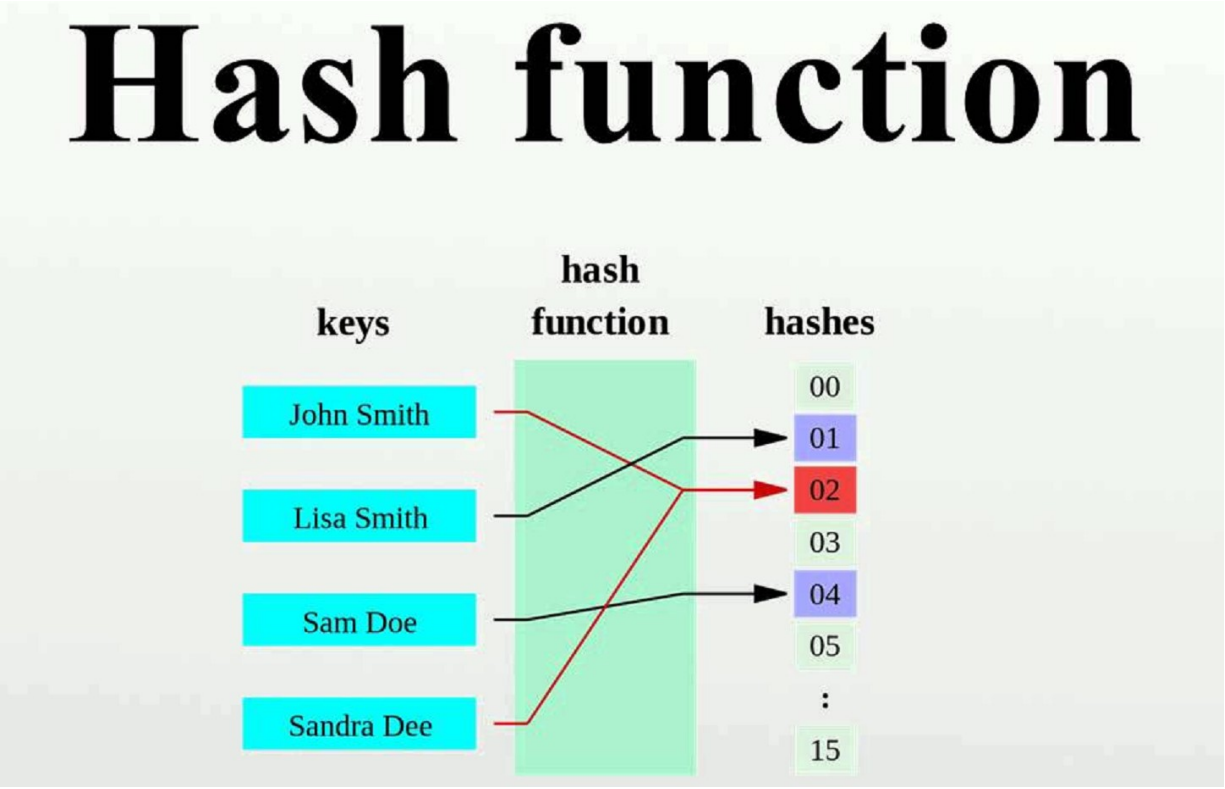
**ITIS-LS "Francesco Giordani" Caserta**

**prof. Ennio Ranucci**

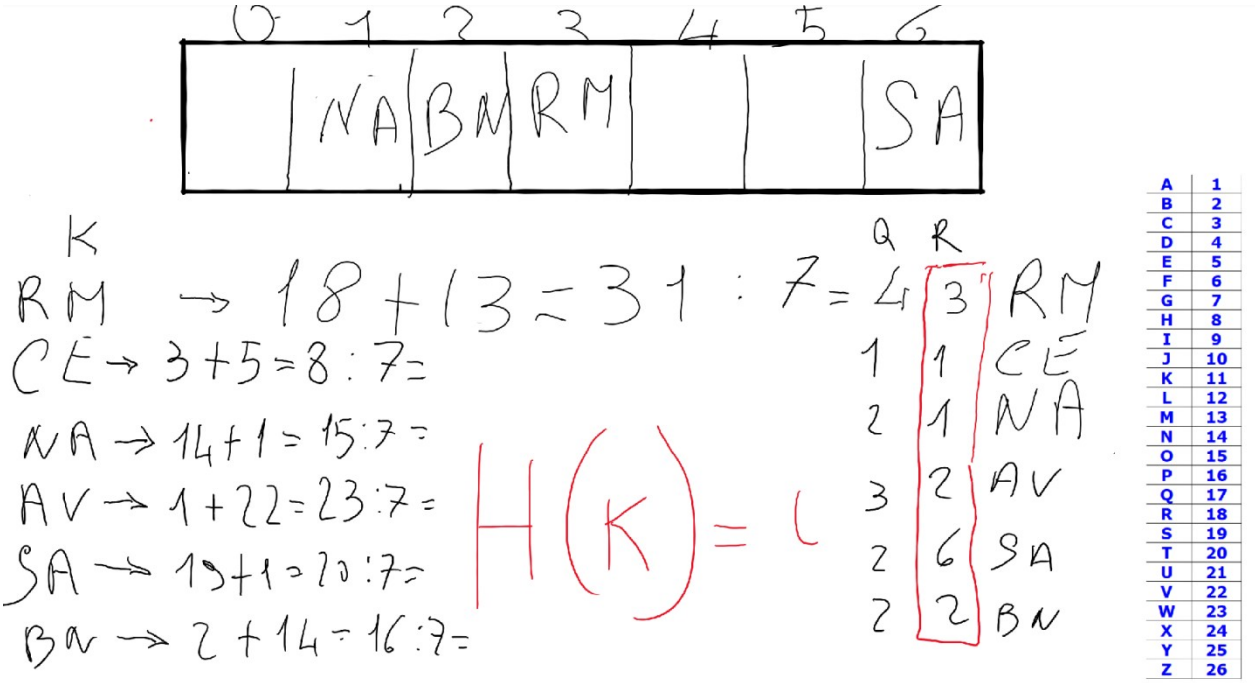
**a.s. 2020-2021**

# *Accesso a trasformazione di chiave - esercitazioni*

C++ C#



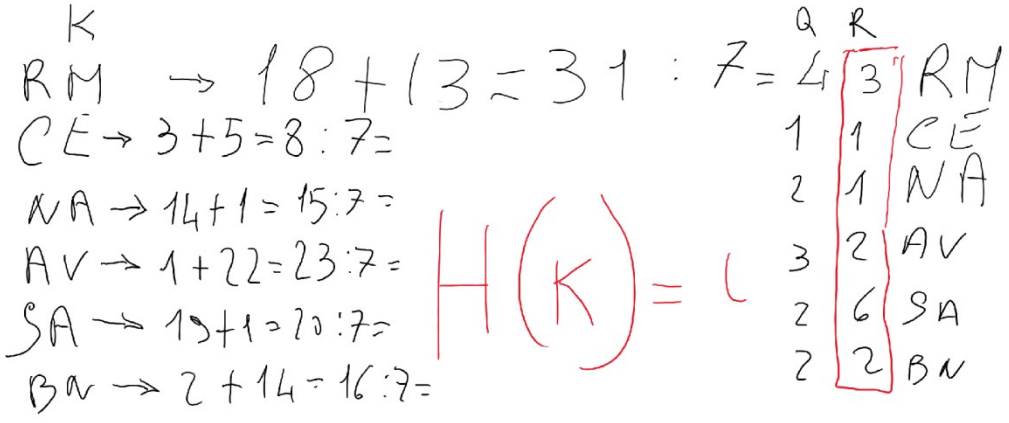
**ITIS-LS "Francesco Giordani" Caserta**
**Anno scolastico:** 2020/2021
**Classe 4^ sez.C spec. Informatica e telecomunicazioni**
**Data:** dicembre 2020
**Numero progressivo dell'esercizio:** es1
**Versione:** 1.0
**Programmatore/i:**
**Sistema Operativo:** Windows 10
**Compilatore/Interprete:** C++
**Obiettivo didattico:** L'alunno affronta le problematiche dell'accesso mirato mediante funzione Hash
**Obiettivo del programma:** Scrivere il codice C++ per "Memorizzare in un vettore le chiavi RM, CE,NA,AV,SA,BN con il metodo del resto della divisione.




```
#include <iostream>
#include <string>
using namespace std;

string vet[7];
string k[2];
int Hash(string kPar);


void scriviChiave(string kPar);
void leggiVet();
```

```
int main()
{
   scriviChiave("rm");
   scriviChiave("ce");
   scriviChiave("na");
   scriviChiave("av");
   scriviChiave("sa");
   scriviChiave("bn");
   leggiVet();
   return 0;
}

int Hash(string kPar)
{
   int posizione;
   posizione=int(kPar[0]-96)+ int(kPar[1]-96);
   return posizione % 7;
}

void leggiVet()
 {
   for (int i=0;i<7;i++)      cout <<i<<" "<< vet[i]<<" "<<endl;
 }
void scriviChiave(string kPar)
{
   int pos=Hash(kPar);
   vet[pos]=kPar;
}
```

**ITIS-LS "Francesco Giordani" Caserta**
**Anno scolastico:** 2020/2021
**Classe 4^ sez.C spec. Informatica e telecomunicazioni**
**Data:**
**Numero progressivo dell'esercizio:** es2
**Versione:** 1.0
**Programmatore/i:**
**Sistema Operativo:** Windows 10
**Compilatore/Interprete:** C++
**Obiettivo didattico:** L'alunno affronta le problematiche dell'accesso mirato mediante funzione Hash
**Obiettivo del programma:** Scrivere il codice C++ per "Memorizzare in un vettore le chiavi RM, CE,NA,AV,SA,BN con il metodo del resto della divisione e, in caso di collisione, applicare il metodo della scansione lineare"

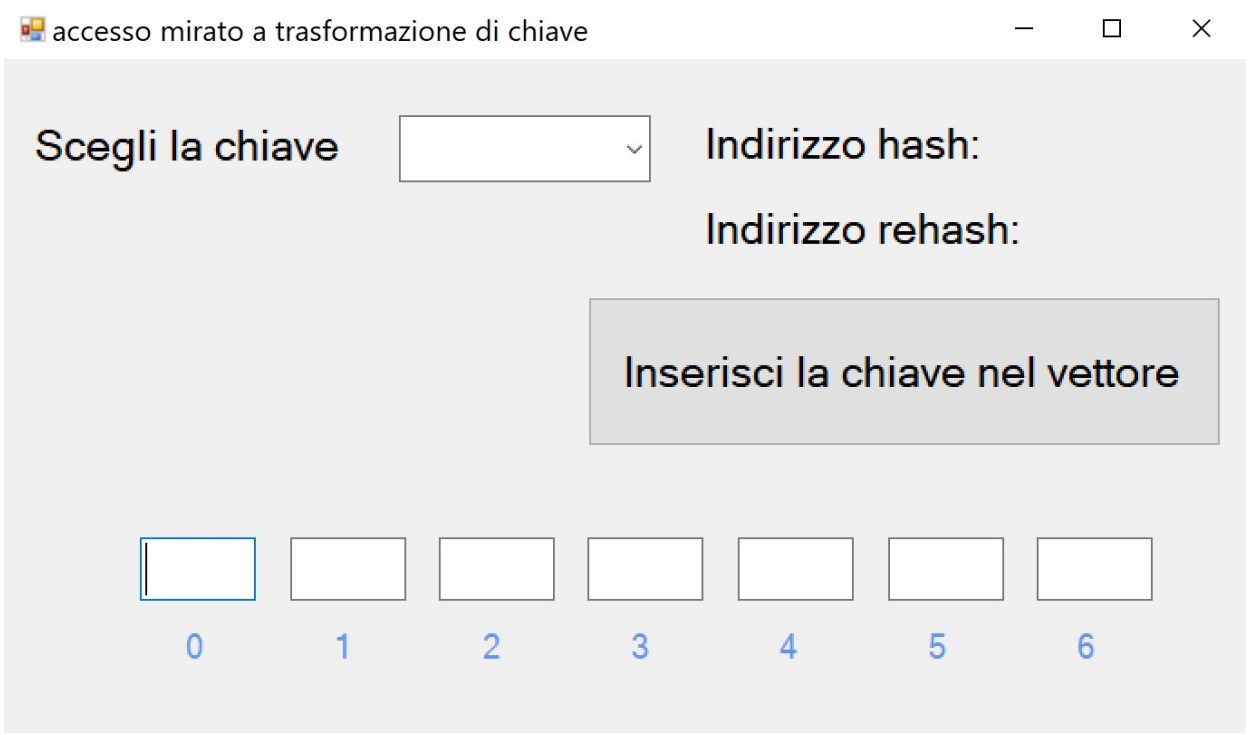




| | |
|---|---|
| A | 1 |
| B | 2 |
| C | 3 |
| D | 4 |
| E | 5 |
| F | 6 |
| G | 7 |
| H | 8 |
| I | 9 |
| J | 10 |
| K | 11 |
| L | 12 |
| M | 13 |
| N | 14 |
| O | 15 |
| P | 16 |
| Q | 17 |
| R | 18 |
| S | 19 |
| T | 20 |
| U | 21 |
| V | 22 |
| W | 23 |
| X | 24 |
| Y | 25 |
| Z | 26 |

```
#include <iostream>
#include <string>
using namespace std;

string vet[7]={"0","0","0","0","0","0","0"};
string k[2];
int Hash(string kPar);
int rehash(int collisionePar);
int rehashLineare(int posPar);
void scriviChiave(string kPar);
void leggiVet();
```

```
int main()
{
   scriviChiave("rm");    scriviChiave("ce");
   scriviChiave("na");    scriviChiave("av");
   scriviChiave("sa");    scriviChiave("bn");
   leggiVet();
   return 0;
}

int Hash(string kPar)
{
   int posizione;
   posizione=int(kPar[0]-96)+ int(kPar[1]-96);
   return posizione % 7;
}
int rehashLineare(int posPar)
{
   if (posPar==6) return 0;
     else
       return posPar=posPar+1;
}
void leggiVet()
 {
   for (int i=0;i<7;i++)
      cout <<i<<" "<< vet[i]<<" "<<endl;
 }
void scriviChiave(string kPar)
{
  int pos;
   bool collisione=true;
   pos=Hash(kPar);
  do
   {
     if (vet[pos]=="0")
       {
         vet[pos]=kPar;
         collisione=false;
       }
       else
         pos=rehashLineare(pos);
   }
   while(collisione==true);
}
```

**ITIS-LS "Francesco Giordani" Caserta**
**Anno scolastico:** 2020/2021
**Classe 4^ sez.C spec. Informatica e telecomunicazioni**
**Data:**
**Numero progressivo dell'esercizio:** es3
**Versione:** 1.0
**Programmatore/i:**
**Sistema Operativo:** Windows 10
**Compilatore/Interprete:** C#
**Obiettivo didattico:** L'alunno affronta le problematiche dell'accesso mirato mediante funzione Hash
**Obiettivo del programma:** Scrivere il codice C# per "Memorizzare in un vettore le chiavi RM, CE,NA,AV,SA,BN con il metodo del resto della divisione e, in caso di collisione, applicare il metodo della scansione lineare"




**MainForm.cs**

```
/*
 * Created by SharpDevelop.
 * User: ennio
 * Date: 13/12/2020
 * Time: 09:07
 *
```

```
 * To change this template use Tools | Options | Coding | Edit Standard Headers.
 */
using System;
using System.Collections.Generic;
using System.Drawing;
using System.Windows.Forms;

namespace accesso_mirato_a_trasformazione_di_chiave
{
	/// <summary>
	/// Description of MainForm.
	/// </summary>
	public partial class MainForm : Form
	{
		string[] vet = new string[7] {"0","0","0","0","0","0","0"};
		public MainForm()
		{
			//
			// The InitializeComponent() call is required for Windows Forms designer support.
			//
			InitializeComponent();
			cboSceltaChiave.Items.Add("rm");
			cboSceltaChiave.Items.Add("ce");
			cboSceltaChiave.Items.Add("na");
			cboSceltaChiave.Items.Add("av");
			cboSceltaChiave.Items.Add("bn");
			cboSceltaChiave.Items.Add("sa");
```

```
                }
                int Hash(string kPar)
  {
    int posizione;
    posizione=(int)kPar[0]-96+ (int)kPar[1]-96;
    return posizione % 7;
  }
int rehashLineare(int posPar)
  {
     if (posPar==6) return 0;
     else
       return posPar=posPar+1;
  }

                void BtnInserisciChiaveClick(object sender, EventArgs e)
                {
                  int pos,i=0;
  bool collisione=true;
  string kPar=cboSceltaChiave.SelectedItem.ToString();
  pos=Hash(kPar);
  lblIndirizzoHash.Text=pos.ToString();
  lblIndirizzoRehash.Text="";
  do
   {

    if (vet[pos]=="0")
      {
```

```
            vet[pos]=kPar;
            collisione=false;
          }
         else
         {
           pos=rehashLineare(pos);
           lblIndirizzoRehash.Text=pos.ToString();
         }
         i++;
         if (i==6) MessageBox.Show("Vettore pieno");
       }
     while(collisione==true && i<=6);
     txtPos0.Text=vet[0];
     txtPos1.Text=vet[1];
     txtPos2.Text=vet[2];
     txtPos3.Text=vet[3];
     txtPos4.Text=vet[4];
     txtPos5.Text=vet[5];
     txtPos6.Text=vet[6];
                }
       }
}
```

**MainForm.Designer.cs**

```
/*
 * Created by SharpDevelop.
 * User: ennio
 * Date: 13/12/2020
 * Time: 09:07
```

```
 *
 * To change this template use Tools | Options | Coding | Edit Standard Headers.
 */
namespace accesso_mirato_a_trasformazione_di_chiave
{
    partial class MainForm
    {
        /// <summary>
        /// Designer variable used to keep track of non-visual components.
        /// </summary>
        private System.ComponentModel.IContainer components = null;
        private System.Windows.Forms.Label lblScegliChiave;
        private System.Windows.Forms.TextBox txtPos0;
        private System.Windows.Forms.TextBox txtPos1;
        private System.Windows.Forms.TextBox txtPos2;
        private System.Windows.Forms.TextBox txtPos3;
        private System.Windows.Forms.TextBox txtPos4;
        private System.Windows.Forms.TextBox txtPos5;
        private System.Windows.Forms.TextBox txtPos6;
        private System.Windows.Forms.Label lblPos0;
        private System.Windows.Forms.Label lbl1;
        private System.Windows.Forms.Label lbl2;
        private System.Windows.Forms.Label lblPos3;
        private System.Windows.Forms.Label lblPos4;
        private System.Windows.Forms.Label lblPos5;
        private System.Windows.Forms.Label lblPos6;
        private System.Windows.Forms.Button btnInserisciChiave;
        private System.Windows.Forms.ComboBox cboSceltaChiave;
```

```
		private System.Windows.Forms.Label lblIndirizzoHashEtichetta;
		private System.Windows.Forms.Label lblIndirizzoHash;
		private System.Windows.Forms.Label lblIndirizzoRehashEtichetta;
		private System.Windows.Forms.Label lblIndirizzoRehash;

		/// <summary>
		/// Disposes resources used by the form.
		/// </summary>
		/// <param name="disposing">true if managed resources should be disposed; otherwise,
false.</param>
		protected override void Dispose(bool disposing)
		{
			if (disposing) {
				if (components != null) {
					components.Dispose();
				}
			}
			base.Dispose(disposing);
		}

		/// <summary>
		/// This method is required for Windows Forms designer support.
		/// Do not change the method contents inside the source code editor. The Forms designer
might
		/// not be able to load this method if it was changed manually.
		/// </summary>
		private void InitializeComponent()
		{
			this.lblScegliChiave = new System.Windows.Forms.Label();
```

```
            this.txtPos0 = new System.Windows.Forms.TextBox();
            this.txtPos1 = new System.Windows.Forms.TextBox();
            this.txtPos2 = new System.Windows.Forms.TextBox();
            this.txtPos3 = new System.Windows.Forms.TextBox();
            this.txtPos4 = new System.Windows.Forms.TextBox();
            this.txtPos5 = new System.Windows.Forms.TextBox();
            this.txtPos6 = new System.Windows.Forms.TextBox();
            this.lblPos0 = new System.Windows.Forms.Label();
            this.lbl1 = new System.Windows.Forms.Label();
            this.lbl2 = new System.Windows.Forms.Label();
            this.lblPos3 = new System.Windows.Forms.Label();
            this.lblPos4 = new System.Windows.Forms.Label();
            this.lblPos5 = new System.Windows.Forms.Label();
            this.lblPos6 = new System.Windows.Forms.Label();
            this.btnInserisciChiave = new System.Windows.Forms.Button();
            this.cboSceltaChiave = new System.Windows.Forms.ComboBox();
            this.lblIndirizzoHashEtichetta = new System.Windows.Forms.Label();
            this.lblIndirizzoHash = new System.Windows.Forms.Label();
            this.lblIndirizzoRehashEtichetta = new System.Windows.Forms.Label();
            this.lblIndirizzoRehash = new System.Windows.Forms.Label();
            this.SuspendLayout();
            //
            // lblScegliChiave
            //
            this.lblScegliChiave.Font = new System.Drawing.Font("Microsoft Sans Serif", 18F,
System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(0)));
            this.lblScegliChiave.Location = new System.Drawing.Point(23, 63);
            this.lblScegliChiave.Name = "lblScegliChiave";
```

```
            this.lblScegliChiave.Size = new System.Drawing.Size(416, 68);
            this.lblScegliChiave.TabIndex = 0;
            this.lblScegliChiave.Text = "Scegli la chiave";
            //
            // txtPos0
            //
            this.txtPos0.Font = new System.Drawing.Font("Microsoft Sans Serif", 18F,
System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(0)));
            this.txtPos0.Location = new System.Drawing.Point(150, 508);
            this.txtPos0.Name = "txtPos0";
            this.txtPos0.Size = new System.Drawing.Size(124, 62);
            this.txtPos0.TabIndex = 2;
            //
            // txtPos1
            //
            this.txtPos1.Font = new System.Drawing.Font("Microsoft Sans Serif", 18F,
System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(0)));
            this.txtPos1.Location = new System.Drawing.Point(315, 508);
            this.txtPos1.Name = "txtPos1";
            this.txtPos1.Size = new System.Drawing.Size(124, 62);
            this.txtPos1.TabIndex = 3;
            //
            // txtPos2
            //
            this.txtPos2.Font = new System.Drawing.Font("Microsoft Sans Serif", 18F,
System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(0)));
            this.txtPos2.Location = new System.Drawing.Point(480, 508);
            this.txtPos2.Name = "txtPos2";
            this.txtPos2.Size = new System.Drawing.Size(124, 62);
```

```
            this.txtPos2.TabIndex = 4;
            //
            // txtPos3
            //
            this.txtPos3.Font = new System.Drawing.Font("Microsoft Sans Serif", 18F,
System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(0)));
            this.txtPos3.Location = new System.Drawing.Point(645, 508);
            this.txtPos3.Name = "txtPos3";
            this.txtPos3.Size = new System.Drawing.Size(124, 62);
            this.txtPos3.TabIndex = 5;
            //
            // txtPos4
            //
            this.txtPos4.Font = new System.Drawing.Font("Microsoft Sans Serif", 18F,
System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(0)));
            this.txtPos4.Location = new System.Drawing.Point(810, 508);
            this.txtPos4.Name = "txtPos4";
            this.txtPos4.Size = new System.Drawing.Size(124, 62);
            this.txtPos4.TabIndex = 6;
            //
            // txtPos5
            //
            this.txtPos5.Font = new System.Drawing.Font("Microsoft Sans Serif", 18F,
System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(0)));
            this.txtPos5.Location = new System.Drawing.Point(975, 508);
            this.txtPos5.Name = "txtPos5";
            this.txtPos5.Size = new System.Drawing.Size(124, 62);
            this.txtPos5.TabIndex = 7;
            //
```

```
            // txtPos6
            //
            this.txtPos6.Font = new System.Drawing.Font("Microsoft Sans Serif", 18F,
System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(0)));
            this.txtPos6.Location = new System.Drawing.Point(1140, 508);
            this.txtPos6.Name = "txtPos6";
            this.txtPos6.Size = new System.Drawing.Size(124, 62);
            this.txtPos6.TabIndex = 8;
            //
            // lblPos0
            //
            this.lblPos0.Font = new System.Drawing.Font("Microsoft Sans Serif", 13.875F,
System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(0)));
            this.lblPos0.ForeColor = System.Drawing.Color.CornflowerBlue;
            this.lblPos0.Location = new System.Drawing.Point(192, 600);
            this.lblPos0.Name = "lblPos0";
            this.lblPos0.Size = new System.Drawing.Size(47, 55);
            this.lblPos0.TabIndex = 9;
            this.lblPos0.Text = "0";
            //
            // lbl1
            //
            this.lbl1.Font = new System.Drawing.Font("Microsoft Sans Serif", 13.875F,
System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(0)));
            this.lbl1.ForeColor = System.Drawing.Color.CornflowerBlue;
            this.lbl1.Location = new System.Drawing.Point(356, 600);
            this.lbl1.Name = "lbl1";
            this.lbl1.Size = new System.Drawing.Size(47, 55);
            this.lbl1.TabIndex = 10;
```

```
            this.lbl1.Text = "1";
            //
            // lbl2
            //
            this.lbl2.Font = new System.Drawing.Font("Microsoft Sans Serif", 13.875F,
System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(0)));
            this.lbl2.ForeColor = System.Drawing.Color.CornflowerBlue;
            this.lbl2.Location = new System.Drawing.Point(520, 600);
            this.lbl2.Name = "lbl2";
            this.lbl2.Size = new System.Drawing.Size(47, 55);
            this.lbl2.TabIndex = 11;
            this.lbl2.Text = "2";
            //
            // lblPos3
            //
            this.lblPos3.Font = new System.Drawing.Font("Microsoft Sans Serif", 13.875F,
System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(0)));
            this.lblPos3.ForeColor = System.Drawing.Color.CornflowerBlue;
            this.lblPos3.Location = new System.Drawing.Point(684, 600);
            this.lblPos3.Name = "lblPos3";
            this.lblPos3.Size = new System.Drawing.Size(47, 55);
            this.lblPos3.TabIndex = 12;
            this.lblPos3.Text = "3";
            //
            // lblPos4
            //
            this.lblPos4.Font = new System.Drawing.Font("Microsoft Sans Serif", 13.875F,
System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(0)));
            this.lblPos4.ForeColor = System.Drawing.Color.CornflowerBlue;
```

```
            this.lblPos4.Location = new System.Drawing.Point(848, 600);
            this.lblPos4.Name = "lblPos4";
            this.lblPos4.Size = new System.Drawing.Size(47, 55);
            this.lblPos4.TabIndex = 13;
            this.lblPos4.Text = "4";
            //
            // lblPos5
            //
            this.lblPos5.Font = new System.Drawing.Font("Microsoft Sans Serif", 13.875F,
System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(0)));
            this.lblPos5.ForeColor = System.Drawing.Color.CornflowerBlue;
            this.lblPos5.Location = new System.Drawing.Point(1012, 600);
            this.lblPos5.Name = "lblPos5";
            this.lblPos5.Size = new System.Drawing.Size(47, 55);
            this.lblPos5.TabIndex = 14;
            this.lblPos5.Text = "5";
            //
            // lblPos6
            //
            this.lblPos6.Font = new System.Drawing.Font("Microsoft Sans Serif", 13.875F,
System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(0)));
            this.lblPos6.ForeColor = System.Drawing.Color.CornflowerBlue;
            this.lblPos6.Location = new System.Drawing.Point(1176, 600);
            this.lblPos6.Name = "lblPos6";
            this.lblPos6.Size = new System.Drawing.Size(47, 55);
            this.lblPos6.TabIndex = 15;
            this.lblPos6.Text = "6";
            //
            // btnInserisciChiave
```

```
            //
            this.btnInserisciChiave.Font = new System.Drawing.Font("Microsoft Sans Serif",
18F, System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(0)));
            this.btnInserisciChiave.Location = new System.Drawing.Point(645, 251);
            this.btnInserisciChiave.Name = "btnInserisciChiave";
            this.btnInserisciChiave.Size = new System.Drawing.Size(700, 160);
            this.btnInserisciChiave.TabIndex = 16;
            this.btnInserisciChiave.Text = "Inserisci la chiave nel vettore";
            this.btnInserisciChiave.UseVisualStyleBackColor = true;
            this.btnInserisciChiave.Click += new
System.EventHandler(this.BtnInserisciChiaveClick);
            //
            // cboSceltaChiave
            //
            this.cboSceltaChiave.Font = new System.Drawing.Font("Microsoft Sans Serif", 18F,
System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(0)));
            this.cboSceltaChiave.FormattingEnabled = true;
            this.cboSceltaChiave.Location = new System.Drawing.Point(436, 60);
            this.cboSceltaChiave.Name = "cboSceltaChiave";
            this.cboSceltaChiave.Size = new System.Drawing.Size(274, 63);
            this.cboSceltaChiave.TabIndex = 17;
            //
            // lblIndirizzoHashEtichetta
            //
            this.lblIndirizzoHashEtichetta.Font = new System.Drawing.Font("Microsoft Sans
Serif", 18F, System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(0)));
            this.lblIndirizzoHashEtichetta.Location = new System.Drawing.Point(764, 62);
            this.lblIndirizzoHashEtichetta.Name = "lblIndirizzoHashEtichetta";
            this.lblIndirizzoHashEtichetta.Size = new System.Drawing.Size(344, 60);
            this.lblIndirizzoHashEtichetta.TabIndex = 18;
```

```
            this.lblIndirizzoHashEtichetta.Text = "Indirizzo hash:";
            //
            // lblIndirizzoHash
            //
            this.lblIndirizzoHash.Font = new System.Drawing.Font("Microsoft Sans Serif", 18F,
System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(0)));
            this.lblIndirizzoHash.Location = new System.Drawing.Point(1138, 63);
            this.lblIndirizzoHash.Name = "lblIndirizzoHash";
            this.lblIndirizzoHash.Size = new System.Drawing.Size(164, 49);
            this.lblIndirizzoHash.TabIndex = 19;
            //
            // lblIndirizzoRehashEtichetta
            //
            this.lblIndirizzoRehashEtichetta.Font = new System.Drawing.Font("Microsoft Sans
Serif", 18F, System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(0)));
            this.lblIndirizzoRehashEtichetta.Location = new System.Drawing.Point(764, 152);
            this.lblIndirizzoRehashEtichetta.Name = "lblIndirizzoRehashEtichetta";
            this.lblIndirizzoRehashEtichetta.Size = new System.Drawing.Size(380, 60);
            this.lblIndirizzoRehashEtichetta.TabIndex = 20;
            this.lblIndirizzoRehashEtichetta.Text = "Indirizzo rehash:";
            //
            // lblIndirizzoRehash
            //
            this.lblIndirizzoRehash.Font = new System.Drawing.Font("Microsoft Sans Serif",
18F, System.Drawing.FontStyle.Regular, System.Drawing.GraphicsUnit.Point, ((byte)(0)));
            this.lblIndirizzoRehash.Location = new System.Drawing.Point(1176, 152);
            this.lblIndirizzoRehash.Name = "lblIndirizzoRehash";
            this.lblIndirizzoRehash.Size = new System.Drawing.Size(164, 49);
            this.lblIndirizzoRehash.TabIndex = 21;
```

```
//
// MainForm
//
this.AutoScaleDimensions = new System.Drawing.SizeF(12F, 25F);
this.AutoScaleMode = System.Windows.Forms.AutoScaleMode.Font;
this.ClientSize = new System.Drawing.Size(1415, 716);
this.Controls.Add(this.lblIndirizzoRehash);
this.Controls.Add(this.lblIndirizzoRehashEtichetta);
this.Controls.Add(this.lblIndirizzoHash);
this.Controls.Add(this.lblIndirizzoHashEtichetta);
this.Controls.Add(this.cboSceltaChiave);
this.Controls.Add(this.btnInserisciChiave);
this.Controls.Add(this.lblPos6);
this.Controls.Add(this.lblPos5);
this.Controls.Add(this.lblPos4);
this.Controls.Add(this.lblPos3);
this.Controls.Add(this.lbl2);
this.Controls.Add(this.lbl1);
this.Controls.Add(this.lblPos0);
this.Controls.Add(this.txtPos6);
this.Controls.Add(this.txtPos5);
this.Controls.Add(this.txtPos4);
this.Controls.Add(this.txtPos3);
this.Controls.Add(this.txtPos2);
this.Controls.Add(this.txtPos1);
this.Controls.Add(this.txtPos0);
this.Controls.Add(this.lblScegliChiave);
this.Name = "MainForm";
```

```
            this.Text = "accesso mirato a trasformazione di chiave";
            this.ResumeLayout(false);
            this.PerformLayout();

        }
        }
}
```