**Chapter 8. Numeral Systems**

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)

{

Console.WriteLine("151 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));

Console.WriteLine("1023 to binary {0}.", Convert.ToString(1023, 2));

Console.WriteLine("1024 to binary {0}.", Convert.ToString(1024, 2));

}

}

}

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

using System;

namespace detyra2

{

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"));

}

}

}

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

using System;

namespace detyra3

{

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");

}

}

}

1. Xx-----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 decimal number: ");

int deci = Int32.Parse(Console.ReadLine());

Console.WriteLine("{0} to binary is {1}.",deci, deci.ToString(deci, 2));

}

}

}

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 binary number: ");

string binary = Console.ReadLine();

Console.WriteLine("{0} to decimal is {1}.",

binary, Convert.ToInt64(binary, 2));

}

}

}

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 decimal number: ");

int deci = Int32.Parse(Console.ReadLine());

Console.WriteLine("{0} to hexadecimal is {1}.",

deci, deci.ToString("X"));

}

}

}

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

namespace detyra7

{

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));

}

}

}

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 hexadecimal number: ");

string hexa = Console.ReadLine();

Console.WriteLine("{0} to binary is {1}.",

hexa, Convert.ToString(Convert.ToInt32(hexa, 16), 2));

}

}

}

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 binary number: ");

string binary = Console.ReadLine();

Console.WriteLine("{0} to hexadecimal is {1}.",

binary, Convert.ToInt32(binary, 2).ToString("X"));

}

}

}

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)

{

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);

}

}

}

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

using System;

namespace detyra11

{

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 detyra12

{

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 converts the number N from an S-based numeral system to a D based numeral system.

using System;

namespace detyra13

{

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);

}

}

}