C# Chapter 8

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

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));  
}

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

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"));  
}

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

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

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));  
}

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

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));  
}

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

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"));  
}

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

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));  
}

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

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));  
}

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

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");  
}

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

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

namespace Chapter\_8\_Solution\_10

{

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);

}

}

}

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

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

namespace RomanToArabic

{

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);

}

}

}

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

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

namespace ArabitToRoman

{

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;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

namespace Chapter\_8\_Solution\_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);

}

}

}