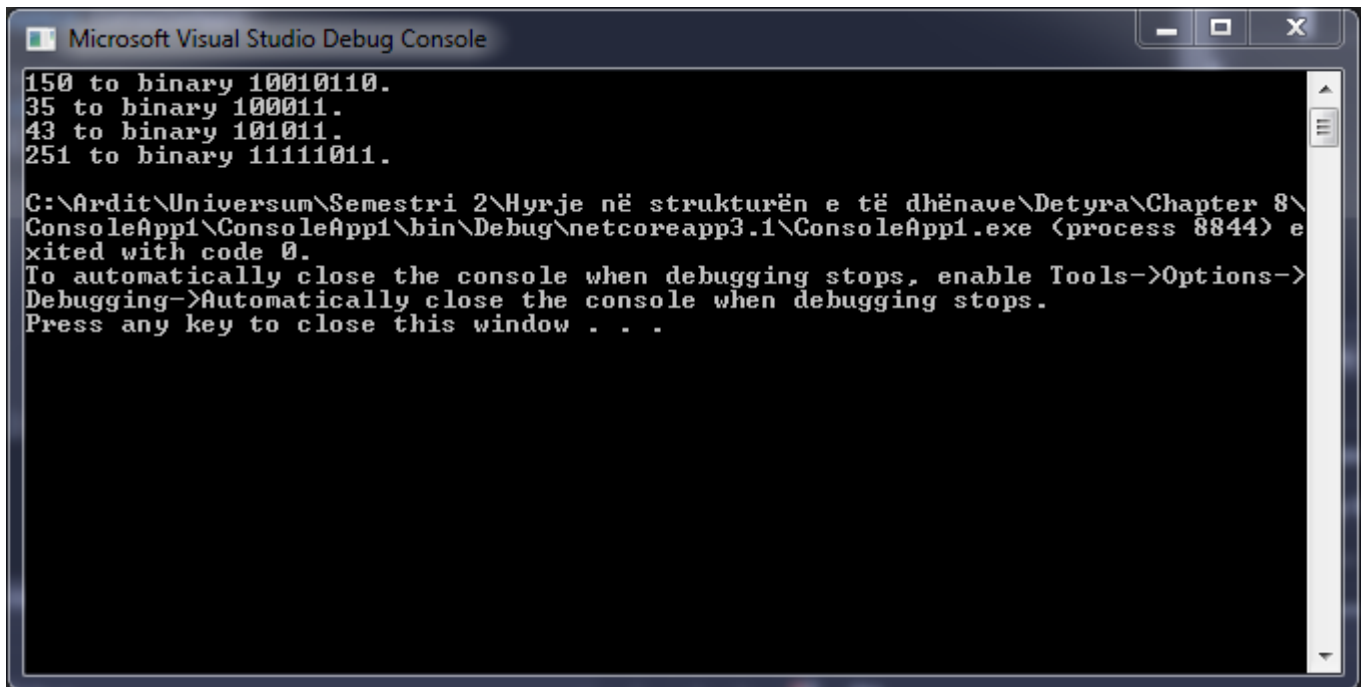


1. Convert the numbers 151, 35, 43, 251, 1023 and 1024 to the **binary numeral system**.

```
using System;
```

```
namespace ConsoleApp1
```

```
{  
    class Program  
    {  
        static void Main(string[] args)  
        {  
            Console.WriteLine("150 to binary {0}.", Convert.ToString(150, 2));  
            Console.WriteLine("35 to binary {0}.", Convert.ToString(35, 2));  
            Console.WriteLine("43 to binary {0}.", Convert.ToString(43, 2));  
            Console.WriteLine("251 to binary {0}.", Convert.ToString(251, 2));  
        }  
    }  
}
```



The screenshot shows the Microsoft Visual Studio Debug Console window. The title bar reads "Microsoft Visual Studio Debug Console". The console output displays the results of the program's execution, showing the decimal numbers and their corresponding binary representations. Below the output, a message indicates that the application has exited with code 0 and provides instructions on how to automatically close the console when debugging stops.

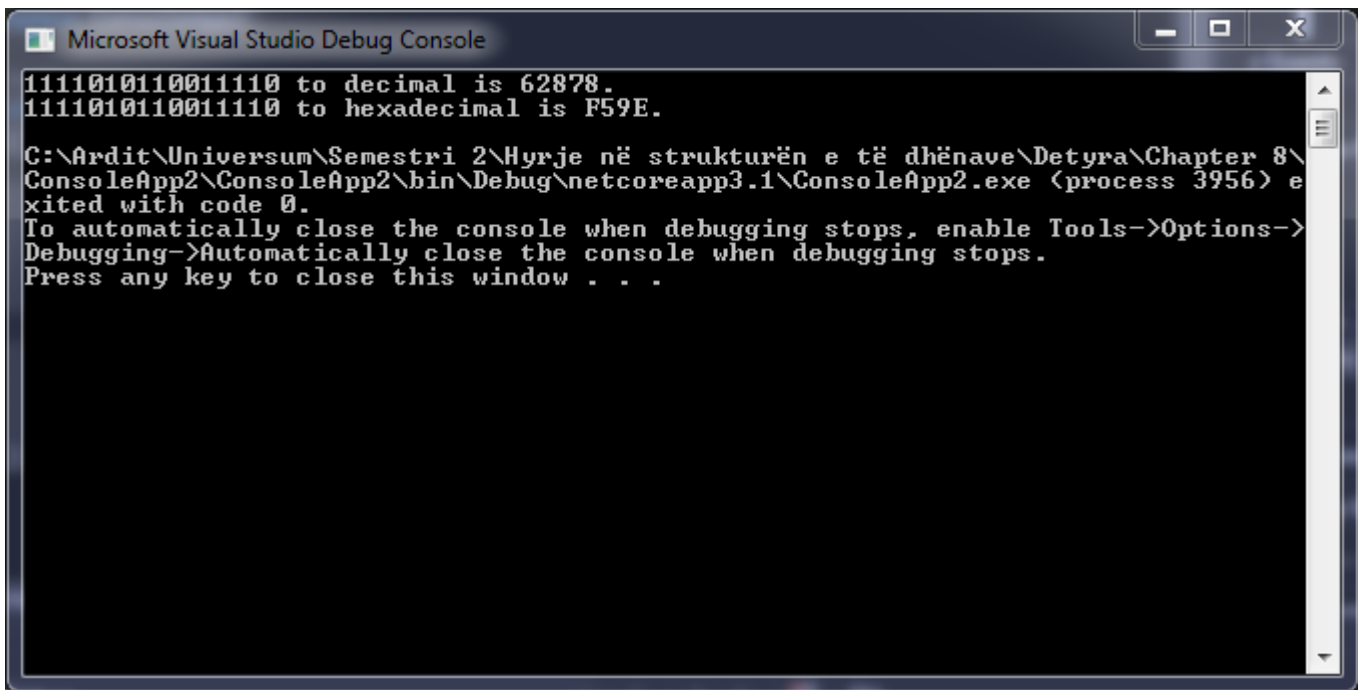
```
150 to binary 10010110.  
35 to binary 100011.  
43 to binary 101011.  
251 to binary 11111011.  
  
C:\Ardit\Universum\Semestri 2\Hyrje në strukturën e të dhënave\Detyra\Chapter 8\  
ConsoleApp1\ConsoleApp1\bin\Debug\netcoreapp3.1\ConsoleApp1.exe (process 8844) e  
xited with code 0.  
To automatically 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. Convert the number 1111010110011110(2) to **hexadecimal** and **decimal** numeral systems.

```
using System;
```

```
namespace ConsoleApp2
```

```
{  
    class Program  
    {  
        static void Main(string[] args)  
        {  
            Console.WriteLine("1111010110011110 to decimal is {0}.",  
                Convert.ToInt64("1111010110011110", 2));  
  
            Console.WriteLine("1111010110011110 to hexadecimal is {0}.",  
                Convert.ToInt64("1111010110011110", 2).ToString("X"));  
        }  
    }  
}
```



The screenshot shows the Microsoft Visual Studio Debug Console window. The title bar reads "Microsoft Visual Studio Debug Console". The console output is as follows:

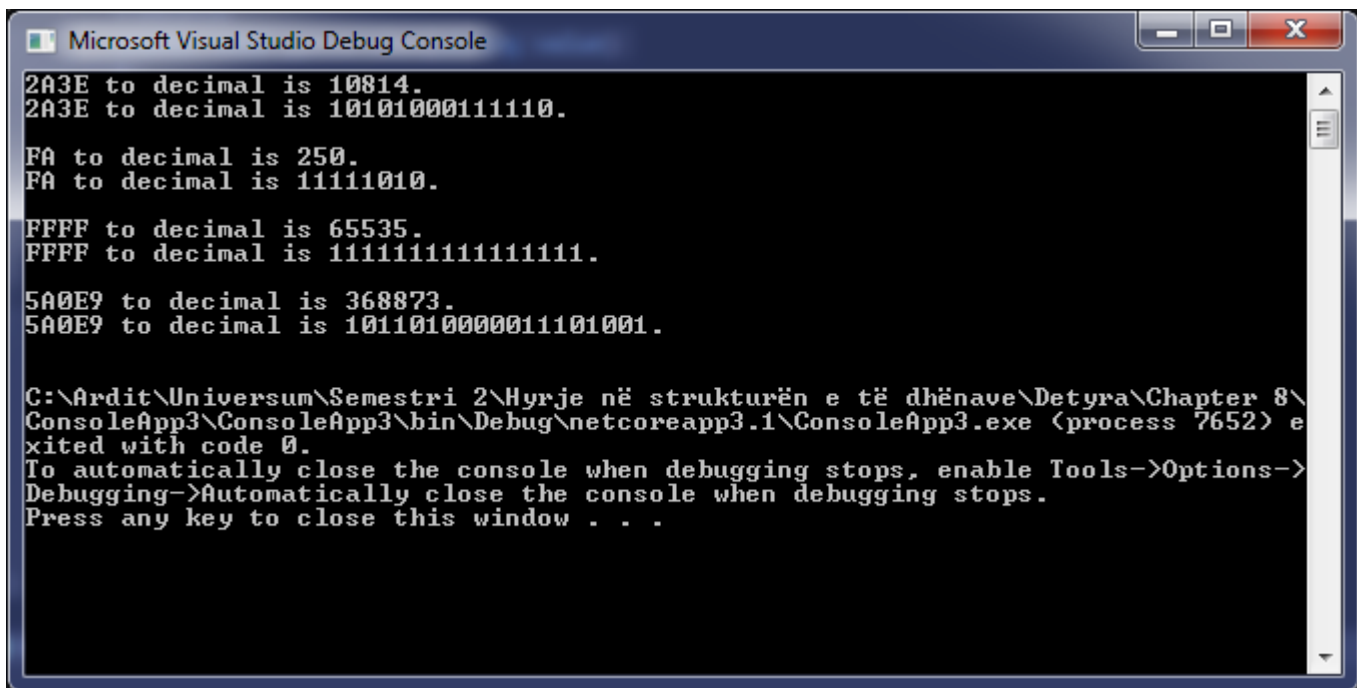
```
1111010110011110 to decimal is 62878.  
1111010110011110 to hexadecimal is F59E.  
  
C:\Ardit\Universum\Semestri 2\Hyrje në strukturën e të dhënave\Detyra\Chapter 8\  
ConsoleApp2\ConsoleApp2\bin\Debug\netcoreapp3.1\ConsoleApp2.exe (process 3956) e  
xited with code 0.  
To automatically close the console when debugging stops, enable Tools->Options->  
Debugging->Automatically close the console when debugging stops.  
Press any key to close this window . . .
```

3. Convert the hexadecimal numbers FA, 2A3E, FFFF, 5A0E9 to **binary** and **decimal** numeral systems.

```
using System;
```

```
namespace ConsoleApp3
```

```
{  
    class Program  
    {  
        static void conversion(string value)  
        {  
            Console.WriteLine("{0} to decimal is {1}.",  
                value, Convert.ToInt32(value, 16));  
            Console.WriteLine("{0} to decimal is {1}.\n", value,  
                Convert.ToString(Convert.ToInt32(value, 16), 2));  
        }  
  
        static void Main(string[] args)  
        {  
            conversion("2A3E");  
            conversion("FA");  
            conversion("FFFF");  
            conversion("5A0E9");  
        }  
    }  
}
```



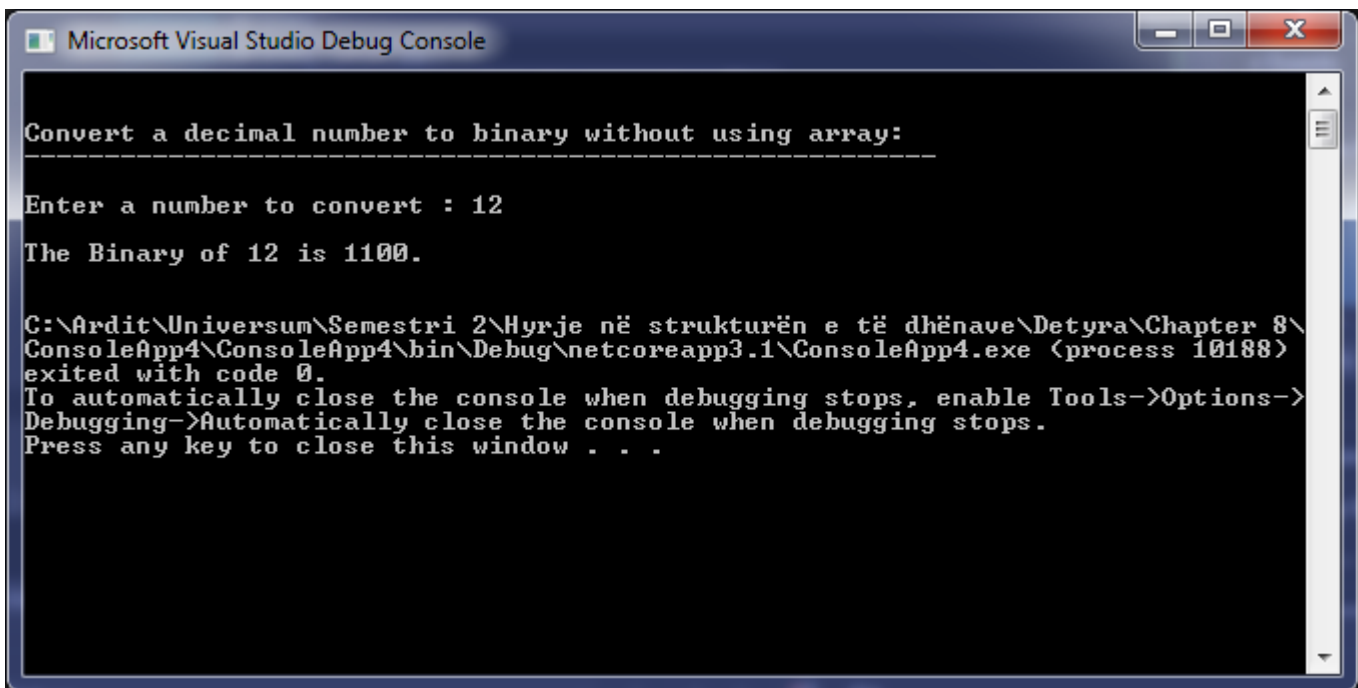
```
Microsoft Visual Studio Debug Console  
2A3E to decimal is 10814.  
2A3E to decimal is 10101000111110.  
  
FA to decimal is 250.  
FA to decimal is 11111010.  
  
FFFF to decimal is 65535.  
FFFF to decimal is 111111111111111.  
  
5A0E9 to decimal is 368873.  
5A0E9 to decimal is 1011010000011101001.  
  
C:\Ardit\Universum\Semestri 2\Hyrje në strukturën e të dhënave\Detyra\Chapter 8\  
ConsoleApp3\ConsoleApp3\bin\Debug\netcoreapp3.1\ConsoleApp3.exe (process 7652) e  
xited 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. Write a program that converts a **decimal number to binary one**.

```
using System;
```

```
namespace ConsoleApp4
```

```
{  
    class Program  
    {  
        public static void Main()  
        {  
            int n, i, j, binno = 0, dn;  
            Console.WriteLine("\n\n");  
            Console.WriteLine("Convert a decimal number to binary without using array:\n");  
            Console.WriteLine("-----");  
            Console.WriteLine("\n\n");  
            Console.WriteLine("Enter a number to convert : ");  
            n = Convert.ToInt32(Console.ReadLine());  
            dn = n;  
            i = 1;  
            for (j = n; j > 0; j = j / 2)  
            {  
                binno = binno + (n % 2) * i;  
                i = i * 10;  
                n = n / 2;  
            }  
  
            Console.WriteLine("\nThe Binary of {0} is {1}.\n\n", dn, binno);  
        }  
    }  
}
```

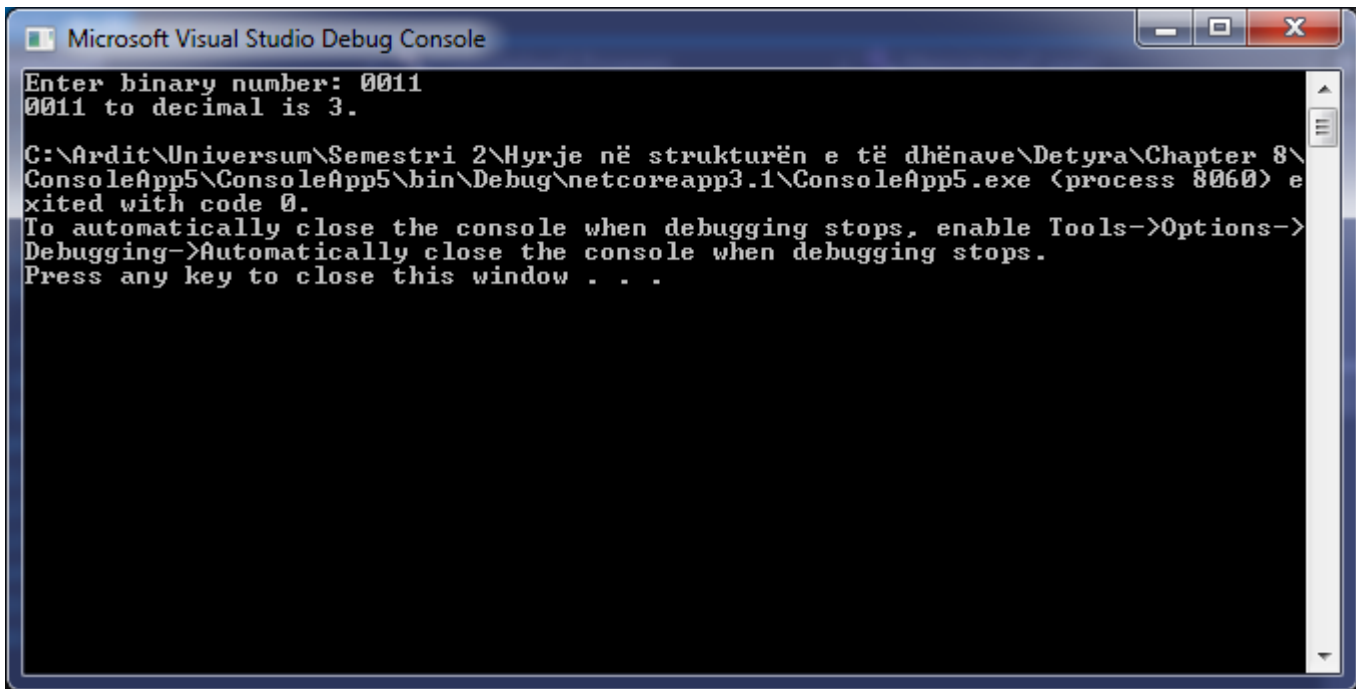


```
Microsoft Visual Studio Debug Console  
  
Convert a decimal number to binary without using array:  
-----  
  
Enter a number to convert : 12  
The Binary of 12 is 1100.  
  
C:\Ardit\Universum\Semestri 2\Hyrje në strukturën e të dhënave\Detyra\Chapter 8\  
ConsoleApp4\ConsoleApp4\bin\Debug\netcoreapp3.1\ConsoleApp4.exe (process 10188)  
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. Write a program that converts a **binary number to decimal one**

```
using System;

namespace ConsoleApp5
{
    class Program
    {
        static void Main(string[] args)
        {
            Console.Write("Enter binary number: ");
            string binary = Console.ReadLine();
            Console.WriteLine("{0} to decimal is {1}.",
                binary, Convert.ToInt64(binary, 2));
        }
    }
}
```



The screenshot shows the Microsoft Visual Studio Debug Console window. The title bar reads "Microsoft Visual Studio Debug Console". The console output is as follows:

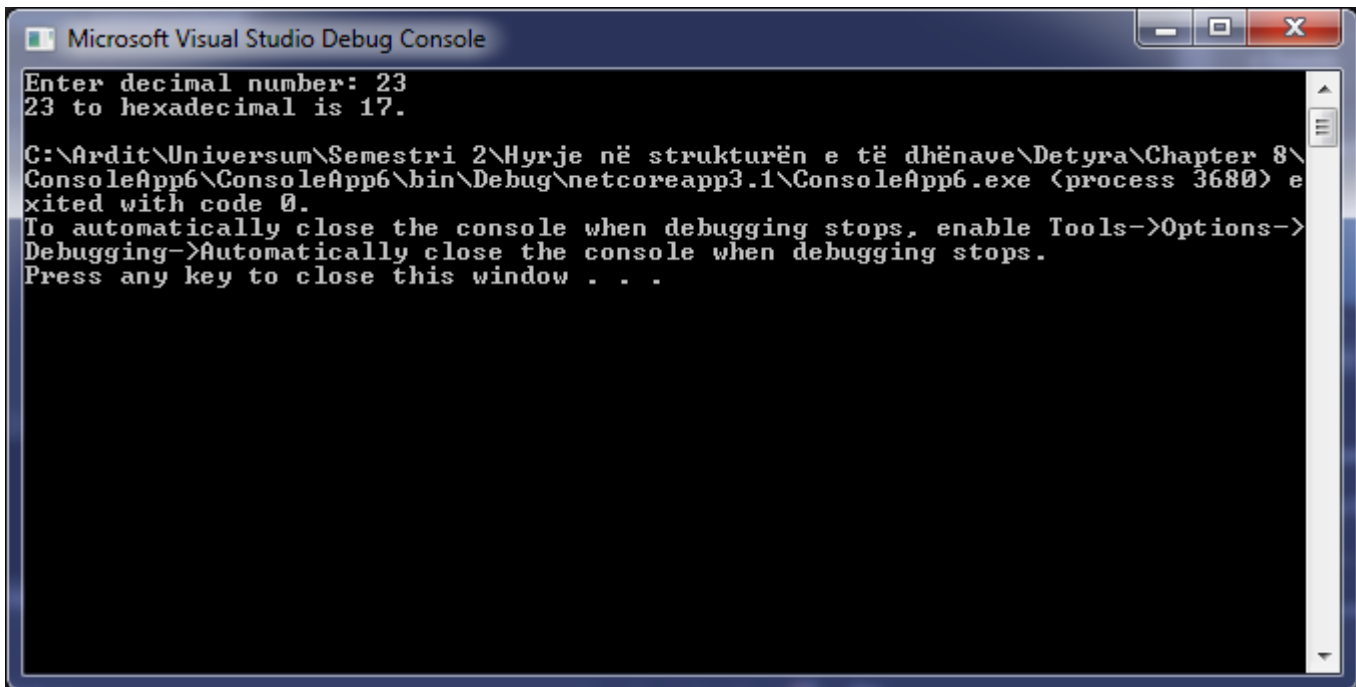
```
Enter binary number: 0011
0011 to decimal is 3.

C:\Ardit\Universum\Semestri 2\Hyrje në strukturën e të dhënave\Detyra\Chapter 8\
ConsoleApp5\ConsoleApp5\bin\Debug\netcoreapp3.1\ConsoleApp5.exe (process 8060) e
xited 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. Write a program that converts a **decimal number to hexadecimal one**.

```
using System;

namespace ConsoleApp6
{
    class Program
    {
        static void Main(string[] args)
        {
            Console.Write("Enter decimal number: ");
            int deci = Int32.Parse(Console.ReadLine());
            Console.WriteLine("{0} to hexadecimal is {1}.",
                deci, deci.ToString("X"));
        }
    }
}
```



The screenshot shows the Microsoft Visual Studio Debug Console window. The title bar reads "Microsoft Visual Studio Debug Console". The console output is as follows:

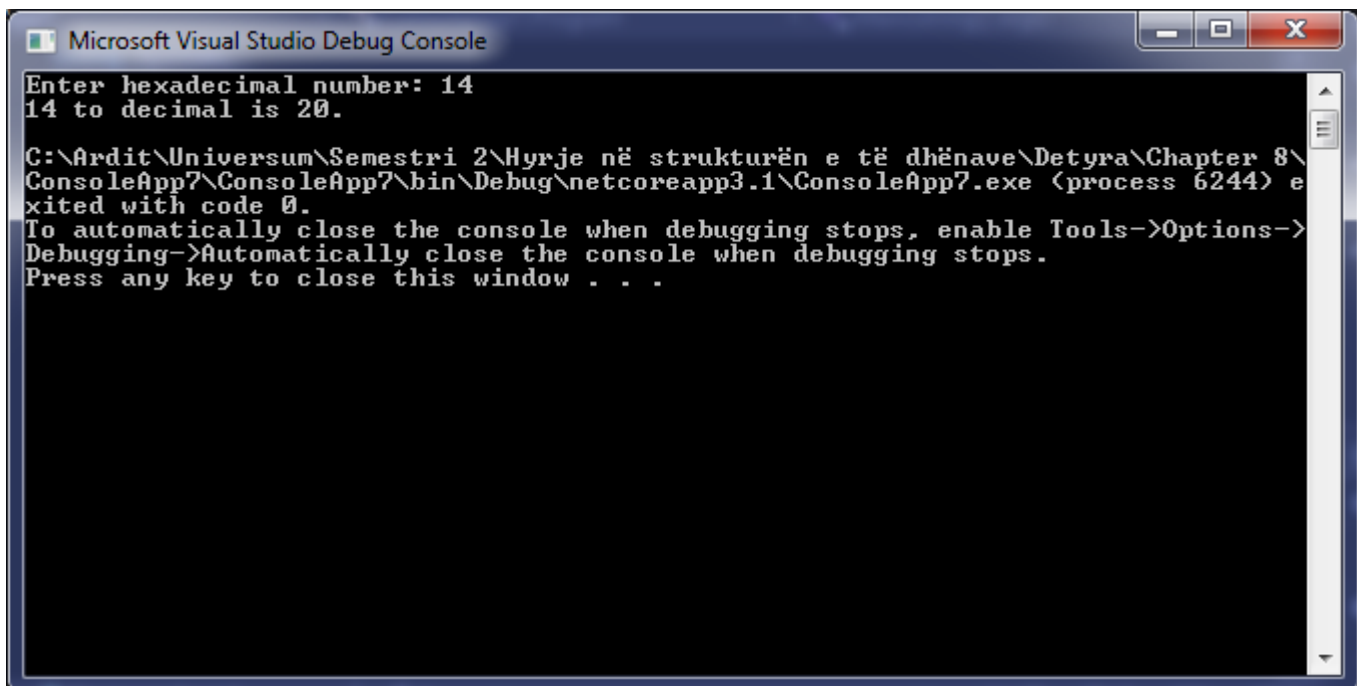
```
Enter decimal number: 23
23 to hexadecimal is 17.

C:\Ardit\Universum\Semestri 2\Hyrje në strukturën e të dhënave\Detyra\Chapter 8\
ConsoleApp6\ConsoleApp6\bin\Debug\netcoreapp3.1\ConsoleApp6.exe (process 3680) e
xited 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. Write a program that converts a **hexadecimal number to decimal one**.

```
using System;

namespace ConsoleApp7
{
    class Program
    {
        static void Main(string[] args)
        {
            Console.Write("Enter hexadecimal number: ");
            string hexa = Console.ReadLine();
            Console.WriteLine("{0} to decimal is {1}.",
                hexa, Convert.ToInt32(hexa, 16));
        }
    }
}
```



The screenshot shows the Microsoft Visual Studio Debug Console window. The title bar reads "Microsoft Visual Studio Debug Console". The console output is as follows:

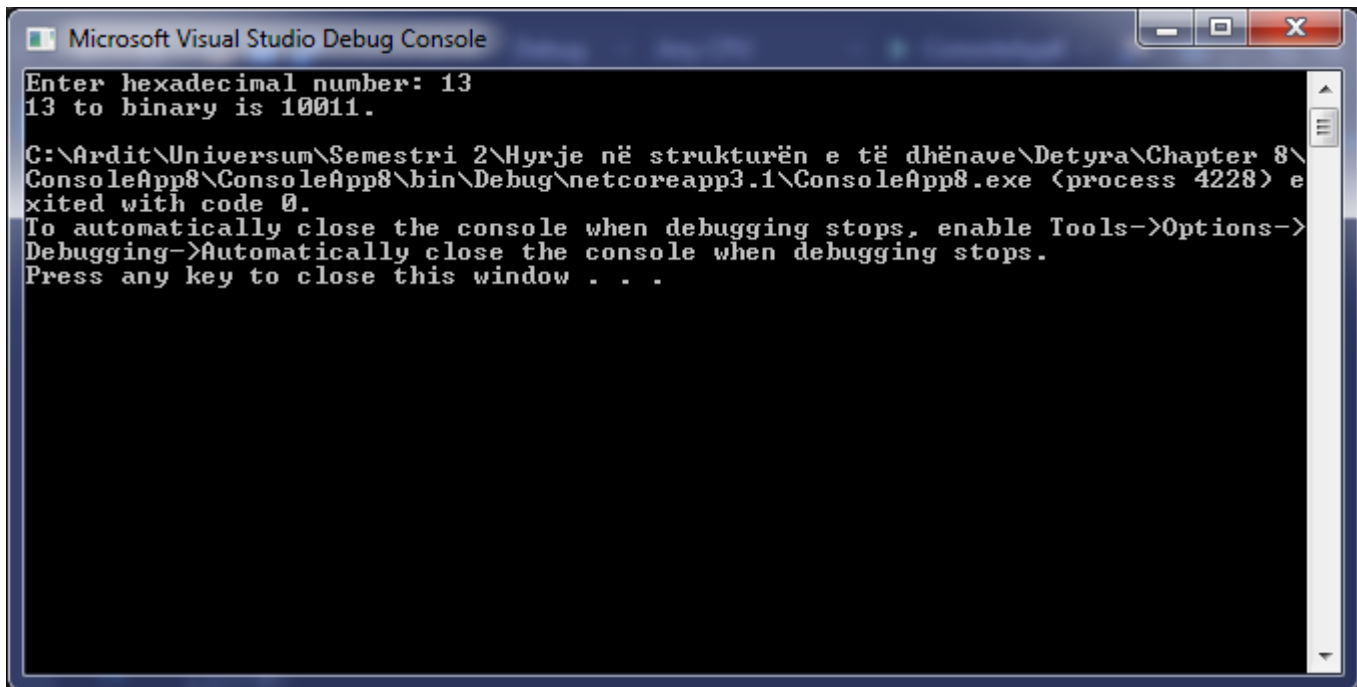
```
Enter hexadecimal number: 14
14 to decimal is 20.

C:\Ardit\Universum\Semestri 2\Hyrje në strukturën e të dhënave\Detyra\Chapter 8\
ConsoleApp7\ConsoleApp7\bin\Debug\netcoreapp3.1\ConsoleApp7.exe (process 6244) e
xited 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. Write a program that converts a **hexadecimal number** to **binary one**.

```
using System;

namespace ConsoleApp8
{
    class Program
    {
        static void Main(string[] args)
        {
            Console.Write("Enter hexadecimal number: ");
            string hexa = Console.ReadLine();
            Console.WriteLine("{0} to binary is {1}.",
                hexa, Convert.ToString(Convert.ToInt32(hexa, 16), 2));
        }
    }
}
```



The screenshot shows the Microsoft Visual Studio Debug Console window. The title bar reads "Microsoft Visual Studio Debug Console". The console output is as follows:

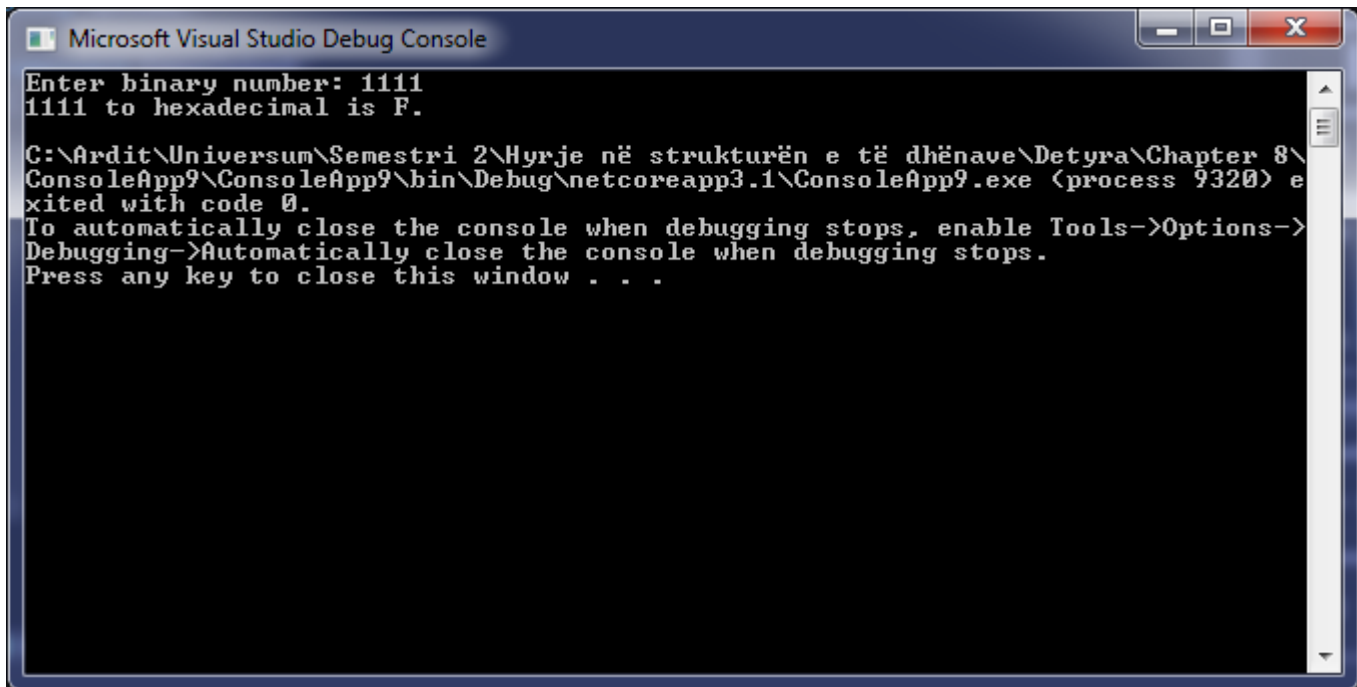
```
Enter hexadecimal number: 13
13 to binary is 10011.

C:\Ardit\Universum\Semestri 2\Hyrje në strukturën e të dhënave\Detyra\Chapter 8\
ConsoleApp8\ConsoleApp8\bin\Debug\netcoreapp3.1\ConsoleApp8.exe (process 4228) e
xited 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. Write a program that converts a **binary number to hexadecimal one**.

```
using System;

namespace ConsoleApp9
{
    class Program
    {
        static void Main(string[] args)
        {
            Console.Write("Enter binary number: ");
            string binary = Console.ReadLine();
            Console.WriteLine("{0} to hexadecimal is {1}.",
                binary, Convert.ToInt32(binary, 2).ToString("X"));
        }
    }
}
```



The screenshot shows the Microsoft Visual Studio Debug Console window. The title bar reads "Microsoft Visual Studio Debug Console". The console output is as follows:

```
Enter binary number: 1111
1111 to hexadecimal is F.

C:\Ardit\Universum\Semestri 2\Hyrje në strukturën e të dhënave\Detyra\Chapter 8\
ConsoleApp9\ConsoleApp9\bin\Debug\netcoreapp3.1\ConsoleApp9.exe (process 9320) e
xited 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. Write a program that converts a **binary number to decimal** using the Horner scheme.

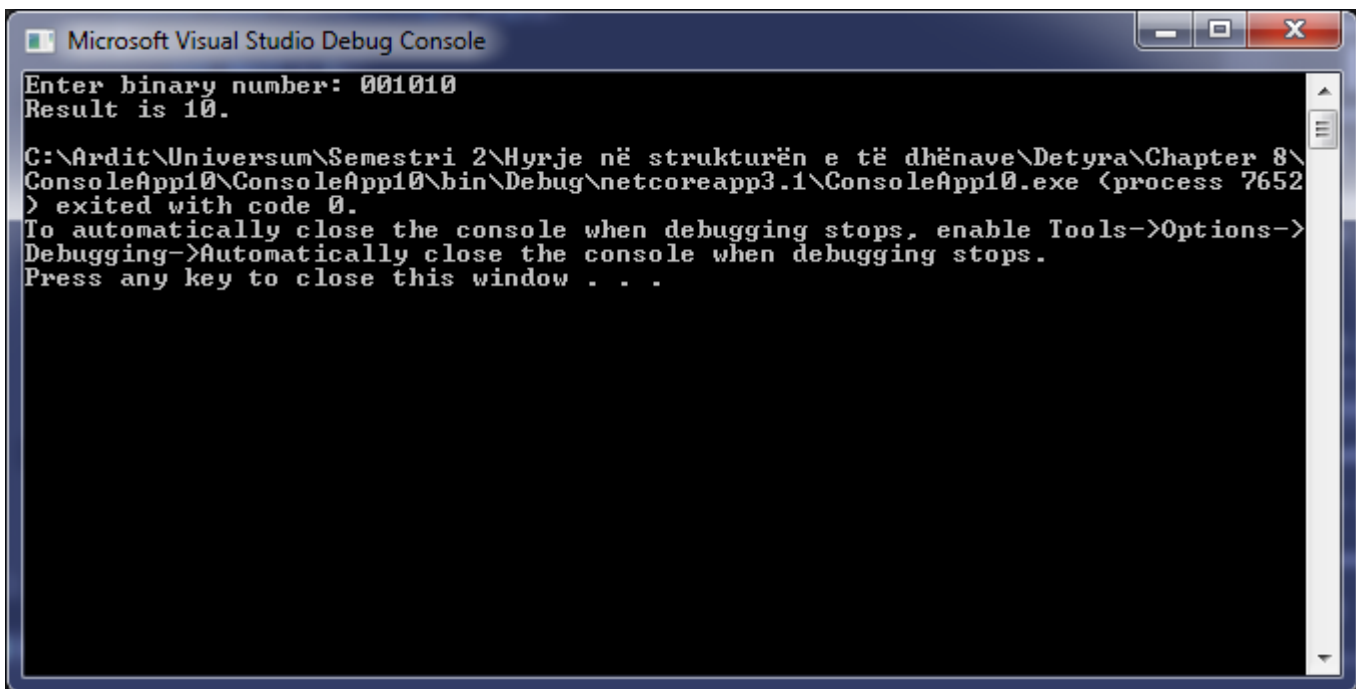
```
using System;

namespace ConsoleApp10
{
    class Program
    {
        static void Main(string[] args)
        {
            int deci = 0;

            Console.Write("Enter binary number: ");
            string binary = Console.ReadLine();
            int length = binary.Length;
            int power = length - 1;

            for (int i = 0; i < length; i++)
            {
                deci += (int)(int.Parse(binary[i].ToString()) * Math.Pow(2, power));
                power--;
            }

            Console.WriteLine("Result is {0}.", deci);
        }
    }
}
```



The screenshot shows the Microsoft Visual Studio Debug Console window. The title bar reads "Microsoft Visual Studio Debug Console". The console output is as follows:

```
Enter binary number: 001010
Result is 10.

C:\Ardit\Universum\Semestri 2\Hyrje në strukturën e të dhënave\Detyra\Chapter 8\
ConsoleApp10\ConsoleApp10\bin\Debug\netcoreapp3.1\ConsoleApp10.exe <process 7652
> 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. Write a program that converts **Roman digits to Arabic** ones.

```
using System;
```

```
namespace ConsoleApp11
```

```
{
```

```
    class Program
```

```
    {
```

```
        static void Main(string[] args)
```

```
        {
```

```
            static string ToRoman(int number)
```

```
            {
```

```
                if ((number < 0) || (number > 3999)) throw new ArgumentOutOfRangeException("insert  
value between 1 and 3999");
```

```
                if (number < 1) return string.Empty;
```

```
                if (number >= 1000) return "M" + ToRoman(number - 1000);
```

```
                if (number >= 900) return "CM" + ToRoman(number - 900);
```

```
                if (number >= 500) return "D" + ToRoman(number - 500);
```

```
                if (number >= 400) return "CD" + ToRoman(number - 400);
```

```
                if (number >= 100) return "C" + ToRoman(number - 100);
```

```
                if (number >= 90) return "XC" + ToRoman(number - 90);
```

```
                if (number >= 50) return "L" + ToRoman(number - 50);
```

```
                if (number >= 40) return "XL" + ToRoman(number - 40);
```

```
                if (number >= 10) return "X" + ToRoman(number - 10);
```

```
                if (number >= 9) return "IX" + ToRoman(number - 9);
```

```
                if (number >= 5) return "V" + ToRoman(number - 5);
```

```
                if (number >= 4) return "IV" + ToRoman(number - 4);
```

```
                if (number >= 1) return "I" + ToRoman(number - 1);
```

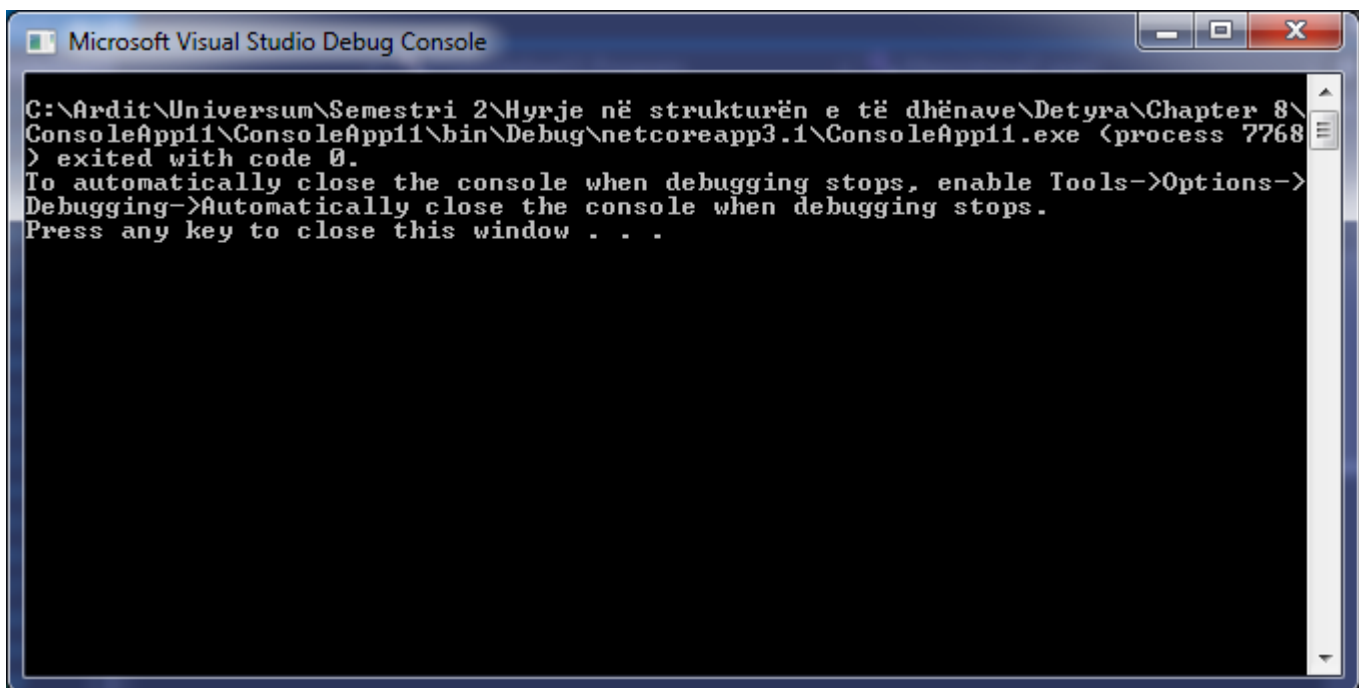
```
                throw new ArgumentOutOfRangeException("something bad happened");
```

```
            }
```

```
        }
```

```
    }
```

```
}
```



12. Write a program that converts **Arabic digits to Roman ones**.

```
using System;

namespace ConsoleApp12
{
    class Program
    {
        static void Main(string[] args)
        {
            String result = "";
            Console.Write("Enter Arabic number: ");
            int i = Convert.ToInt32(Console.ReadLine());
            int thousands = i / 1000, hundreds = (i / 100) % 10, tens = (i / 10) % 10, ones = i % 10;

            switch (thousands)
            {
                case 1: result += "M"; break;
                case 2: result += "MM"; break;
                case 3: result += "MMM"; break;
            }

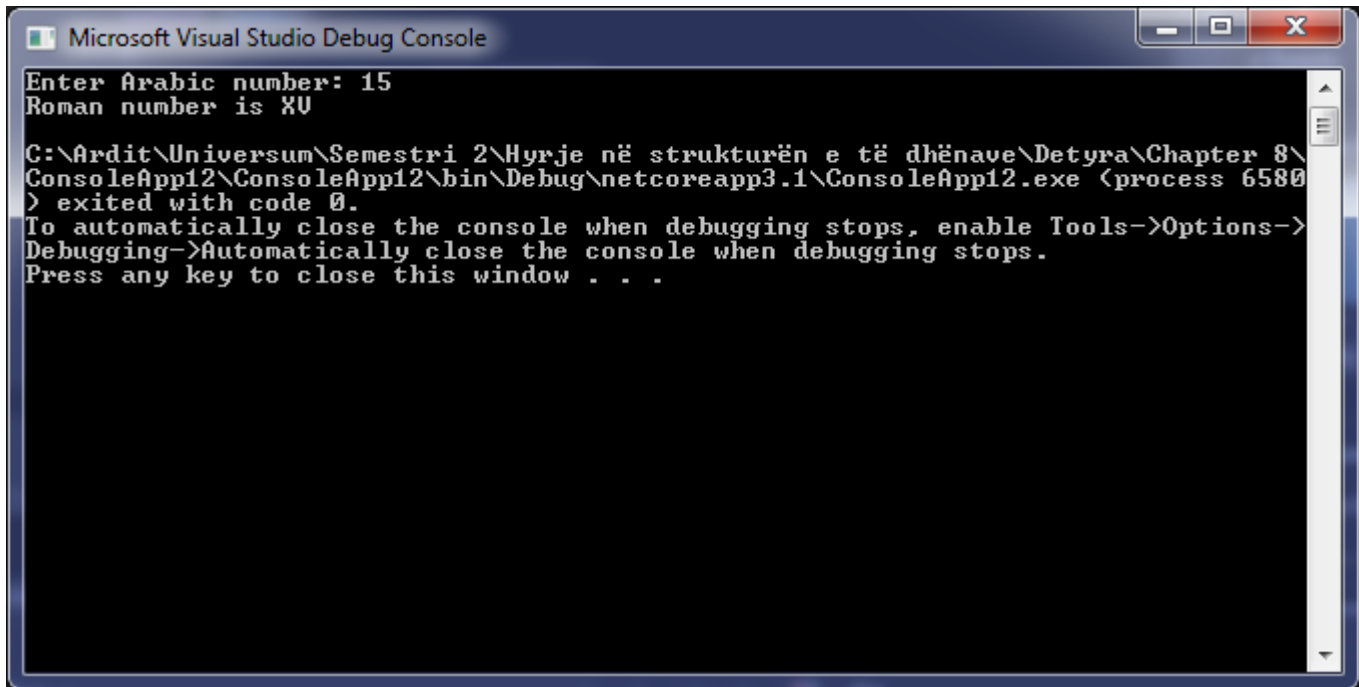
            switch (hundreds)
            {
                case 1: result += "C"; break;
                case 2: result += "CC"; break;
                case 3: result += "CCC"; break;
                case 4: result += "CD"; break;
                case 5: result += "D"; break;
                case 6: result += "DC"; break;
                case 7: result += "DCC"; break;
                case 8: result += "DCCC"; break;
                case 9: result += "CM"; break;
            }

            switch (tens)
            {
                case 1: result += "X"; break;
                case 2: result += "XX"; break;
                case 3: result += "XXX"; break;
                case 4: result += "XL"; break;
                case 5: result += "L"; break;
                case 6: result += "LX"; break;
                case 7: result += "LXX"; break;
                case 8: result += "LXXX"; break;
                case 9: result += "XC"; break;
            }

            switch (ones)
            {
                case 1: result += "I"; break;
                case 2: result += "II"; break;
                case 3: result += "III"; break;
                case 4: result += "IV"; break;
                case 5: result += "V"; break;
                case 6: result += "VI"; break;
                case 7: result += "VII"; break;
                case 8: result += "VIII"; break;
                case 9: result += "IX"; break;
            }

            Console.WriteLine("Roman number is " + result);
        }
    }
}
```

```
}  
}
```



The image shows a screenshot of the Microsoft Visual Studio Debug Console window. The window has a title bar with the text "Microsoft Visual Studio Debug Console" and standard Windows window controls (minimize, maximize, close). The console area has a black background with white text. The text displayed is as follows:

```
Enter Arabic number: 15  
Roman number is XV  
  
C:\Ardit\Universum\Semestri 2\Hyrje në strukturën e të dhënave\Detyra\Chapter 8\  
ConsoleApp12\ConsoleApp12\bin\Debug\netcoreapp3.1\ConsoleApp12.exe (process 6580  
) 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 . . .
```

13. Write a program that by given N, S, D converts the number N from an S-based numeral system to a D based numeral system.

```
using System;

namespace ConsoleApp13
{
    class Program
    {
        static void Main(string[] args)
        {
            int s, d;

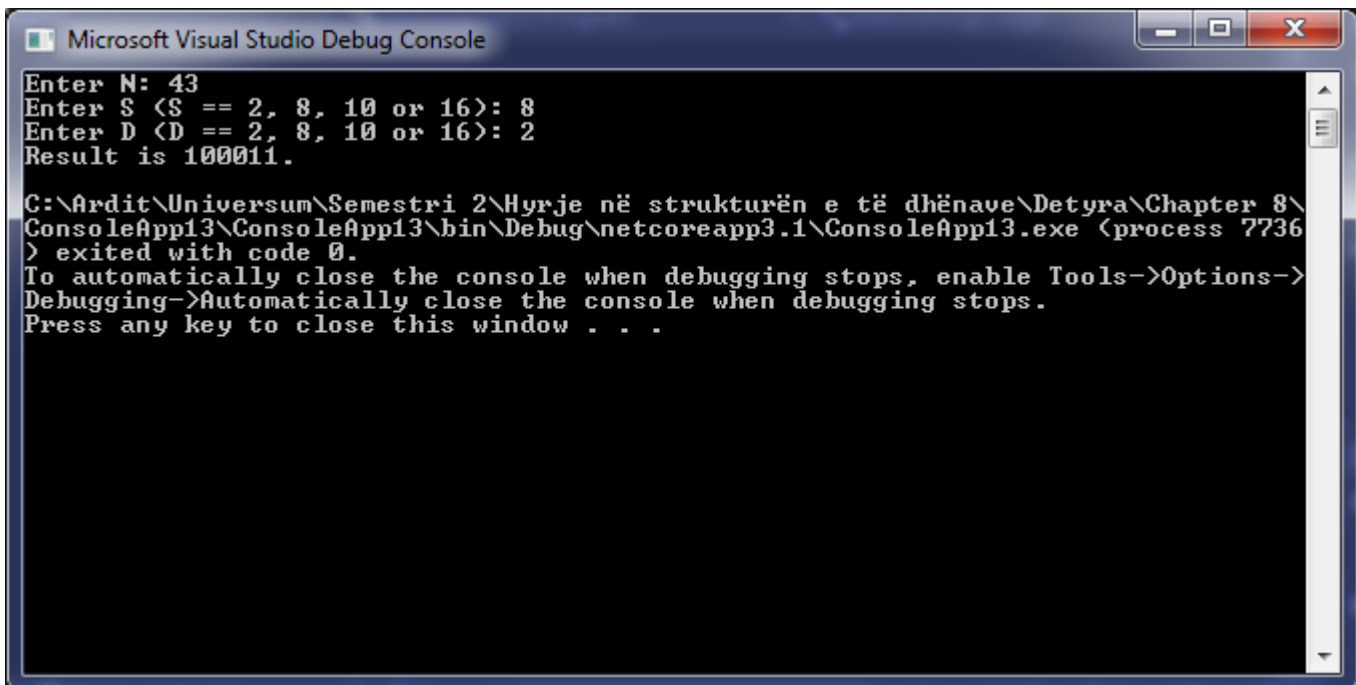
            Console.Write("Enter N: ");
            string n = Console.ReadLine();

            do
            {
                Console.Write("Enter S (S == 2, 8, 10 or 16): ");
                s = Int32.Parse(Console.ReadLine());
            } while (s != 2 && s != 8 && s != 10 && s != 16);

            do
            {
                Console.Write("Enter D (D == 2, 8, 10 or 16): ");
                d = Int32.Parse(Console.ReadLine());
            } while (d != 2 && d != 8 && d != 10 && d != 16);

            n = Convert.ToString(Convert.ToInt32(n, s), d);

            Console.WriteLine("Result is {0}.", n);
        }
    }
}
```



```
Microsoft Visual Studio Debug Console

Enter N: 43
Enter S <S == 2, 8, 10 or 16>: 8
Enter D <D == 2, 8, 10 or 16>: 2
Result is 100011.

C:\Ardit\Univsum\Semestri 2\Hyrje në strukturën e të dhënave\Detyra\Chapter 8\
ConsoleApp13\ConsoleApp13\bin\Debug\netcoreapp3.1\ConsoleApp13.exe <process 7736
> 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 . . .
```