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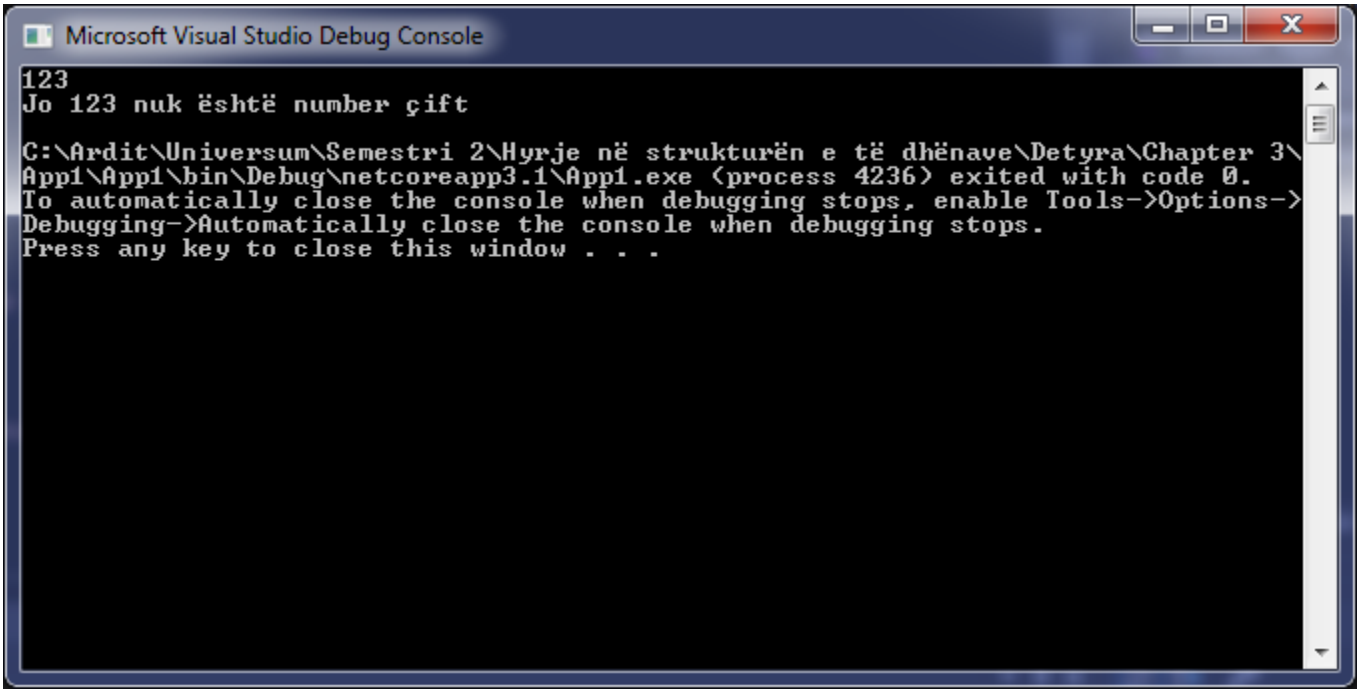
Drejtimi: Shkenca Kompjuterike
Kampusi: Prishtinë/ Lipjan
Viti: I parë
Statusi: I rregullt

Chapter 3

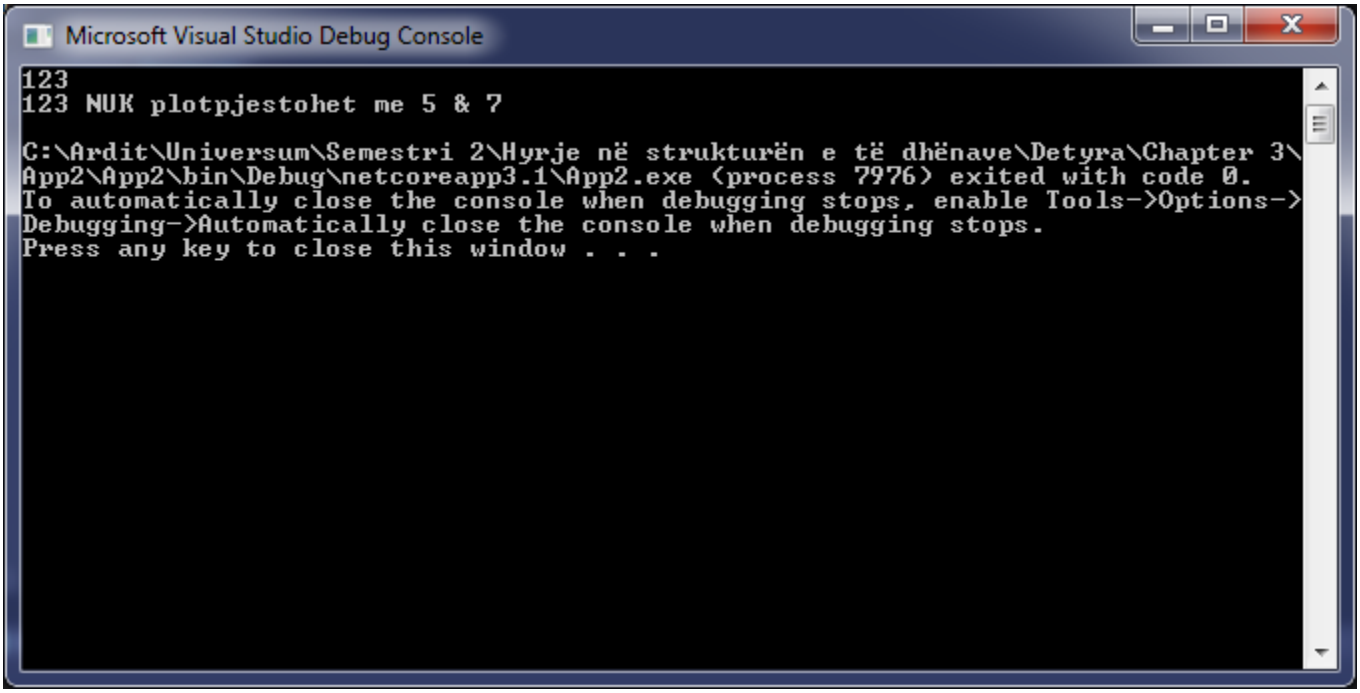
1. Write an expression that checks whether an integer is odd or even.

```
using System;

namespace App1
{
    class Program
    {
        static void Main(string[] args)
        {
            int numri = int.Parse(Console.ReadLine());
            if (numri % 2 == 0)
            {
                Console.WriteLine("Po {0} është number çift", numri);
            }
            else
            {
                Console.WriteLine("Jo {0} nuk është number çift", numri);
            }
        }
    }
}
```



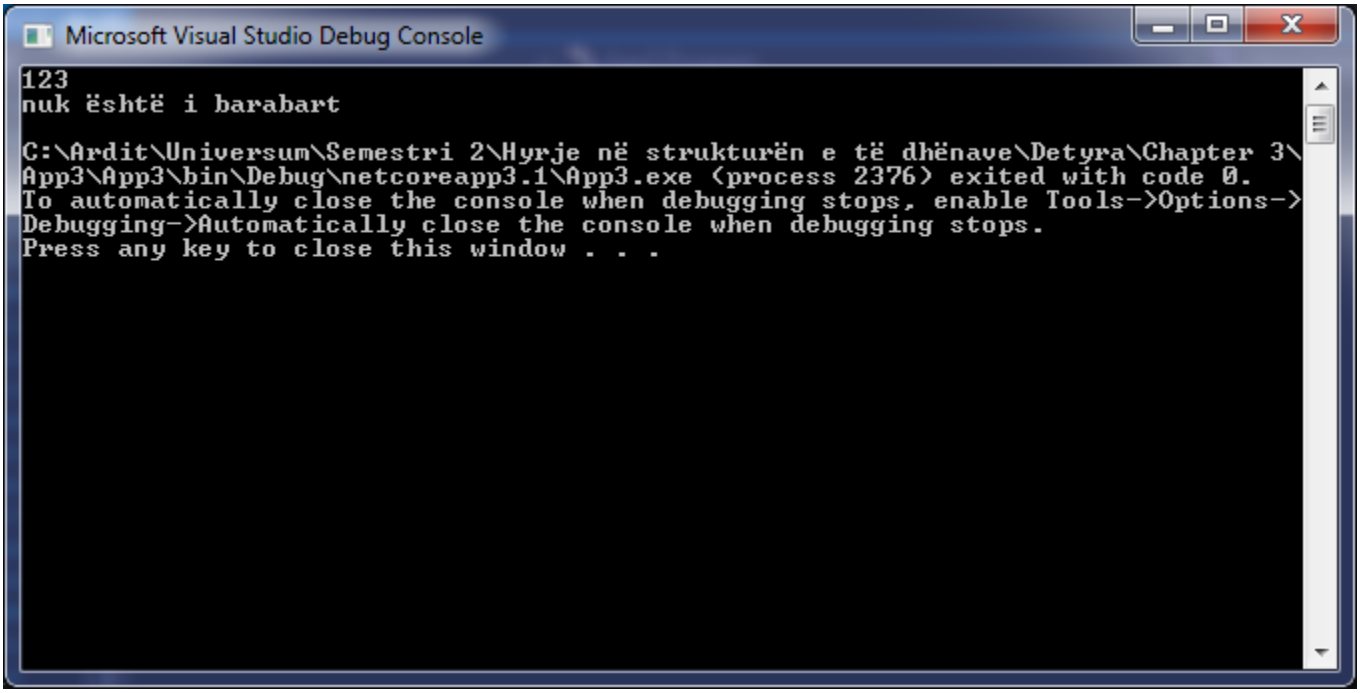
2. Write a Boolean expression that checks whether a given integer is divisible by both 5 and 7, without a remainder.

```
using System;

namespace App2
{
    class Program
    {
        static void Main(string[] args)
        {
            int nmb = int.Parse(Console.ReadLine());
            if (nmb % 5 == 0 && nmb % 7 == 0)
            {
                Console.WriteLine("{0} plotpjestohet me 5 & 7", nmb);
            }
            else
            {
                Console.WriteLine("{0} NUK plotpjestohet me 5 & 7", nmb);
            }
        }
    }
}
```



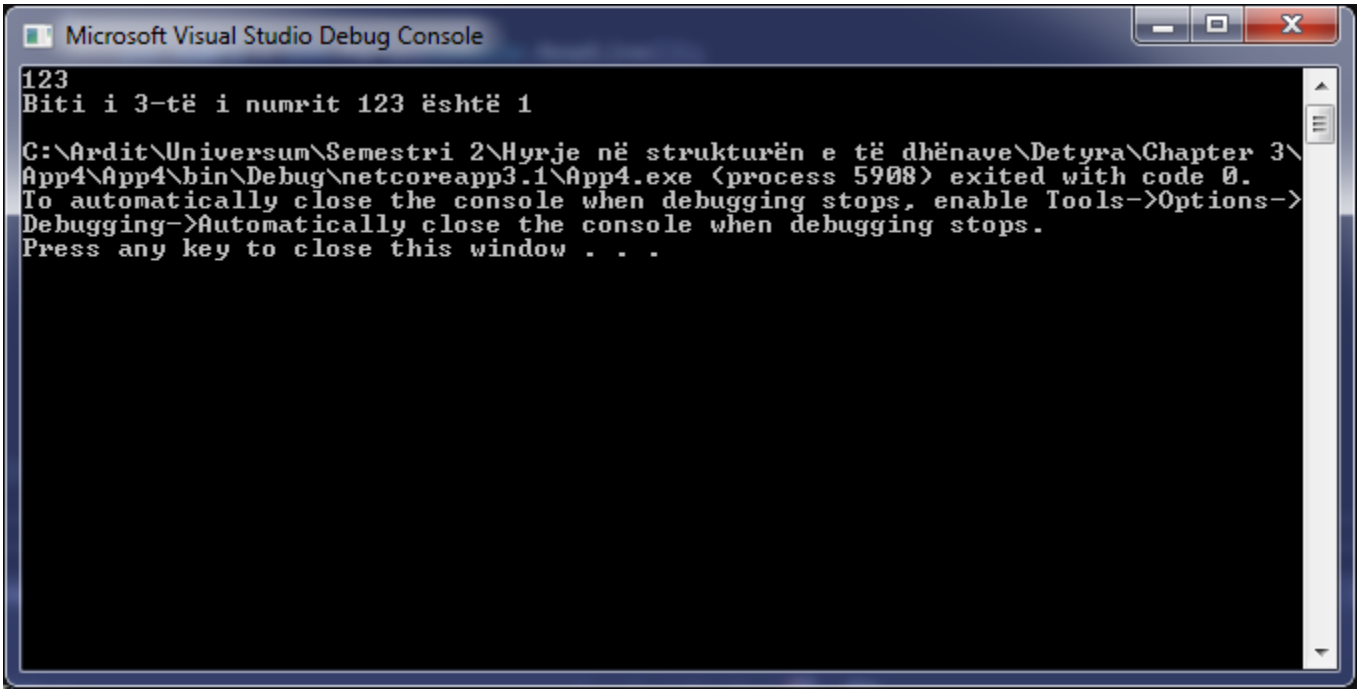
3. Write an expression that looks for a given integer if its third digit (right to left) is 7.

```
using System;

namespace App3
{
    class Program
    {
        static void Main(string[] args)
        {
            int Numri = int.Parse(Console.ReadLine());
            bool even = (Numri / 100) % 10 == 7 ? true : false ;
            if (even == true)
            {
                Console.WriteLine("është i barabartë");
            }
            else
            {
                Console.WriteLine("nuk është i barabart");

            }
        }
    }
}
```



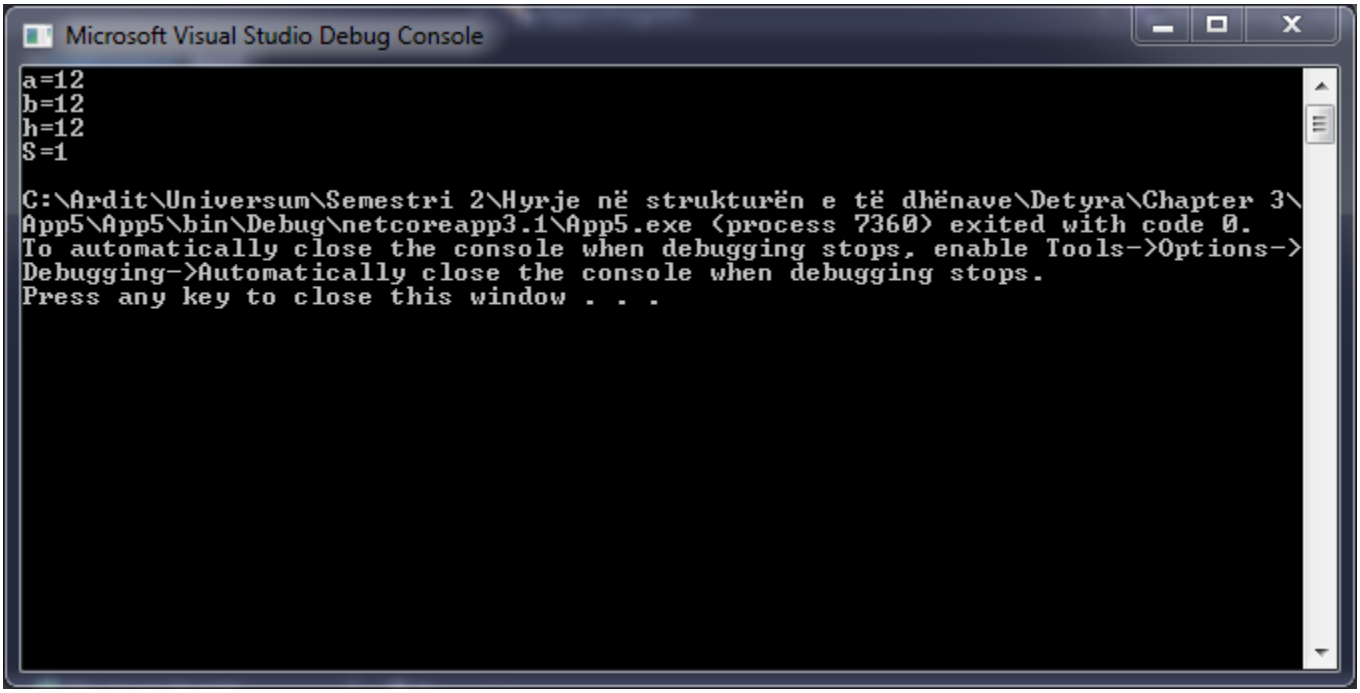
4. Write an expression that checks whether the third bit in a given integer is 1 or 0.

```
using System;

namespace App4
{
    class Program
    {
        static void Main(string[] args)
        {
            int numri = int.Parse(Console.ReadLine());
            bool biti3 = (numri & 8) != 0;
            if (biti3 == true)
            {
                Console.WriteLine("Biti i 3-të i numrit {0} është 1", numri);
            }
            else
            {
                Console.WriteLine("Biti i 3-të i numrit {0} NUK është 1", numri);
            }


        }
    }
}
```



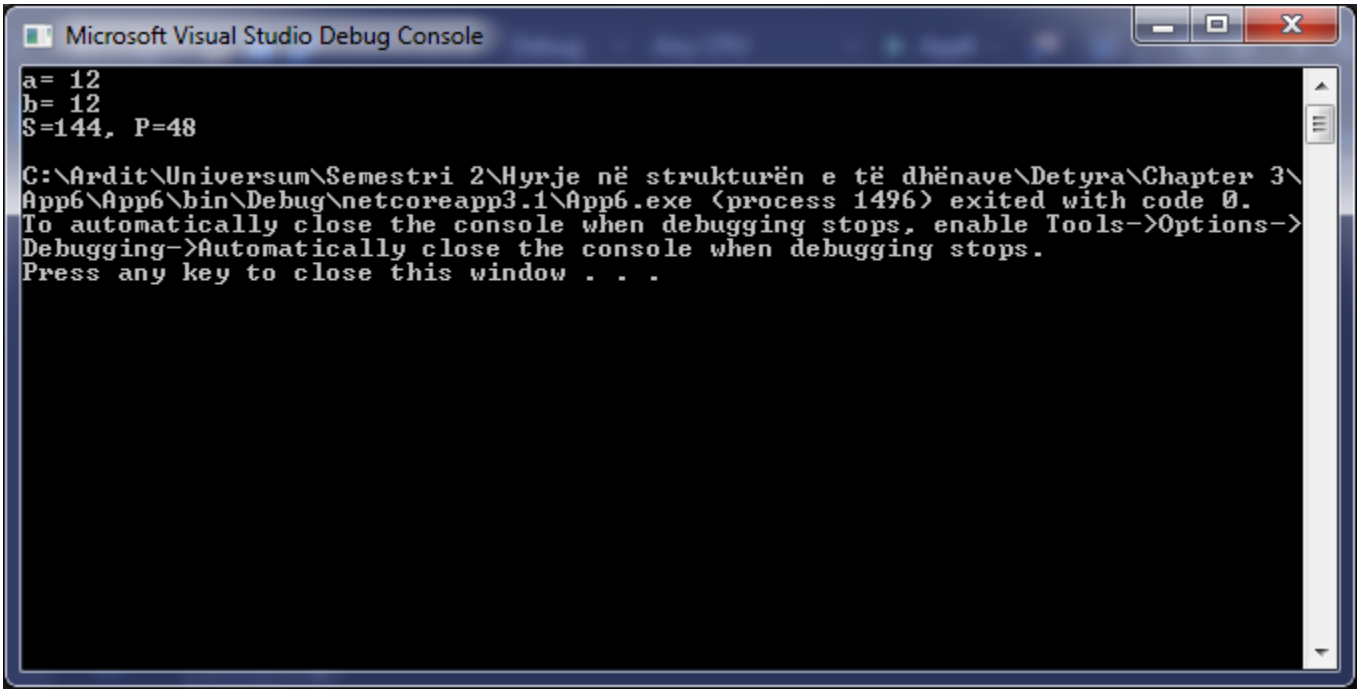
5. Write an expression that calculates the area of a trapezoid by given sides a, b and height h.

```
using System;

namespace App5
{
    class Program
    {
        static void Main(string[] args)
        {
            Console.Write("a=");
            float a = int.Parse(Console.ReadLine());
            Console.Write("b=");
            float b = int.Parse(Console.ReadLine());
            Console.Write("h=");
            float h = int.Parse(Console.ReadLine());

            Console.WriteLine("S={0}", (a + b) / (2 * h));
        }
    }
}
```



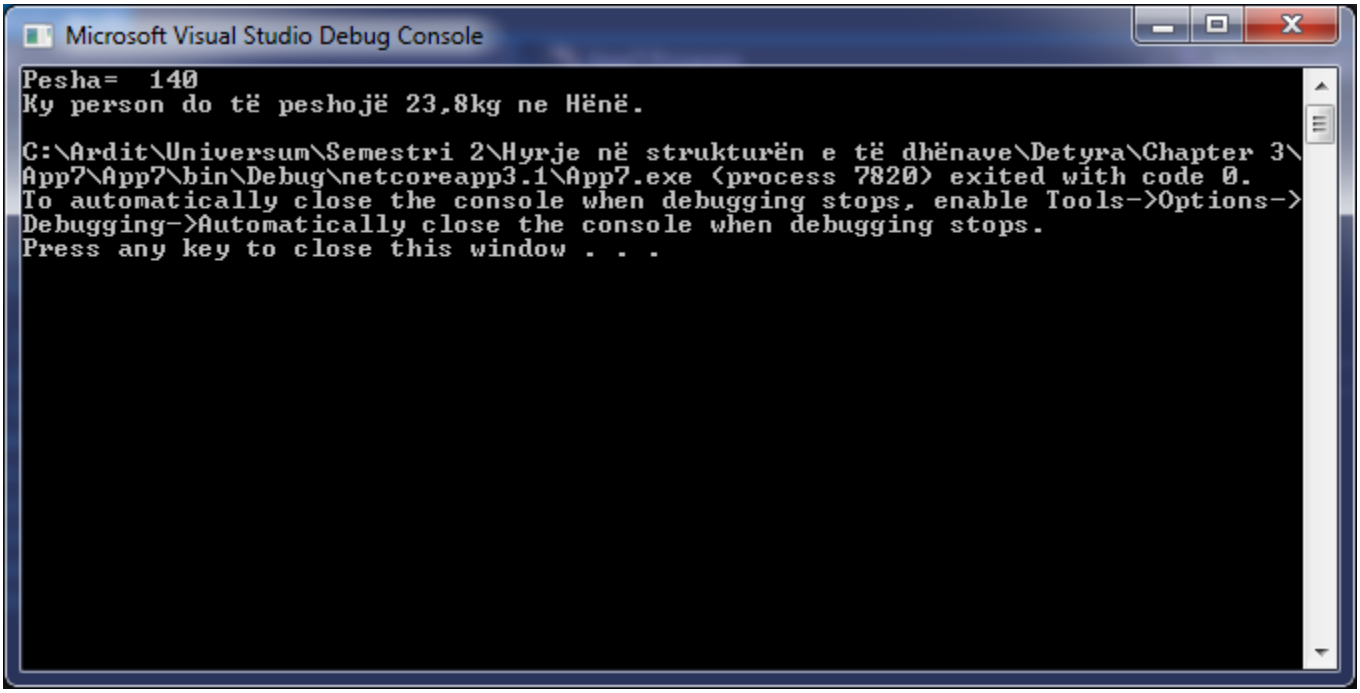
6. Write a program that prints on the console the perimeter and the area of a rectangle by given side and height entered by the user.

```
using System;

namespace App6
{
    class Program
    {
        static void Main(string[] args)
        {
            Console.Write("a= ");
            int a = Convert.ToInt32(Console.ReadLine());
            Console.Write("b= ");
            int b = Convert.ToInt32(Console.ReadLine());
            Console.WriteLine("S={0}, P={1}", a * b, (a + b) * 2);
        }
    }
}
```



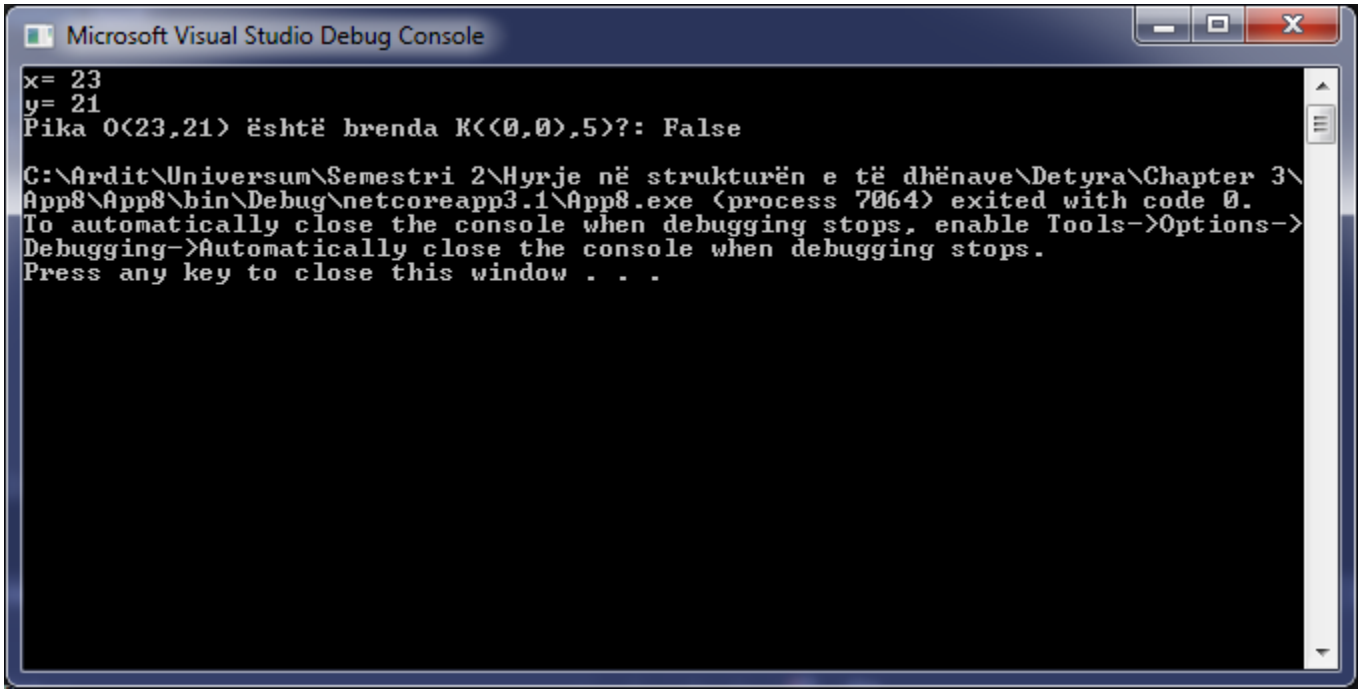
7. The gravitational field of the Moon is approximately 17% of that on the Earth. Write a program that calculates the weight of a man on the moon by a given weight on the Earth.

```
using System;

namespace App7
{
    class Program
    {
        static void Main(string[] args)
        {
            Console.Write("Pesha=  ");
            int weight = Convert.ToInt32(Console.ReadLine());
            Console.WriteLine("Ky person do të peshojë {0}kg ne Hënë.", weight * 0.17);
        }
    }
}
```



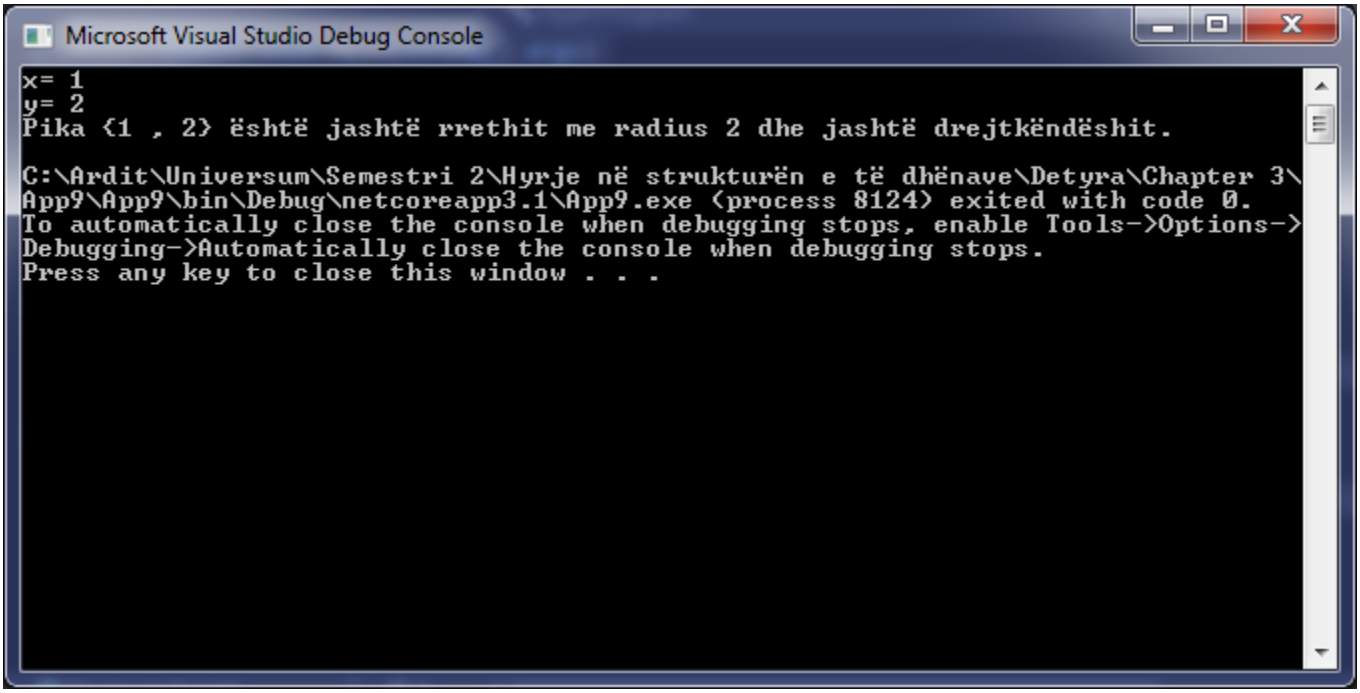
8. Write an expression that checks for a given point {x, y} if it is within the circle K({0, 0}, R=5). Explanation: the point {0, 0} is the center of the circle and 5 is the radius.

```
using System;

namespace App8
{
    class Program
    {
        static void Main(string[] args)
        {
            Console.Write("x= ");
            int x = Convert.ToInt32(Console.ReadLine());
            Console.Write("y= ");
            int y = Convert.ToInt32(Console.ReadLine());
            bool isInside = (x  *+y * y <= 5) ? true : false;
            Console.WriteLine("Pika O({0},{1}) është brenda K((0,0),5)?: {2}", x, y, isInside);
        }
    }
}
```



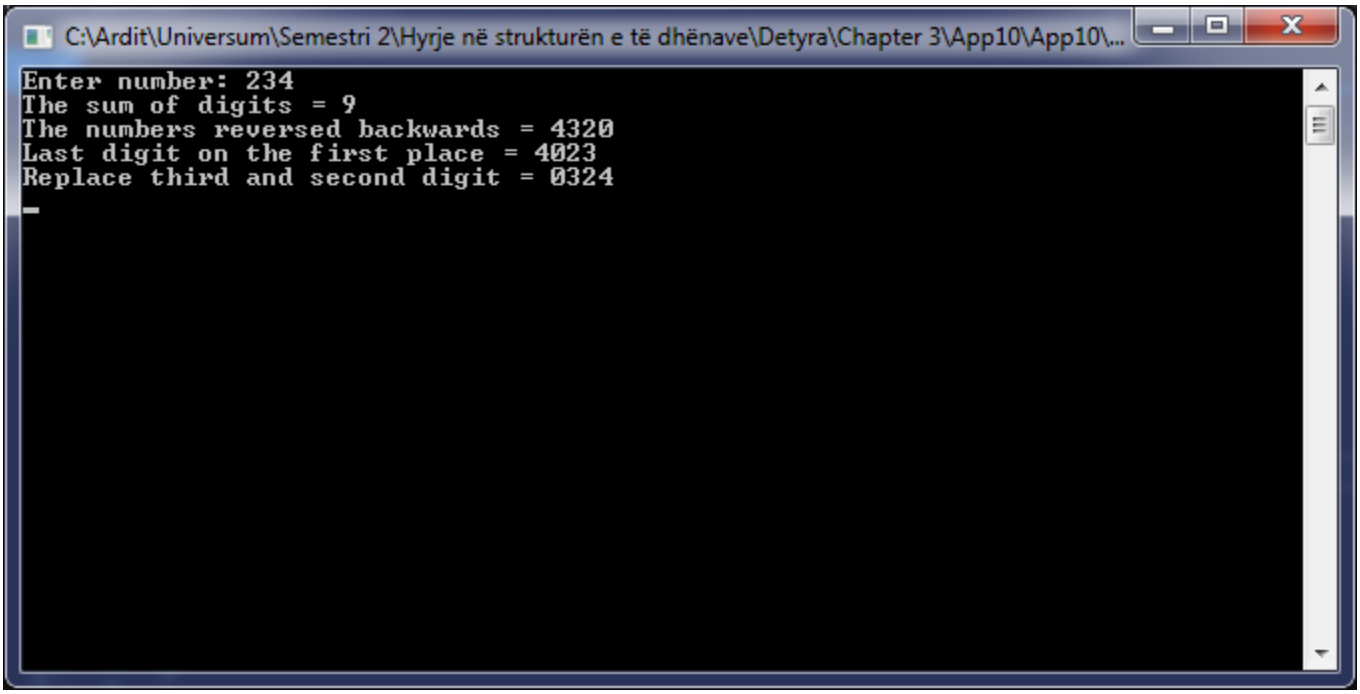
9. Write an expression that checks for given point {x, y} if it is within the circle K({0, 0}, R=5) and out of the rectangle [{-1, 1}, {5, 5}]. Clarification: for the rectangle the lower left and the upper right corners are given.

```
using System;

namespace App9
{
    class Program
    {
        static void Main(string[] args)
        {
                    Console.Write("x= ");
                    int x = int.Parse(Console.ReadLine());
                    Console.Write("y= ");
                    int y = int.Parse(Console.ReadLine());
                    int R = 5;

                    if ((x * x) + (y * y) <= R * R && (x < -1 || y < 1))
                    {
                           Console.WriteLine("Pika {{{0} , {1}}} është brenda rrethit me radius {1} dhe jashtë drejtkëndëshit.", x, y, R);
                    }
                    else
                    {
                           Console.WriteLine("Pika {{{0} , {1}}} është jashtë rrethit me radius {1} dhe jashtë drejtkëndëshit.", x, y, R);
                    }
            }
    }
}
```



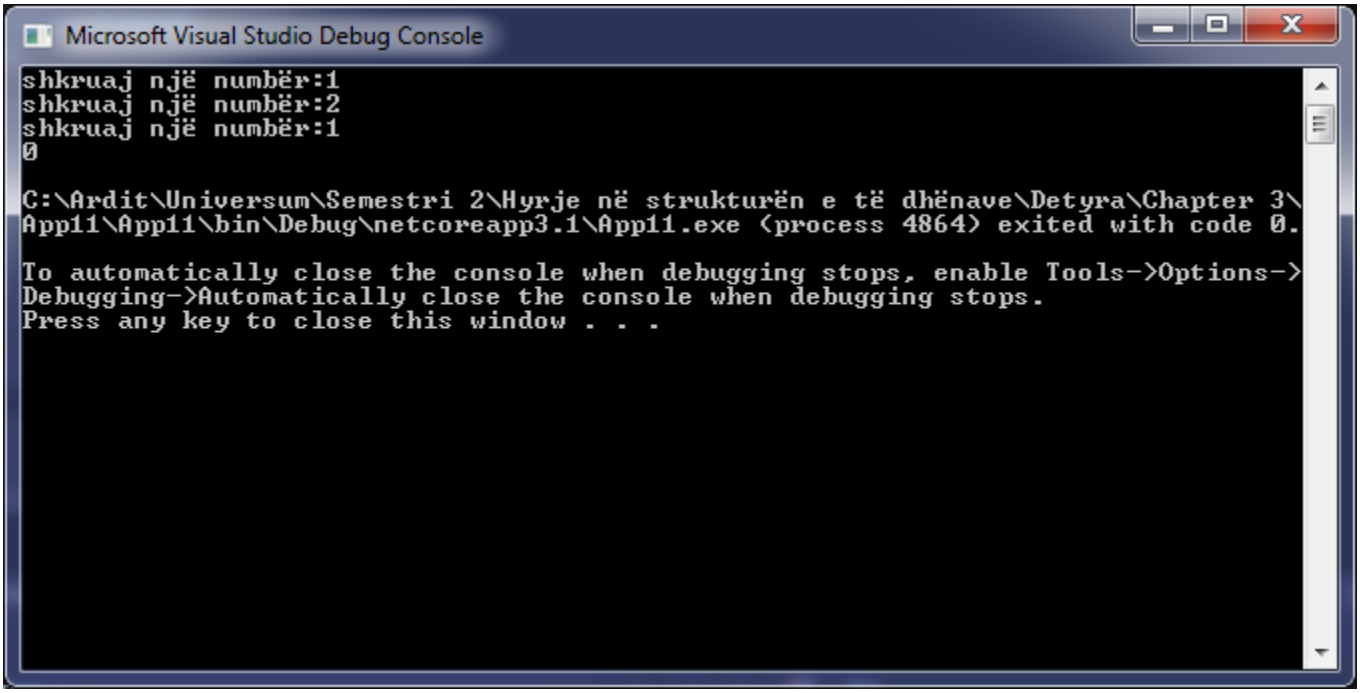
10. Write a program that takes as input a four-digit number in format abcd (e.g. 2011) and performs the following actions: - Calculates the sum of the digits (in our example 2+0+1+1 = 4). - Prints on the console the number in reversed order: dcba (in our example 1102). - Puts the last digit in the first position: dabc (in our example 1201). - Exchanges the second and the third digits: acbd (in our example 2101). Chapter 3. Operators and Expressions 161

```
using System;

namespace App10
{
    class Program
    {
        static void Main(string[] args)
        {
            Console.Write("Enter number: ");
            int number = Convert.ToInt32(Console.ReadLine());
            int a = number / 1000;
            int b = (number / 100) % 10;
            int c = (number / 10) % 10;
            int d = number % 10;

            Console.WriteLine("The sum of digits = {0}", a + b + c + d);
            Console.WriteLine("The numbers reversed backwards = {3}{2}{1}{0}", a, b, c, d);
            Console.WriteLine("Last digit on the first place = {3}{0}{1}{2}", a, b, c, d);
            Console.WriteLine("Replace third and second digit = {0}{2}{1}{3}", a, b, c, d);

            Console.ReadKey();
        }
    }
}
```



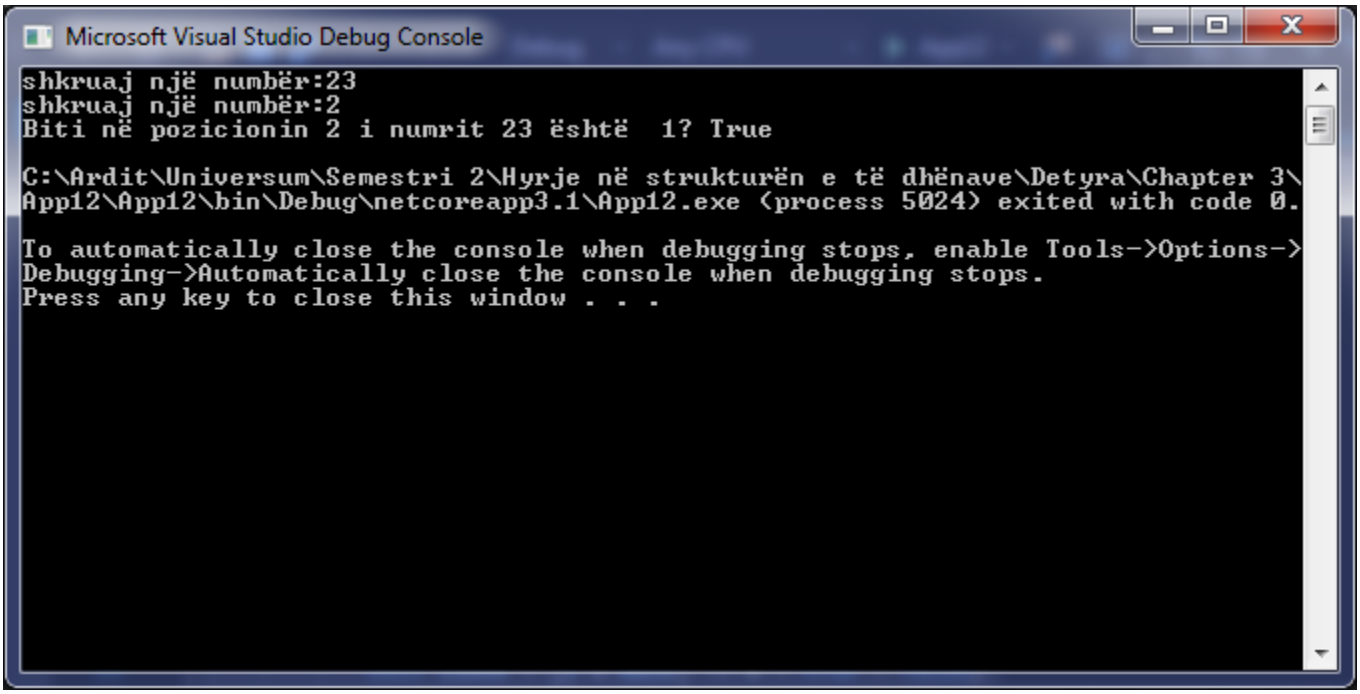
11. We are given a number n and a position p. Write a sequence of operations that prints the value of the bit on the position p in the number (0 or 1). Example: n=35, p=5 -> 1. Another example: n=35, p=6 -> 0.

```
using System;

namespace App11
{
    class Program
    {
        static void Main(string[] args)
        {
            Console.Write("shkruaj një numbër:");
            int n = int.Parse(Console.ReadLine());
            Console.Write("shkruaj një numbër:");
            int p = int.Parse(Console.ReadLine());
            Console.Write("shkruaj një numbër:");
            int i = int.Parse(Console.ReadLine());
            int mask = i << p;

            Console.WriteLine((n & mask) != 0 ? 1 : 0);
        }
    }
}
```



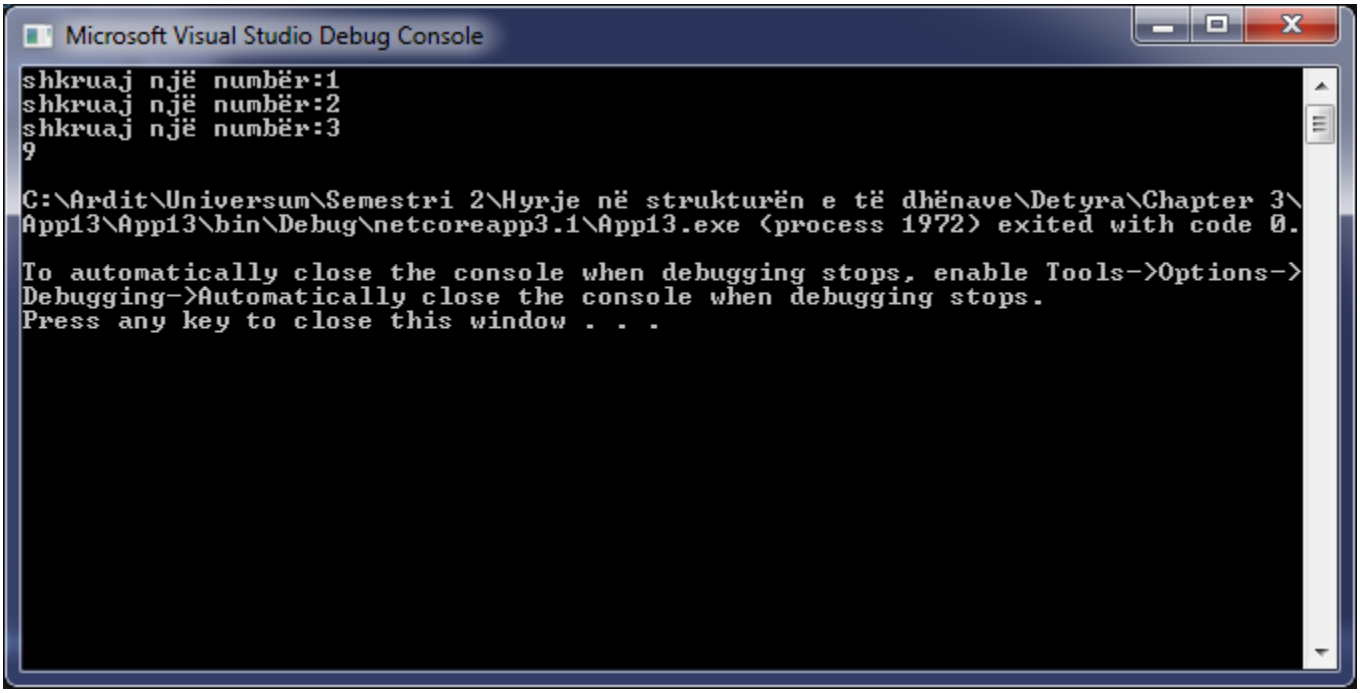
12. Write a Boolean expression that checks if the bit on position p in the integer v has the value 1. Example v=5, p=1 -> false.

```
using System;

namespace App12
{
    class Program
    {
        static void Main(string[] args)
        {
            Console.Write("shkruaj një numbër:");
            int v = int.Parse(Console.ReadLine());
            Console.Write("shkruaj një numbër:");
            int p = int.Parse(Console.ReadLine());
            int mask = 1 << p;
            bool isOne = (v & mask) != 0 ? true : false;
            Console.WriteLine("Biti në pozicionin {0} i numrit {1} është  1? {2}", p, v, isOne);
        }
    }
}
```



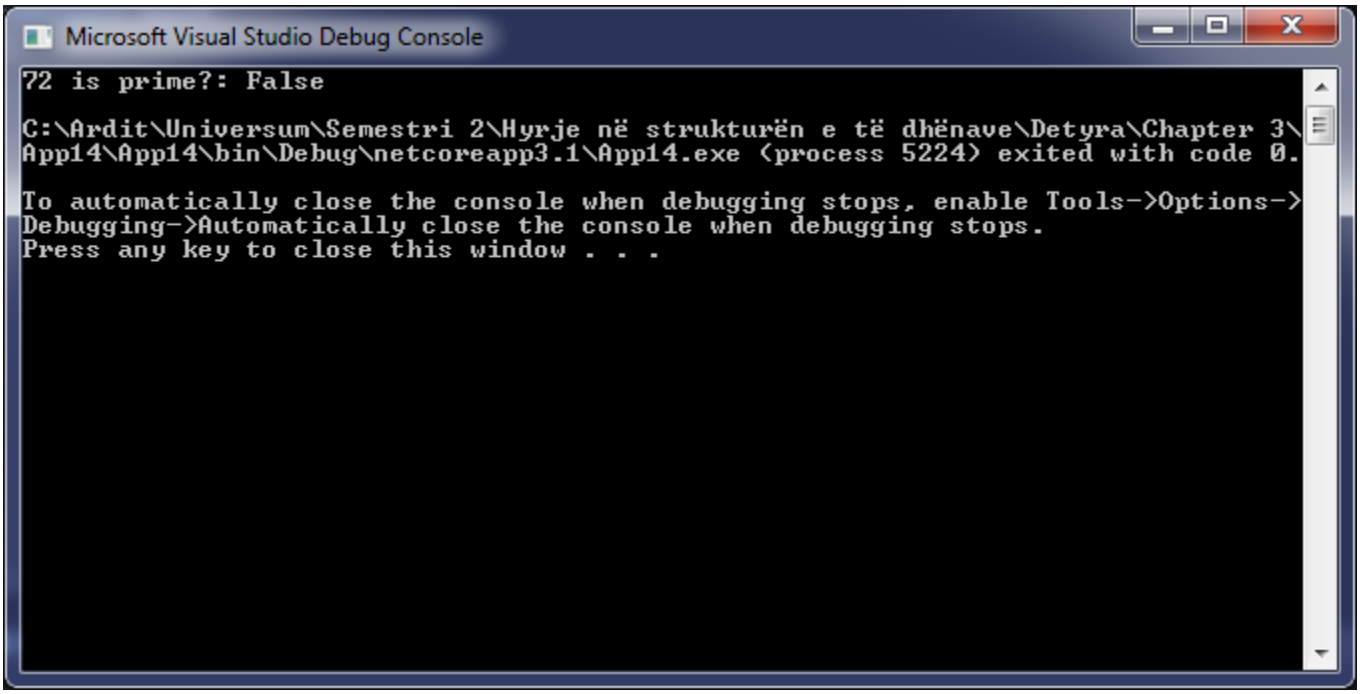
13. We are given the number n, the value v (v = 0 or 1) and the position p. write a sequence of operations that changes the value of n, so the bit on the position p has the value of v. Example: n=35, p=5, v=0 -> n=3. Another example: n=35, p=2, v=1 -> n=39.

```
using System;

namespace App13
{
    class Program
    {
        static void Main(string[] args)
        {
            Console.Write("shkruaj një numër:");
            int n = int.Parse(Console.ReadLine());
            Console.Write("shkruaj një numër:");
            int v = int.Parse(Console.ReadLine());
            Console.Write("shkruaj një numër:");
            int p = int.Parse(Console.ReadLine());
            n = (v == 0) ? n = n & (~(1 << p)) : n = n | (1 << p);
            Console.WriteLine(n);
        }
    }
}
```



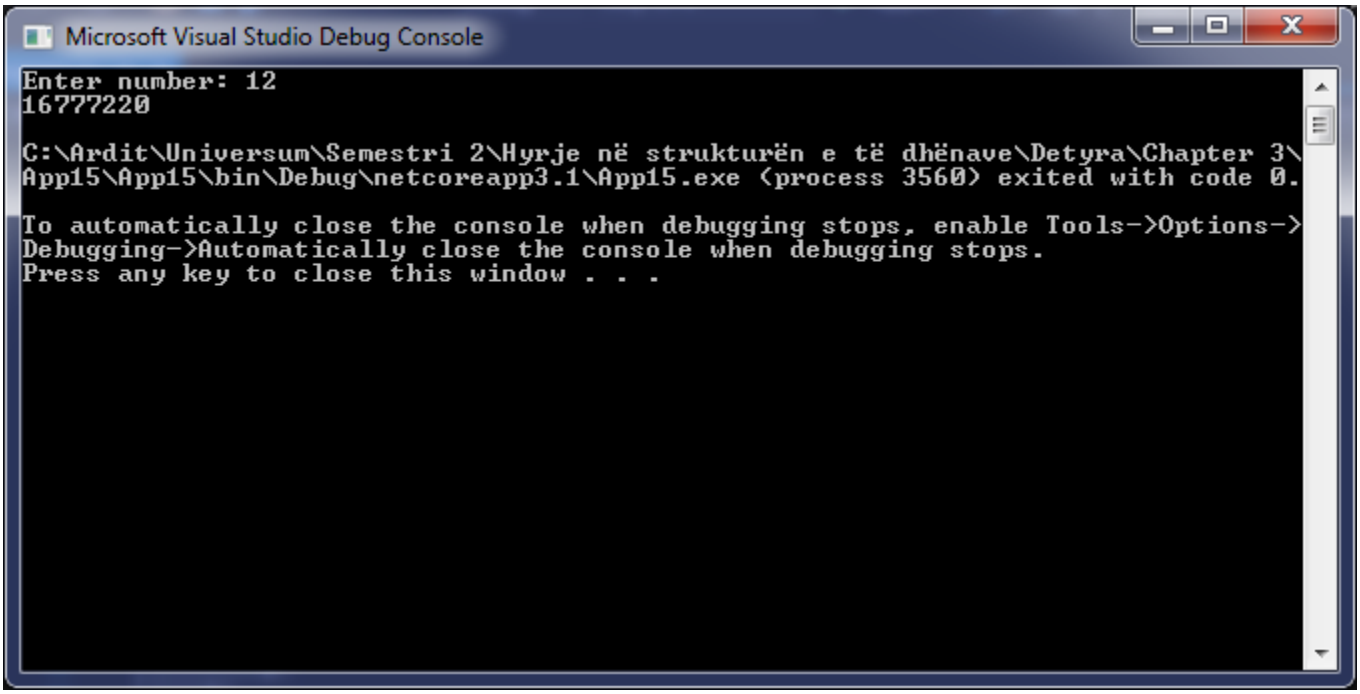
14. Write a program that checks if a given number n (1 < n < 100) is a prime number (i.e. it is divisible without remainder only to itself and 1).

```
using System;

namespace App14
{
    class Program
    {
        static void Main(string[] args)
        {
            int number = 72;
            bool isPrime = true;
            if (number > 2)
                for (int i = 2; i <= Math.Ceiling(Math.Sqrt(number)); ++i)
                {
                    if (number % i == 0) isPrime = false;
                }
            Console.WriteLine("{0} is prime?: {1}", number, isPrime);
        }
    }
}
```



15. * Write a program that exchanges the values of the bits on positions 3, 4 and 5 with bits on positions 24, 25 and 26 of a given 32-bit unsigned integer.

```
using System;

namespace App15
{
    class Program
    {
        static void Main(string[] args)
        {
            Console.Write("Enter number: ");
            int v = Convert.ToInt32(Console.ReadLine());
            int mask = 1 << 3;
            int bitAt3 = (v & mask) != 0 ? 1 : 0;
            mask = 1 << 4;
            int bitAt4 = (v & mask) != 0 ? 1 : 0;
            mask = 1 << 5;
            int bitAt5 = (v & mask) != 0 ? 1 : 0;
            mask = 1 << 24;
            int bitAt24 = (v & mask) != 0 ? 1 : 0;
            mask = 1 << 25;
            int bitAt25 = (v & mask) != 0 ? 1 : 0;
            mask = 1 << 26;
            int bitAt26 = (v & mask) != 0 ? 1 : 0;

            v = (bitAt3 == 0) ? v = v & (~(1 << 24)) : v = v | (1 << 24);
            v = (bitAt4 == 0) ? v = v & (~(1 << 25)) : v = v | (1 << 25);
            v = (bitAt5 == 0) ? v = v & (~(1 << 26)) : v = v | (1 << 26);
            v = (bitAt24 == 0) ? v = v & (~(1 << 3)) : v = v | (1 << 3);
            v = (bitAt25 == 0) ? v = v & (~(1 << 4)) : v = v | (1 << 4);
            v = (bitAt26 == 0) ? v = v & (~(1 << 5)) : v = v | (1 << 5);

            Console.WriteLine(v);
        }
    }
}
```



16. * Write a program that exchanges bits {p, p+1, …, p+k-1} with bits {q, q+1, …, q+k-1} of a given 32-bit unsigned integer.

```
using System;

namespace App16
{
    class Program
    {
        static void Main(string[] args)
        {
            int[] pBits = new int[k];
            int[] qBits = new int[k];

            for (int position = p, i = 0; i < pBits.Length; position++, i++)
            {
                pBits[i] = PthBit(number, position);
            }

            for (int position = q, i = 0; i < qBits.Length; position++, i++)
            {
                qBits[i] = PthBit(number, position);
            }

            for (int position = p, i = 0; i < qBits.Length; position++, i++)
            {
                number = ModifiedNumber(number, position, qBits[i]);
            }

            for (int position = q, i = 0; i < pBits.Length; position++, i++)
            {
                number = ModifiedNumber(number, position, pBits[i]);
            }
            return number;
        }

        private static int PthBit(uint number, int position)
        {
            uint pthBit = (number >> position) & 1;
            return (int)pthBit;
        }

        private static uint ModifiedNumber(uint number, int position, int bitValue)
        {
            uint actualP = (uint)bitValue << position;
            number = number & (~((uint)1 << position));
            uint result = number | actualP;
            return result;
        }

        static void Main(string[] args)
        {
            Console.Write("Enter number: ");
            uint number = uint.Parse(Console.ReadLine());
            Console.Write("Enter p: ");
            int p = int.Parse(Console.ReadLine());
            Console.Write("Enter q: ");
            int q = int.Parse(Console.ReadLine());
            Console.Write("Enter k: ");
            int k = int.Parse(Console.ReadLine());
```

```
            if (p > q)
            {
                int oldValue = p;
                p = q;
                q = oldValue;
            }

            if (p + k >= q)
            {
                k += p - q - 1;
                q += p + k + 1;
            }

            number = ModifyNumber(number, p, q, k);

            Console.WriteLine(number);
        }
    }
}
```