 Console.Write("Please enter value 1 : ");
4 int val1 = Convert.ToInt32(Console.ReadLine());
5 Console.WriteLine(val1);
```

Microsoft Visual Studio Debug Console

Please enter value 1 : 2  
2

C:\Users\namz\Desktop\Week-02-Lab-01\Week-02-Lab-01\bin\Debug\net6.0\Week-02-Lab-01.exe (process 10732) exited with code 0.  
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.  
Press any key to close this window . . .

? ถ้าเราป้อนตัวอักษรลงไปแทนที่ตัวเลข จะเกิดอะไรขึ้น มีวิธีการป้องกันหรือแก้ไขอย่างไร



```
1 // See https://aka.ms/new-console-template for more information
2 string str;
3 Console.Write("Please enter value 1 : ");
4 int val1 = Convert.ToInt32(Console.ReadLine());
5 Console.WriteLine(val1);
```

Exception Unhandled

**System.FormatException:** 'Input string was not in a correct format.'

View Details | Copy Details | Start Live Share session...

Exception Settings

- เมื่อป้อนตัวอักษรลงไปโปรแกรมจะ error เพราะค่าที่เราใส่ลงไปเป็น ค่าintใช้สำหรับป้อนตัวเลข

## 12. การรับค่าตัวเลขจากคีย์บอร์ด (ป้องกันโดยใช้ประโยค try{...} catch{...})

รันโปรแกรม โดยป้อนตัวเลขใดๆ และบันทึกผล

```
Week-02-Lab-01
1 // See https://aka.ms/new-console-template for more information
2 try
3 {
4     Console.WriteLine("Please enter value 1 :");
5     int val1 = Convert.ToInt32(Console.ReadLine());
6     Console.WriteLine("Please enter value 2 :");
7     int val2 = Convert.ToInt32(Console.ReadLine());
8     Console.WriteLine("Answer = " + (val1 + val2));
9 }
10 catch (Exception e)
11 {
12     Console.WriteLine("Error : " + e.ToString());
13 }
```

Microsoft Visual Studio Debug Console

Please enter value 1 :3  
Please enter value 2 :5  
Answer = 8

C:\Users\namz\Desktop\Week-02-Lab-01\Week-02-Lab-01\bin\Debug\net6.0\Week-02-Lab-01.exe (process 22816) exited with code 0.  
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.  
Press any key to close this window . . .

? ถ้าเราป้อนตัวอักษรลงไปแทนที่ตัวเลข จะเกิดอะไรขึ้น เหมือนหรือต่างจากโปรแกรมก่อนหน้านี้อย่างไร

```
Week-02-Lab-01
1 // See https://aka.ms/new-console-template for more information
2 try
3 {
4     Console.WriteLine("Please enter value 1 :");
5     int val1 = Convert.ToInt32(Console.ReadLine());
6     Console.WriteLine("Please enter value 2 :");
7     int val2 = Convert.ToInt32(Console.ReadLine());
8     Console.WriteLine("Answer = " + (val1 + val2));
9 }
10 catch (Exception e)
11 {
12     Console.WriteLine("Error : " + e.ToString());
13 }
```

Microsoft Visual Studio Debug Console

Please enter value 1 :h  
Error : System.FormatException: Input string was not in a correct format.  
at System.Number.ThrowOverflowOrFormatException(ParsingStatus status, TypeCode type)  
at System.Convert.ToInt32(String value)  
at Program.<Main>(String[] args) in C:\Users\namz\Desktop\Week-02-Lab-01\Week-02-Lab-01\Program.cs:line 5

C:\Users\namz\Desktop\Week-02-Lab-01\Week-02-Lab-01\bin\Debug\net6.0\Week-02-Lab-01.exe (process 27892) exited with code 0.  
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.  
Press any key to close this window . . .

- เมื่อป้อนตัวอักษรลงไปแทนตัวเลข โปรแกรม error

## การตั้งชื่อตัวแปรและชนิดข้อมูลในภาษา C#

ให้นักศึกษาพิจารณาชื่อตัวแปรตามตารางต่อไปนี้ ว่าสามารถใช้ได้หรือไม่ พร้อมบอกเหตุผล

ชื่อตัวแปร	ใช้ได้/ไม่ได้	เหตุผล
xxx	ใช้ได้	ไม่มีตัวอักษรที่ละเมิดกฎการตั้งชื่อ
null	ใช้ได้	ไม่มีตัวอักษรที่ละเมิดกฎการตั้งชื่อ
_value	ใช้ได้	ไม่มีตัวอักษรที่ละเมิดกฎการตั้งชื่อ
First-name	ใช้ไม่ได้	มีตัวอักษรที่ละเมิดกฎการตั้งชื่อ
Hello!	ใช้ไม่ได้	มีตัวอักษรที่ละเมิดกฎการตั้งชื่อ
w*h	ใช้ไม่ได้	มีตัวอักษรที่ละเมิดกฎการตั้งชื่อ
time	ใช้ได้	ไม่มีตัวอักษรที่ละเมิดกฎการตั้งชื่อ
do	ใช้ได้	ไม่มีตัวอักษรที่ละเมิดกฎการตั้งชื่อ
Do	ใช้ไม่ได้	มีตัวอักษรที่ละเมิดกฎการตั้งชื่อ
21November	ใช้ไม่ได้	มีตัวอักษรที่ละเมิดกฎการตั้งชื่อ
ladkrabang	ใช้ได้	ไม่มีตัวอักษรที่ละเมิดกฎการตั้งชื่อ
Student ID	ใช้ไม่ได้	มีตัวอักษรที่ละเมิดกฎการตั้งชื่อ

### 13. โปรแกรมแสดงคุณสมบัติ size, MinValue และ MaxValue ของชนิดข้อมูล

👉 คำสั่งสำหรับการทดลอง

ให้นักศึกษา เขียนโปรแกรมคล้ายกับตัวอย่างในข้อ 13 โดยมีชนิดข้อมูล

เป็น byte, char, bool, sbyte, short, ushort, uint, float, double, decimal, long และ ulong

ผลการทดลอง char

```
Week-02-Lab-01
1 // See https://aka.ms/new-console-template for more information
2 Console.WriteLine("Data type : char");
3 Console.WriteLine("Size : " + sizeof(char));
4 Console.WriteLine("Minimum Value : " + int.MinValue);
5 Console.WriteLine("Maximum Value : " + int.MaxValue);

Microsoft Visual Studio Debug Console
Data type : char
Size :2
Minimum Value : -2147483648
Maximum Value : 2147483647

C:\Users\namz\Desktop\Week-02-Lab-01\Week-02-Lab-01\bin\Debug\net6.0\Week-02-Lab-01.exe (process 0).
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .
```

ผลการทดลอง byte

```
Week-02-Lab-01
1 // See https://aka.ms/new-console-template for more information
2 Console.WriteLine("Data type : byte");
3 Console.WriteLine("Size : " + sizeof(byte));
4 Console.WriteLine("Minimum Value : " + int.MinValue);
5 Console.WriteLine("Maximum Value : " + int.MaxValue);

Microsoft Visual Studio Debug Console
Data type : byte
Size :1
Minimum Value : -2147483648
Maximum Value : 2147483647

C:\Users\namz\Desktop\Week-02-Lab-01\Week-02-Lab-01\bin\Debug\net6.0\Week-02-Lab-01.exe (process 23012) exited with code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .
```

ผลการทดลอง short

```
Week-02-Lab-01
1 // See https://aka.ms/new-console-template for more information
2 Console.WriteLine("Data type : short");
3 Console.WriteLine("Size : " + sizeof(short));
4 Console.WriteLine("Minimum Value : " + int.MinValue);
5 Console.WriteLine("Maximum Value : " + int.MaxValue);

Microsoft Visual Studio Debug Console
Data type : short
Size :2
Minimum Value : -2147483648
Maximum Value : 2147483647

C:\Users\namz\Desktop\Week-02-Lab-01\Week-02-Lab-01\bin\Debug\net6.0\Week-02-Lab-01.exe (process 17952) exited with code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .
```

ผลการทดลอง ushort

```
Week-02-Lab-01
1 // See https://aka.ms/new-console-template for more information
2 Console.WriteLine("Data type : ushort");
3 Console.WriteLine("Size : " + sizeof(ushort));
4 Console.WriteLine("Minimum Value : " + int.MinValue);
5 Console.WriteLine("Maximum Value : " + int.MaxValue);

Microsoft Visual Studio Debug Console
Data type : ushort
Size : 2
Minimum Value : -2147483648
Maximum Value : 2147483647

C:\Users\namz\Desktop\Week-02-Lab-01\Week-02-Lab-01\bin\Debug\net6.0\Week-02-Lab-01.exe (process 29000) exited with code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .
```

## ผลการทดลอง uint

```
Week-02-Lab-01
1 // See https://aka.ms/new-console-template for more information
2 Console.WriteLine("Data type : uint");
3 Console.WriteLine("Size : " + sizeof(uint));
4 Console.WriteLine("Minimum Value : " + int.MinValue);
5 Console.WriteLine("Maximum Value : " + int.MaxValue);

Microsoft Visual Studio Debug Console
Data type : uint
Size : 4
Minimum Value : -2147483648
Maximum Value : 2147483647

C:\Users\namz\Desktop\Week-02-Lab-01\Week-02-Lab-01\bin\Debug\net6.0\Week-02-Lab-01.exe (process 14996) exited with code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .
```

## ผลการทดลอง float

```
Week-02-Lab-01
1 // See https://aka.ms/new-console-template for more information
2 Console.WriteLine("Data type : float");
3 Console.WriteLine("Size : " + sizeof(float));
4 Console.WriteLine("Minimum Value : " + int.MinValue);
5 Console.WriteLine("Maximum Value : " + int.MaxValue);

Microsoft Visual Studio Debug Console
Data type : float
Size : 4
Minimum Value : -2147483648
Maximum Value : 2147483647

C:\Users\namz\Desktop\Week-02-Lab-01\Week-02-Lab-01\bin\Debug\net6.0\Week-02-Lab-01.exe (process 11576) exited with code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .
```

## ผลการทดลอง double

```
Week-02-Lab-01
1 // See https://aka.ms/new-console-template for more information
2 Console.WriteLine("Data type : double");
3 Console.WriteLine("Size : " + sizeof(double));
4 Console.WriteLine("Minimum Value : " + int.MinValue);
5 Console.WriteLine("Maximum Value : " + int.MaxValue);

Microsoft Visual Studio Debug Console
Data type : double
Size : 8
Minimum Value : -2147483648
Maximum Value : 2147483647

C:\Users\namz\Desktop\Week-02-Lab-01\Week-02-Lab-01\bin\Debug\net6.0\Week-02-Lab-01.exe (process 27424) exited with code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .
```

## ผลการทดลอง decimal

```
Week-02-Lab-01
1 // See https://aka.ms/new-console-template for more information
2 Console.WriteLine("Data type : decimal");
3 Console.WriteLine("Size : " + sizeof(decimal));
4 Console.WriteLine("Minimum Value : " + int.MinValue);
5 Console.WriteLine("Maximum Value : " + int.MaxValue);

Microsoft Visual Studio Debug Console
Data type : decimal
Size :16
Minimum Value : -2147483648
Maximum Value : 2147483647

C:\Users\namz\Desktop\Week-02-Lab-01\Week-02-Lab-01\bin\Debug\net6.0\Week-02-Lab-01.exe (process 15688) exited with code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .
```

## ผลการทดลอง long

```
Week-02-Lab-01
1 // See https://aka.ms/new-console-template for more information
2 Console.WriteLine("Data type : long");
3 Console.WriteLine("Size : " + sizeof(long));
4 Console.WriteLine("Minimum Value : " + int.MinValue);
5 Console.WriteLine("Maximum Value : " + int.MaxValue);

Microsoft Visual Studio Debug Console
Data type : long
Size :8
Minimum Value : -2147483648
Maximum Value : 2147483647

C:\Users\namz\Desktop\Week-02-Lab-01\Week-02-Lab-01\bin\Debug\net6.0\Week-02-Lab-01.exe (process 25148) exited with code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .
```

## ผลการทดลอง ulong

```
Week-02-Lab-01
1 // See https://aka.ms/new-console-template for more information
2 Console.WriteLine("Data type : ulong");
3 Console.WriteLine("Size : " + sizeof(ulong));
4 Console.WriteLine("Minimum Value : " + int.MinValue);
5 Console.WriteLine("Maximum Value : " + int.MaxValue);

Microsoft Visual Studio Debug Console
Data type : ulong
Size :8
Minimum Value : -2147483648
Maximum Value : 2147483647

C:\Users\namz\Desktop\Week-02-Lab-01\Week-02-Lab-01\bin\Debug\net6.0\Week-02-Lab-01.exe (process 29068) exited with code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .
```

## ผลการทดลอง bool

```
Week-02-Lab-01
1 // See https://aka.ms/new-console-template for more information
2 Console.WriteLine("Data type : bool");
3 Console.WriteLine("Size : " + sizeof(bool));
4 Console.WriteLine("Minimum Value : " + int.MinValue);
5 Console.WriteLine("Maximum Value : " + int.MaxValue);

Microsoft Visual Studio Debug Console
Data type : bool
Size :1
Minimum Value : -2147483648
Maximum Value : 2147483647

C:\Users\namz\Desktop\Week-02-Lab-01\Week-02-Lab-01\bin\Debug\net6.0\Week-02-Lab-01.exe (process 19028) exited with code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .
```

## ผลการทดลอง sbyte

```
Week-02-Lab-01
1 // See https://aka.ms/new-console-template for more information
2 Console.WriteLine("Data type : sbyte");
3 Console.WriteLine("Size : " + sizeof(sbyte));
4 Console.WriteLine("Minimum Value : " + int.MinValue);
5 Console.WriteLine("Maximum Value : " + int.MaxValue);
```

```
Microsoft Visual Studio Debug Console
Data type : sbyte
Size : 1
Minimum Value : -2147483648
Maximum Value : 2147483647

C:\Users\namz\Desktop\Week-02-Lab-01\Week-02-Lab-01\bin\Debug\net6.0\Week-02-Lab-01.exe (process 12884) exited with code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .
```

## สนุกกับการสร้างตัวเลขสุ่ม

## ให้รัน 10 ครั้งแล้วบันทึกค่าที่ได้จากการรัน

```
Week-02-Lab-01
1 // See https://aka.ms/new-console-template for more information
2 Random random = new Random();
3 int randomNumber = random.Next(0, 100);
4 Console.WriteLine(randomNumber);
```

```
Microsoft Visual Studio Debug Console
72

C:\Users\namz\Desktop\Week-02-Lab-01\Week-02-Lab-01\bin\Debug\net6.0\Week-02-Lab-01.exe (process 20240) exited with code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .
```

## 14. การเขียนโปรแกรมด้วยตัวดำเนินการทางตรรกะ

```
ตัวอย่างภาษา C# ต่อไปนี้เป็นกรณีพิพาทความจริงออกจากหน้าจอ 🙌 ให้เขียนโปรแกรมต่อไปนี้
```


```
bool A, B, Y;
Console.WriteLine("      Y = A AND B");
Console.WriteLine("-----");
Console.WriteLine("  A      B\t|  Y");
Console.WriteLine("-----");
A = false; B = false; Y = A & B;
Console.WriteLine(" {0}\t{1}\t| {2}", A, B, Y);
A = false; B = true; Y = A & B;
Console.WriteLine(" {0}\t{1}\t| {2}", A, B, Y);
A = true; B = false; Y = A & B;
Console.WriteLine(" {0}\t{1}\t| {2}", A, B, Y);
A = true; B = true; Y = A & B;
Console.WriteLine(" {0}\t{1}\t| {2}", A, B, Y);
Console.WriteLine("-----");
```

```

1 // See https://aka.ms/new-console-template for more information
2 bool A, B, Y;
3 Console.WriteLine("    Y = A AND B");
4 Console.WriteLine("-----");
5 Console.WriteLine("  A    B\t|  Y");
6 Console.WriteLine("-----");
7 A = false; B = false; Y = A & B;
8 Console.WriteLine(" {0}\t{1}\t| {2}", A, B, Y);
9 A = false; B = true; Y = A & B;
10 Console.WriteLine(" {0}\t{1}\t| {2}", A, B, Y);
11 A = true; B = false; Y = A & B;
12 Console.WriteLine(" {0}\t{1}\t| {2}", A, B, Y);
13 A = true; B = true; Y = A & B;
14 Console.WriteLine(" {0}\t{1}\t| {2}", A, B, Y);
15 Console.WriteLine("-----");

```

A	B	Y
False	False	False
False	True	False
True	False	False
True	True	True

 จากข้อ 14 ให้เขียนโปรแกรมเพื่อสร้างตารางความจริงของลอจิกดังต่อไปนี้

## 1.AND

```

1 // See https://aka.ms/new-console-template for more information
2 bool A, B, Y;
3 Console.WriteLine("    Y = A AND B");
4 Console.WriteLine("-----");
5 Console.WriteLine("  A    B\t|  Y");
6 Console.WriteLine("-----");
7 A = false; B = false; Y = A & B;
8 Console.WriteLine(" {0}\t{1}\t| {2}", A, B, Y);
9 A = false; B = true; Y = A & B;
10 Console.WriteLine(" {0}\t{1}\t| {2}", A, B, Y);
11 A = true; B = false; Y = A & B;
12 Console.WriteLine(" {0}\t{1}\t| {2}", A, B, Y);
13 A = true; B = true; Y = A & B;
14 Console.WriteLine(" {0}\t{1}\t| {2}", A, B, Y);
15 Console.WriteLine("-----");

```

A	B	Y
False	False	False
False	True	False
True	False	False
True	True	True

## 2.OR

```

1 // See https://aka.ms/new-console-template for more information
2 bool A, B, Y;
3 Console.WriteLine("    Y = A OR B");
4 Console.WriteLine("-----");
5 Console.WriteLine("  A    B\t|  Y");
6 Console.WriteLine("-----");
7 A = false; B = false; Y = A || B;
8 Console.WriteLine(" {0}\t{1}\t| {2}", A, B, Y);
9 A = false; B = true; Y = A || B;
10 Console.WriteLine(" {0}\t{1}\t| {2}", A, B, Y);
11 A = true; B = false; Y = A || B;
12 Console.WriteLine(" {0}\t{1}\t| {2}", A, B, Y);
13 A = true; B = true; Y = A || B;
14 Console.WriteLine(" {0}\t{1}\t| {2}", A, B, Y);
15 Console.WriteLine("-----");

```

A	B	Y
False	False	False
False	True	True
True	False	True
True	True	True

## 3.NOT



```

1 // See https://aka.ms/new-console-template for more information
2 bool A, B, Y;
3 Console.WriteLine("      Y = A NOT B");
4 Console.WriteLine("-----");
5 Console.WriteLine(" A      B\t| Y");
6 Console.WriteLine("-----");
7 A = false; B = false; Y = A != B;
8 Console.WriteLine(" {0}\t{1}\t| {2}", A, B, Y);
9 A = false; B = true; Y = A != B;
10 Console.WriteLine(" {0}\t{1}\t| {2}", A, B, Y);
11 A = true; B = false; Y = A != B;
12 Console.WriteLine(" {0}\t{1}\t| {2}", A, B, Y);
13 A = true; B = true; Y = A != B;
14 Console.WriteLine(" {0}\t{1}\t| {2}", A, B, Y);
15 Console.WriteLine("-----");

```

Microsoft Visual Studio Debug Console

Y = A NOT B

A	B	Y
False	False	False
False	True	True
True	False	True
True	True	False

C:\Users\namz\Desktop\Week-02-Lab-01\Week-02-Lab-01\bin\Debug\net6.0\Week-02-Lab-01.exe (process 0).  
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close when debugging stops.  
Press any key to close this window . . .

## 4.NAND

```

1 // See https://aka.ms/new-console-template for more information
2 bool A, B, Y;
3 Console.WriteLine("      Y = A NAND B");
4 Console.WriteLine("-----");
5 Console.WriteLine(" A      B\t| Y");
6 Console.WriteLine("-----");
7 A = false; B = false; Y = A && B;
8 Console.WriteLine(" {0}\t{1}\t| {2}", A, B, Y);
9 A = false; B = true; Y = A && B;
10 Console.WriteLine(" {0}\t{1}\t| {2}", A, B, Y);
11 A = true; B = false; Y = A && B;
12 Console.WriteLine(" {0}\t{1}\t| {2}", A, B, Y);
13 A = true; B = true; Y = A && B;
14 Console.WriteLine(" {0}\t{1}\t| {2}", A, B, Y);
15 Console.WriteLine("-----");

```

Microsoft Visual Studio Debug Console

Y = A NAND B

A	B	Y
False	False	False
False	True	False
True	False	False
True	True	True

C:\Users\namz\Desktop\Week-02-Lab-01\Week-02-Lab-01\bin\Debug\net6.0\Week-02-Lab-01.exe (process 0).  
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close when debugging stops.  
Press any key to close this window . . .

## 5.NOR

```

1 // See https://aka.ms/new-console-template for more information
2 bool A, B, Y;
3 Console.WriteLine("      Y = A NOR B");
4 Console.WriteLine("-----");
5 Console.WriteLine(" A      B\t| Y");
6 Console.WriteLine("-----");
7 A = false; B = false; Y = A == B;
8 Console.WriteLine(" {0}\t{1}\t| {2}", A, B, Y);
9 A = false; B = true; Y = A == B;
10 Console.WriteLine(" {0}\t{1}\t| {2}", A, B, Y);
11 A = true; B = false; Y = A == B;
12 Console.WriteLine(" {0}\t{1}\t| {2}", A, B, Y);
13 A = true; B = true; Y = A == B;
14 Console.WriteLine(" {0}\t{1}\t| {2}", A, B, Y);
15 Console.WriteLine("-----");

```

Microsoft Visual Studio Debug Console

Y = A NOR B

A	B	Y
False	False	False
False	True	True
True	False	True
False	True	False

C:\Users\namz\Desktop\Week-02-Lab-01\Week-02-Lab-01\bin\Debug\net6.0\Week-02-Lab-01.exe (process 1586).  
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close when debugging stops.  
Press any key to close this window . . .

## 6.Exclusive OR

```

1 // See https://aka.ms/new-console-template for more information
2 bool A, B, Y;
3 Console.WriteLine("      Y = A Exclusive OR B");
4 Console.WriteLine("-----");
5 Console.WriteLine(" A      B\t| Y");
6 Console.WriteLine("-----");
7 A = false; B = false; Y = A ^ B;
8 Console.WriteLine(" {0}\t{1}\t| {2}", A, B, Y);
9 A = false; B = true; Y = A ^ B;
10 Console.WriteLine(" {0}\t{1}\t| {2}", A, B, Y);
11 A = true; B = false; Y = A ^ B;
12 Console.WriteLine(" {0}\t{1}\t| {2}", A, B, Y);
13 A = true; B = true; Y = A ^ B;
14 Console.WriteLine(" {0}\t{1}\t| {2}", A, B, Y);
15 Console.WriteLine("-----");

```

Microsoft Visual Studio Debug Console

Y = A Exclusive OR B

A	B	Y
False	False	False
False	True	True
True	False	True
True	True	False

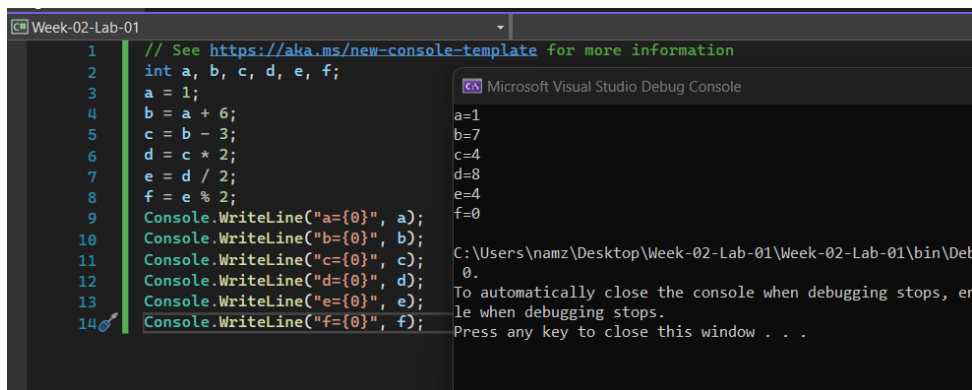
C:\Users\namz\Desktop\Week-02-Lab-01\Week-02-Lab-01\bin\Debug\net6.0\Week-02-Lab-01.exe (process 1586).  
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close when debugging stops.  
Press any key to close this window . . .

## ชนิดข้อมูลตัวเลขจำนวนเต็ม (Integer Types)

### 15. การใช้เครื่องหมายทางคณิตศาสตร์กับตัวแปรชนิดจำนวนเต็ม

👉 ให้เขียนโปรแกรมต่อไปนี้

```
int a, b, c, d, e, f;
a = 1;
b = a + 6;
c = b - 3;
d = c * 2;
e = d / 2;
f = e % 2;
Console.WriteLine("a={0}", a);
Console.WriteLine("b={0}", b);
Console.WriteLine("c={0}", c);
Console.WriteLine("d={0}", d);
Console.WriteLine("e={0}", e);
Console.WriteLine("f={0}", f);
```



```
1 // See https://aka.ms/new-console-template for more information
2 int a, b, c, d, e, f;
3 a = 1;
4 b = a + 6;
5 c = b - 3;
6 d = c * 2;
7 e = d / 2;
8 f = e % 2;
9 Console.WriteLine("a={0}", a);
10 Console.WriteLine("b={0}", b);
11 Console.WriteLine("c={0}", c);
12 Console.WriteLine("d={0}", d);
13 Console.WriteLine("e={0}", e);
14 Console.WriteLine("f={0}", f);
```

Microsoft Visual Studio Debug Console

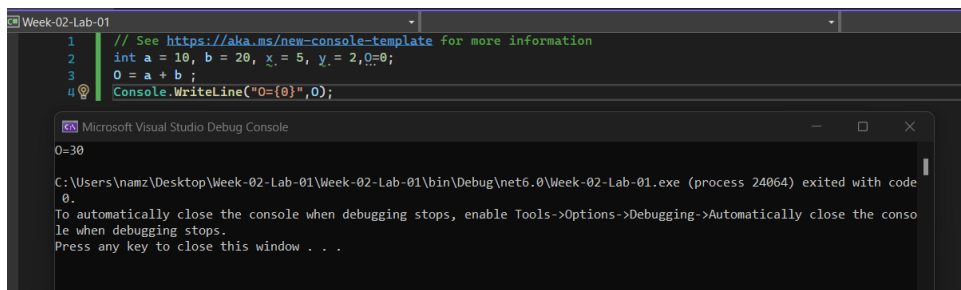
a=1  
b=7  
c=4  
d=8  
e=4  
f=0

C:\Users\namz\Desktop\Week-02-Lab-01\Week-02-Lab-01\bin\Debug\net6.0\Week-02-Lab-01.exe (process 24064) exited with code 0.  
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.  
Press any key to close this window . . .

### 16. หาค่าจากสมการทางคณิตศาสตร์

กำหนด ``a = 10, b = 20, x = 5, y = 2`` 👉 ให้เขียนโปรแกรมเพื่อหาผลลัพธ์ของสมการต่อไปนี้

1.a+b



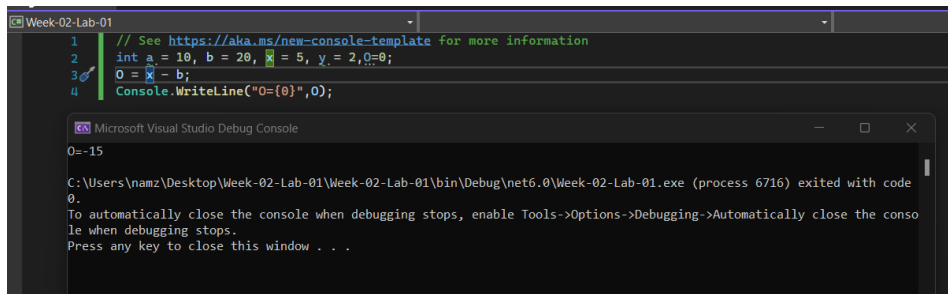
```
1 // See https://aka.ms/new-console-template for more information
2 int a = 10, b = 20, x = 5, y = 2;
3 0 = a + b;
4 Console.WriteLine("0={0}", 0);
```

Microsoft Visual Studio Debug Console

0=30

C:\Users\namz\Desktop\Week-02-Lab-01\Week-02-Lab-01\bin\Debug\net6.0\Week-02-Lab-01.exe (process 24064) exited with code 0.  
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.  
Press any key to close this window . . .

2.x-b

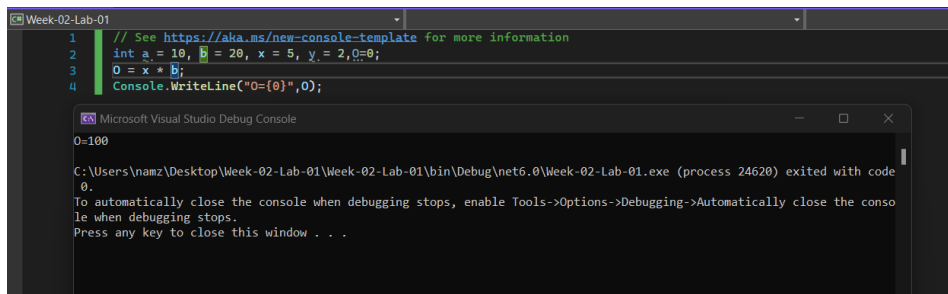


```
1 // See https://aka.ms/new-console-template for more information
2 int a = 10, b = 20, x = 5, y = 2, z = 0;
3 x = a - b;
4 Console.WriteLine("0={0}", 0);
```

0=-15

C:\Users\namz\Desktop\Week-02-Lab-01\Week-02-Lab-01\bin\Debug\net6.0\Week-02-Lab-01.exe (process 6716) exited with code 0.  
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.  
Press any key to close this window . . .

3.x\*b

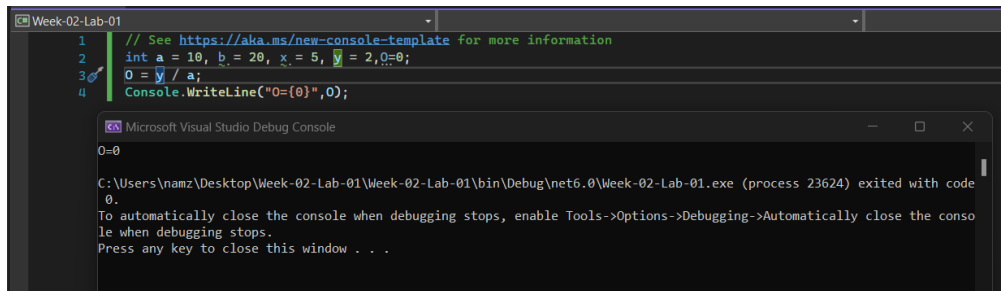


```
1 // See https://aka.ms/new-console-template for more information
2 int a = 10, b = 20, x = 5, y = 2, z = 0;
3 x = a * b;
4 Console.WriteLine("0={0}", 0);
```

0=100

C:\Users\namz\Desktop\Week-02-Lab-01\Week-02-Lab-01\bin\Debug\net6.0\Week-02-Lab-01.exe (process 24620) exited with code 0.  
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.  
Press any key to close this window . . .

4.y/a

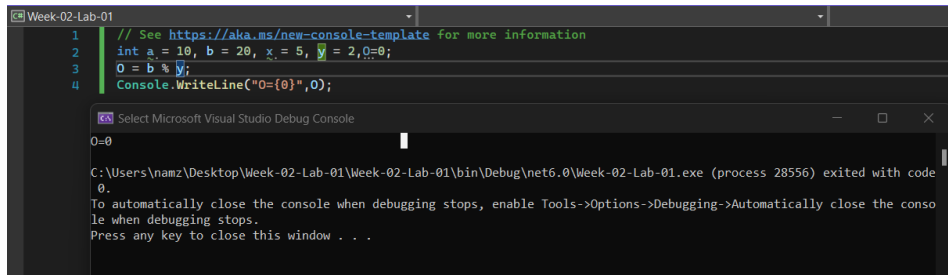


```
1 // See https://aka.ms/new-console-template for more information
2 int a = 10, b = 20, x = 5, y = 2, z = 0;
3 x = y / a;
4 Console.WriteLine("0={0}", 0);
```

0=0

C:\Users\namz\Desktop\Week-02-Lab-01\Week-02-Lab-01\bin\Debug\net6.0\Week-02-Lab-01.exe (process 23624) exited with code 0.  
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.  
Press any key to close this window . . .

5.b%y



```
1 // See https://aka.ms/new-console-template for more information
2 int a = 10, b = 20, x = 5, y = 2, z = 0;
3 x = b % y;
4 Console.WriteLine("0={0}", 0);
```

0=0

C:\Users\namz\Desktop\Week-02-Lab-01\Week-02-Lab-01\bin\Debug\net6.0\Week-02-Lab-01.exe (process 28556) exited with code 0.  
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.  
Press any key to close this window . . .

6.y+10%x

The screenshot shows a Visual Studio window titled "Week-02-Lab-01" with a C# code file. The code is as follows:

```
1 // See https://aka.ms/new-console-template for more information
2 int a = 10, b = 20, x = 5, y = 2, z = 0;
3 z = y + 10 % x;
4 Console.WriteLine("0={0}", z);
```

The output window, titled "Microsoft Visual Studio Debug Console", shows the result: "0=2". Below the output, it states: "C:\Users\namz\Desktop\Week-02-Lab-01\Week-02-Lab-01\bin\Debug\net6.0\Week-02-Lab-01.exe (process 19472) exited with code 0. To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops. Press any key to close this window . . ."

$$7.a/3*5$$

The screenshot shows a Visual Studio window titled "Week-02-Lab-01" with a C# code file. The code is as follows:

```
1 // See https://aka.ms/new-console-template for more information
2 int a = 10, b = 20, x = 5, y = 2, z = 0;
3 z = a / 3 * 5;
4 Console.WriteLine("0={0}", z);
```

The output window, titled "Select Microsoft Visual Studio Debug Console", shows the result: "0=15". Below the output, it states: "C:\Users\namz\Desktop\Week-02-Lab-01\Week-02-Lab-01\bin\Debug\net6.0\Week-02-Lab-01.exe (process 28644) exited with code 0. To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops. Press any key to close this window . . ."

$$8.9/2*a$$

The screenshot shows a Visual Studio window titled "Week-02-Lab-01" with a C# code file. The code is as follows:

```
1 // See https://aka.ms/new-console-template for more information
2 int a = 10, b = 20, x = 5, y = 2, z = 0;
3 z = 9 / 2 * a;
4 Console.WriteLine("0={0}", z);
```

The output window, titled "Microsoft Visual Studio Debug Console", shows the result: "0=40". Below the output, it states: "C:\Users\namz\Desktop\Week-02-Lab-01\Week-02-Lab-01\bin\Debug\net6.0\Week-02-Lab-01.exe (process 25708) exited with code 0. To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops. Press any key to close this window . . ."

$$9.y\%8$$

The screenshot shows a Visual Studio window titled "Week-02-Lab-01" with a C# code file. The code is as follows:

```
1 // See https://aka.ms/new-console-template for more information
2 int a = 10, b = 20, x = 5, y = 2, z = 0;
3 z = y % 8;
4 Console.WriteLine("0={0}", z);
```

The output window, titled "Microsoft Visual Studio Debug Console", shows the result: "0=2". Below the output, it states: "C:\Users\namz\Desktop\Week-02-Lab-01\Week-02-Lab-01\bin\Debug\net6.0\Week-02-Lab-01.exe (process 28932) exited with code 0. To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops. Press any key to close this window . . ."

$$10.100*x+y\%2-a$$

```
Week-02-Lab-01
1 // See https://aka.ms/new-console-template for more information
2 int a = 10, b = 20, x = 5, y = 2, z = 0;
3 0 = 100 * x + y % 2 - a;
4 Console.WriteLine("0={0}",0);

Microsoft Visual Studio Debug Console
0=490

C:\Users\namz\Desktop\Week-02-Lab-01\Week-02-Lab-01\bin\Debug\net6.0\Week-02-Lab-01.exe (process 26392) exited with code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .
```

## 17. โปรแกรมคำนวณระยะทางและเวลาของแสงจากดวงอาทิตย์ถึงโลก

👉 ให้เขียนโปรแกรมต่อไปนี้

```
const double lightSpeed = 186000d; // miles per second
Console.WriteLine("Light speed = {0} Mile Per second", lightSpeed);
const double mileToKm = 1.609344;
Console.WriteLine("Light speed = {0} km Per second", lightSpeed*mileToKm);
const double SunToEarthDistance = 93000000d ; // miles
Console.WriteLine("SunToEarthDistance = {0} km", SunToEarthDistance * mileToKm);
double SunToEarthTimeOfLight = SunToEarthDistance / lightSpeed; // miles
Console.WriteLine("SunToEarthTimeOfLight = {0} seconds", SunToEarthTimeOfLight);
Console.WriteLine("SunToEarthTimeOfLight = {0} minutes", SunToEarthTimeOfLight/60d);
```

```
Week-02-Lab-01
1 // See https://aka.ms/new-console-template for more information
2 const double lightSpeed = 186000d; // miles per second
3 Console.WriteLine("Light speed = {0} Mile Per second", lightSpeed);
4 const double mileToKm = 1.609344;
5 Console.WriteLine("Light speed = {0} km Per second", lightSpeed * mileToKm);
6 const double SunToEarthDistance = 93000000d; // miles
7 Console.WriteLine("SunToEarthDistance = {0} km", SunToEarthDistance * mileToKm);
8 double SunToEarthTimeOfLight = SunToEarthDistance / lightSpeed; // miles
9 Console.WriteLine("SunToEarthTimeOfLight = {0} seconds", SunToEarthTimeOfLight);
10 Console.WriteLine("SunToEarthTimeOfLight = {0} minutes", SunToEarthTimeOfLight / 60d);

Microsoft Visual Studio Debug Console
Light speed = 186000 Mile Per second
Light speed = 299337.984 km Per second
SunToEarthDistance = 149600000 km
SunToEarthTimeOfLight = 500 seconds
SunToEarthTimeOfLight = 8.33333333333334 minutes

C:\Users\namz\Desktop\Week-02-Lab-01\Week-02-Lab-01\bin\Debug\net6.0\Week-02-Lab-01.exe (process 23952) exited with code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .
```



คำสั่ง ให้เขียนโปรแกรมคำนวณค่าเพื่อเติมลงในช่องว่างในตาราง ตารางที่ 1 ระยะทางจากดวงอาทิตย์ถึงดาวเคราะห์ต่าง ๆ

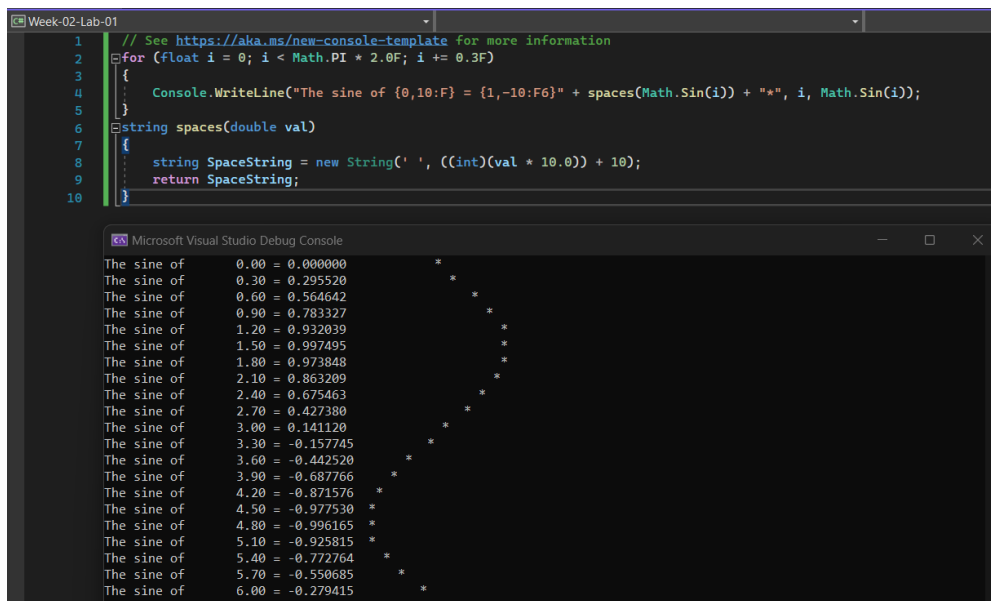
ดาวเคราะห์	ระยะทางจากดวงอาทิตย์	ระยะทางในหน่วย A.U.	เวลาของแสง (นาที่)
Mercury	57,910,000 km	311.3440860215054	5.189068100358424
Venus	108,200,000 km	581.7204301075269	9.695340501792115
Earth	149,600,000 km	804.3010752688172	13.405017921146953
Mars	227,940,000 km	1225.483870967742	20.4247311827957
Jupiter	778,330,000 km	4184.569892473119	69.74283154121865
Uranus	2,873,550,000 km	15449.193548387097	257.48655913978496
Neptune	4,501,000,000 km	24198.924731182797	403.31541218637994
Pluto	5,945,900,000 km	31967.204301075268	532.7867383512545

## 20. โปรแกรมพล็อตรูป sine wave บนหน้าจอ

👉 ให้เขียนโปรแกรมต่อไปนี้

```
for (float i = 0; i < Math.PI * 2.0F; i += 0.3F)
{
    Console.WriteLine("The sine of {0,10:F} = {1,-10:F6}" + spaces(Math.Sin(i)) + "*", i, Math.Sin(i));
}
string spaces(double val)
{
    string SpaceString = new String(' ', ((int)(val * 10.0)) + 10);
    return SpaceString;
}
```

➤ รันโปรแกรมและบันทึกผล



```
Week-02-Lab-01
1 // See https://aka.ms/new-console-template for more information
2 for (float i = 0; i < Math.PI * 2.0F; i += 0.3F)
3 {
4     Console.WriteLine("The sine of {0,10:F} = {1,-10:F6}" + spaces(Math.Sin(i)) + "*", i, Math.Sin(i));
5 }
6 string spaces(double val)
7 {
8     string SpaceString = new String(' ', ((int)(val * 10.0)) + 10);
9     return SpaceString;
10 }

Microsoft Visual Studio Debug Console
The sine of 0.00 = 0.000000 *
The sine of 0.30 = 0.295520 *
The sine of 0.60 = 0.564642 *
The sine of 0.90 = 0.783327 *
The sine of 1.20 = 0.932039 *
The sine of 1.50 = 0.997495 *
The sine of 1.80 = 0.973848 *
The sine of 2.10 = 0.863209 *
The sine of 2.40 = 0.675463 *
The sine of 2.70 = 0.427380 *
The sine of 3.00 = 0.141120 *
The sine of 3.30 = -0.157745 *
The sine of 3.60 = -0.442520 *
The sine of 3.90 = -0.687766 *
The sine of 4.20 = -0.871576 *
The sine of 4.50 = -0.977530 *
The sine of 4.80 = -0.996165 *
The sine of 5.10 = -0.925815 *
The sine of 5.40 = -0.772764 *
The sine of 5.70 = -0.550685 *
The sine of 6.00 = -0.279415 *
```