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

using System;

namespace Detyra1

{

class Program

{

static void Main(string[] args)

{

int num1 = 151, num2 = 35, num3 = 43, num4 = 251, num5 = 1023,

num6 = 1024;

string numBin1 = Convert.ToString(num1, 2);

string numBin2 = Convert.ToString(num2, 2);

string numBin3 = Convert.ToString(num3, 2);

string numBin4 = Convert.ToString(num4, 2);

string numBin5 = Convert.ToString(num5, 2);

string numBin6 = Convert.ToString(num6, 2);

Console.WriteLine("Number {0} in binary is {1}",num1,numBin1);

Console.WriteLine("Number {0} in binary is {1}",num2, numBin2);

Console.WriteLine("Number {0} in binary is {1}",num3, numBin3);

Console.WriteLine("Number {0} in binary is {1}",num4, numBin4);

Console.WriteLine("Number {0} in binary is {1}",num5, numBin5);

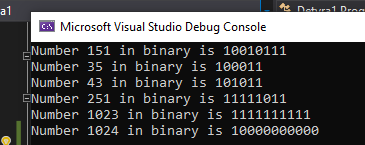
Console.WriteLine("Number {0} in binary is {1}",num6, numBin6);

Console.ReadKey();

}

}

}



1. Convert the number **1111010110011110(2)** to **hexadecimal** and **decimal** numeral systems.

using System;

namespace Detyra2

{

class Program

{

static void Main(string[] args)

{

string num = "1111010110011110";

long numDec = Convert.ToInt32(num, 2);

string numHex = Convert.ToInt32(num, 2).ToString("X");

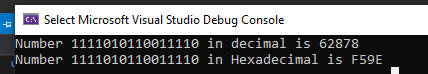
Console.WriteLine("Number {0} in decimal is {1}",num, numDec);

Console.WriteLine("Number {0} in Hexadecimal is {1}",num, numHex);

}

}

}



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

using System;

namespace Detyra3

{

class Program

{

static void Main(string[] args)

{

string num1 = "FA", num2 = "2A3E", num3 = "FFFF", num4 = "5A0E9";

int dec1 = Convert.ToInt32(num1, 16);

int dec2 = Convert.ToInt32(num2, 16);

int dec3 = Convert.ToInt32(num3, 16);

int dec4 = Convert.ToInt32(num4, 16);

string bin1 = Convert.ToString(Convert.ToInt32(num1, 16), 2);

string bin2 = Convert.ToString(Convert.ToInt32(num2, 16), 2);

string bin3 = Convert.ToString(Convert.ToInt32(num3, 16), 2);

string bin4 = Convert.ToString(Convert.ToInt32(num4, 16), 2);

Console.WriteLine("Hex Number {0} in decimal is {1}",num1, dec1);

Console.WriteLine("Hex Number {0} in decimal is {1}",num2, dec2);

Console.WriteLine("Hex Number {0} in decimal is {1}",num3, dec3);

Console.WriteLine("Hex Number {0} in decimal is {1}",num4, dec4);

Console.WriteLine("\nHex Number {0} in binary is {1}",num1, bin1);

Console.WriteLine("Hex Number {0} in binary is {1}",num2, bin2);

Console.WriteLine("Hex Number {0} in binary is {1}",num3, bin3);

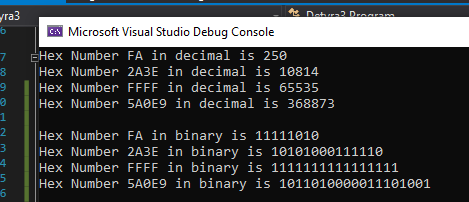
Console.WriteLine("Hex Number {0} in binary is {1}",num4, bin4);

Console.ReadKey();

}

}

}



4.    Write a program that converts a **decimal number to binary** one.

using System;

namespace Detyra4

{

class Program

{

static void Main(string[] args)

{

Console.Write("Enter a random number: ");

int num = int.Parse(Console.ReadLine());

string num1 = Convert.ToString(num, 2);

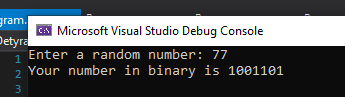
Console.WriteLine("Your number in binary is {0}",num1);

Console.ReadKey();

}

}

}



5.    Write a program that converts a **binary number to decimal** one.

using System;

namespace Detyra5

{

class Program

{

static void Main(string[] args)

{

Console.Write("Enter a binary number: ");

string num = Convert.ToString(Console.ReadLine());

int num1 = Convert.ToInt32(num, 2);

Console.WriteLine("Your binary {0} number convert to decimal is {1}"

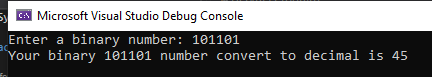
,num, num1);

Console.ReadKey();

}

}

}



6.    Write a program that converts a **decimal number to hexadecimal** one.

using System;

namespace Detyra6

{

class Program

{

static void Main(string[] args)

{

Console.Write("Enter a random number: ");

int num = int.Parse(Console.ReadLine());

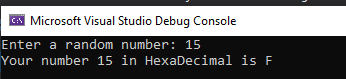
string numHex = num.ToString("X");

Console.WriteLine("Your number {0} in HexaDecimal is {1}",num , numHex);

}

}

}



7.    Write a program that converts a **hexadecimal number to decimal** one.

using System;

namespace Detyra8

{

class Program

{

static void Main(string[] args)

{

Console.Write("Enter a Hexadecimal Number: ");

string num = Convert.ToString(Console.ReadLine());

int num1 = Convert.ToInt32(num, 16);

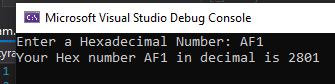
Console.WriteLine("Your Hex number {0} in decimal is {1}",num,num1);

Console.ReadKey();

}

}

}



8.    Write a program that converts a **hexadecimal number to binary** one.

using System;

namespace Detyra8

{

class Program

{

static void Main(string[] args)

{

Console.Write("Enter a Hexadecimal Number: ");

string num = Convert.ToString(Console.ReadLine());

string num1 = Convert.ToString(Convert.ToInt32(num, 16), 2);

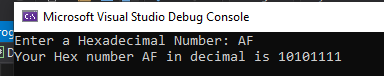
Console.WriteLine("Your Hex number {0} in binary is {1}",num,num1);

Console.ReadKey();

}

}

}



9.    Write a program that converts a **binary number to hexadecimal** one.

using System;

namespace Detyra9

{

class Program

{

static void Main(string[] args)

{

Console.Write("Enter a binary number:");

string num = Console.ReadLine();

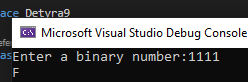
string numHex = Convert.ToInt32(num, 2).ToString("X");

Console.WriteLine(numHex);

}

}

}



10.   Write a program that converts a **binary number to decimal** using the Horner scheme.

using System;

namespace Detyra10

{

class Program

{

static void Main(string[] args)

{

Console.Write("Enter a binary number:");

string num = Console.ReadLine();

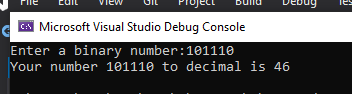
int num1 = Convert.ToInt32(num, 2);

Console.WriteLine("Your number {0} to decimal is {1}", num,num1);

}

}

}



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

using System;

namespace Detyra\_11

{

class Program

{

static void Main(string[] args)

{

int result = 0;

Console.Write("Enter Roman number: ");

String s = Console.ReadLine();

string[] chars = s.Select(c => c.ToString()).ToArray();

for (int i = 0; i < chars.Length; i++)

{

if (chars[i] == "m" || chars[i] == "M") result += 1000;

if (chars[i] == "d" || chars[i] == "D") result += 500;

if (chars[i] == "c" || chars[i] == "C")

{

result += 100;

if (i < chars.Length - 1)

{

if (chars[i + 1] == "d" || chars[i + 1] == "D") result -= 200;

if (chars[i + 1] == "m" || chars[i + 1] == "M") result -= 200;

}

}

if (chars[i] == "l" || chars[i] == "L") result += 50;

if (chars[i] == "x" || chars[i] == "X")

{

result += 10;

if (i < chars.Length - 1)

{

if (chars[i + 1] == "l" || chars[i + 1] == "L") result -= 20;

if (chars[i + 1] == "c" || chars[i + 1] == "C") result -= 20;

}

}

if (chars[i] == "v" || chars[i] == "V") result += 5;

if (chars[i] == "i" || chars[i] == "I")

{

result++;

if (i < chars.Length - 1)

{

if (chars[i + 1] == "v" || chars[i + 1] == "V") result -= 2;

if (chars[i + 1] == "x" || chars[i + 1] == "X") result -= 2;

}

}

}

Console.WriteLine("Arabic number is " + result);

}

}

}

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

using System;

namespace Detyra\_12

{

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);

}

}

13.   Write a program that by given **N**, **S**, **D** (**2** **≤** **S**, **D** **≤** **16**) converts the number **N** from an **S**-based numeral system to a **D**based numeral system.

using System;

namespace Detyra\_13

{

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);

}

}

}

14.   Try **adding up 50,000,000 times the number 0.000001**. Use a loop and addition (not direct multiplication). Try it with **float** and **double** and after that with **decimal**. Do you notice the **huge difference in the results** and speed of calculation? Explain what happens.

15.   \* Write a program that prints the value of the **mantissa**, the **sign of the mantissa** and **exponent** in **float** numbers (32-bit numbers with a floating-point according to the **IEEE 754** standard). Example: for the number **-27.25** should be printed: **sign** = **1**, **exponent** = **10000011**, **mantissa** = **10110100000000000000000**.