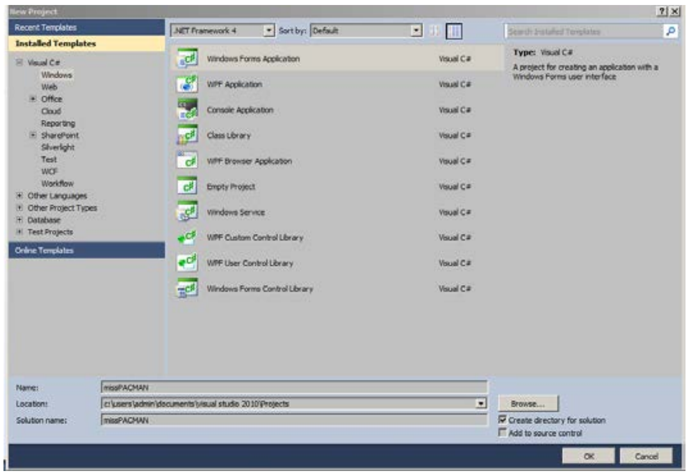
C# Tutorial - Create a simple PAC MAN game in Visual Studio

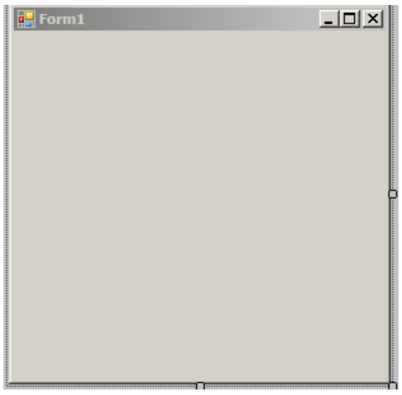
start a new project

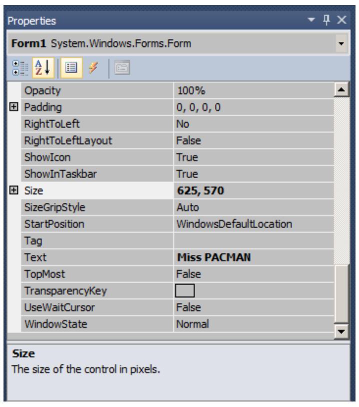
Choose windows form application (visual C#)

Name it missPACMAN and Click OK


New Project
Recent Templates
Installed Templates
Visual C#
Windows
Web
Office
Cloud
Reporting
SharePoint
Silverlight
Test
WCF
Workflow
Other Languages
Other Project Types
Database
Test Projects
Online Templates
.NET Framework 4
Sort by: Default
Search Installed Templates
Windows Forms Application Visual C#
WPF Application Visual C#
Console Application Visual C#
Class Library Visual C#
WPF Browser Application Visual C#
Empty Project Visual C#
Windows Service Visual C#
WPF Custom Control Library Visual C#
WPF User Control Library Visual C#
Windows Forms Control Library Visual C#
Type: Visual C#
A project for creating an application with a Windows Forms user interface
Browse...
Create directory for solution
Add to source control
OK
Cancel

Name: missPACMAN
Location: c:\users\admin\documents\visual studio 2010\Projects
Solution name: missPACMAN




Properties

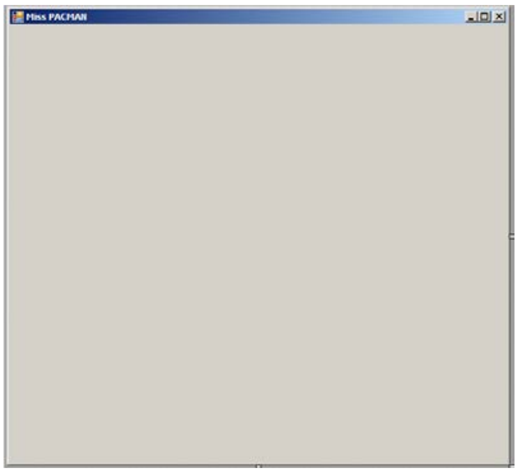
Form1 System.Windows.Forms.Form

Opacity	100%
Padding	0, 0, 0, 0
RightToLeft	No
RightToLeftLayout	False
ShowIcon	True
ShowInTaskbar	True
Size	**625, 570**
SizeGripStyle	Auto
StartPosition	WindowsDefaultLocation
Tag	
Text	**Miss PACMAN**
TopMost	False
TransparencyKey	
UseWaitCursor	False
WindowState	Normal

Size
The size of the control in pixels.

In the form properties change the following
SIze - 625, 570
Text - Miss PACMAN
Since we are going to use the miss pacman animated gif in the game its only fitting that we name it Miss Pacman.

Notice after doing the above the size of the form and title text will change.

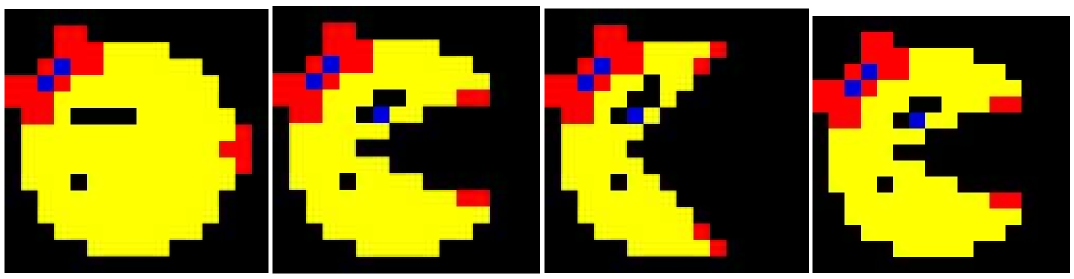


Rules of the Game -

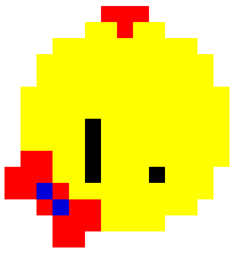
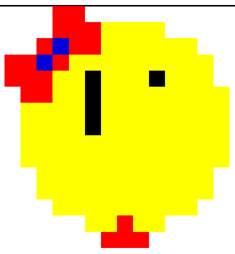
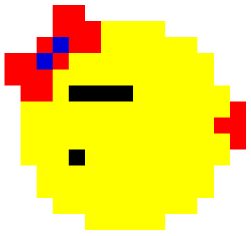
1. Player can move up down left and right
2. Player will collect coins - collect all coin and you WIN the game
3. Player cannot touch Wall or Ghost. If they do GAME OVER
4. 2 (Red and Yellow)ghost will have static left to right movement
5. 1 (PINK) ghost will have a random movement which will scale across the form.
6. When the game is over there will be a game over text or when the player won the game it will show You WIN.

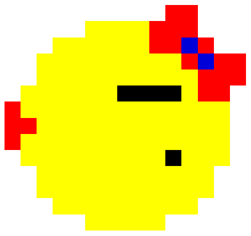
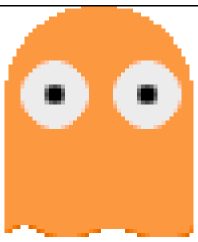
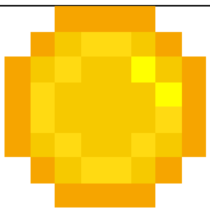
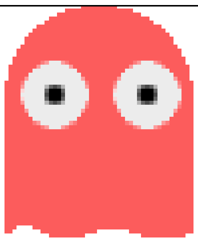
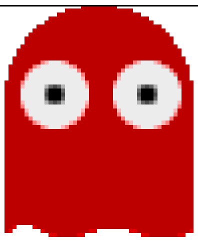
Since we have a player who can move left right up and down, therefore we have created a pac man image which is rotated left right up and down. This is the main reason we picked Miss Pacman because she has a bow and beauty spot which is distinctive enough to recognise which way is which.

Pacman GIF is the sequence of images below



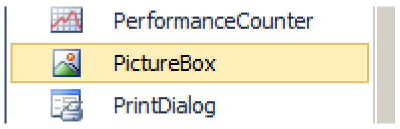
They will all play together, and making it look like the games original player.

Game Assets	Description
	This is the up directional image we named this file up.GIF since they all are animated GIF files. Download the resource from above the tutorial or get it from **MOOICT.COM**
	This is the down directional image named down.GIF
	This is the right directional image named right.GIF

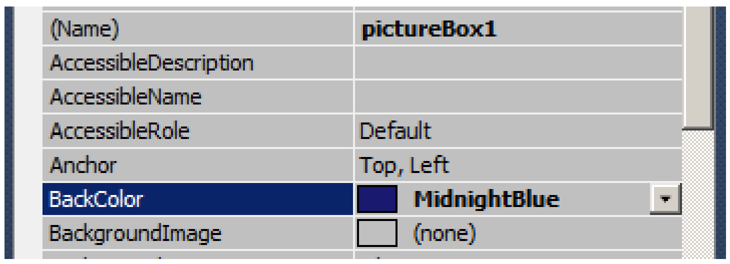
	This is the left directional image named left.GIF
	This is the orange ghost
	This is the rotating coin This image will be multiplied and spread across the form. Once the player has collected them all they win the game.
	This is the crazy pink ghost who will haunt your dreams.
	This is the red ghost image.

Making The walls

We will be using 5 picture boxes for the walls.

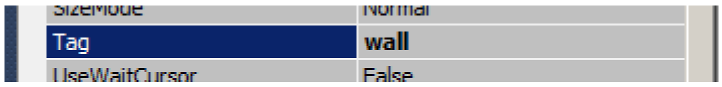


Find the picture box component in the tool box and drag and drop it to the form.



(Name)	pictureBox1
AccessibleDescription	
AccessibleName	
AccessibleRole	Default
Anchor	Top, Left
BackColor	MidnightBlue
BackgroundImage	(none)

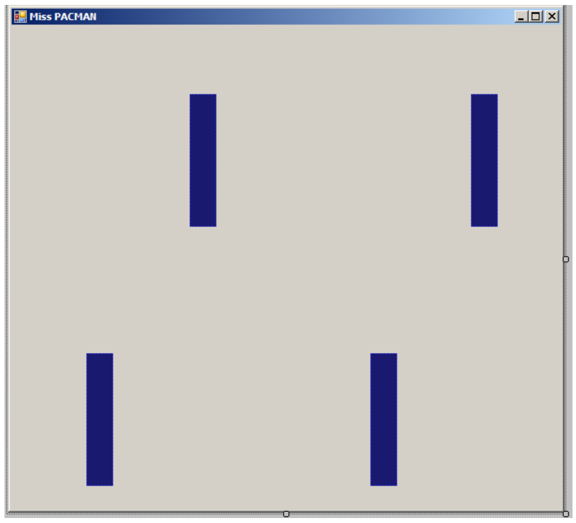
In the properties window of the picture box find the option **BackColor** and change it to **MidNight Blue**.



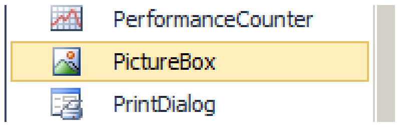
SizeMode	Normal
Tag	wall
UseWaitCursor	False

There is also a very important option called **TAG**. Enter **wall** for this option. Make sure its lower case.

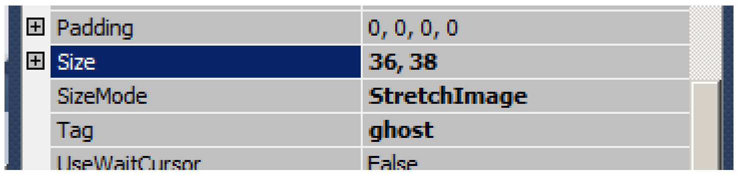
now copy and paste it 4 times until it looks like below



Now its time to make the ghosts.



Drag and drop another picture box to the screen.

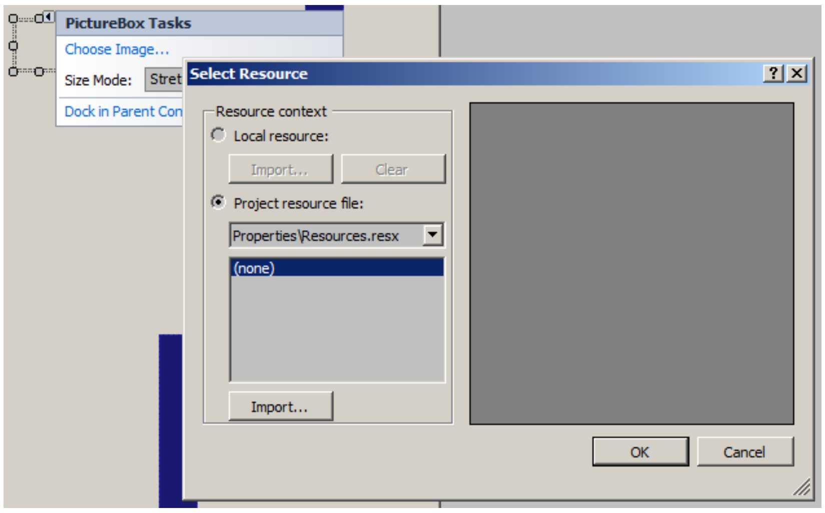


Padding	0, 0, 0, 0
Size	36, 38
SizeMode	StretchImage
Tag	ghost
UseWaitCursor	False

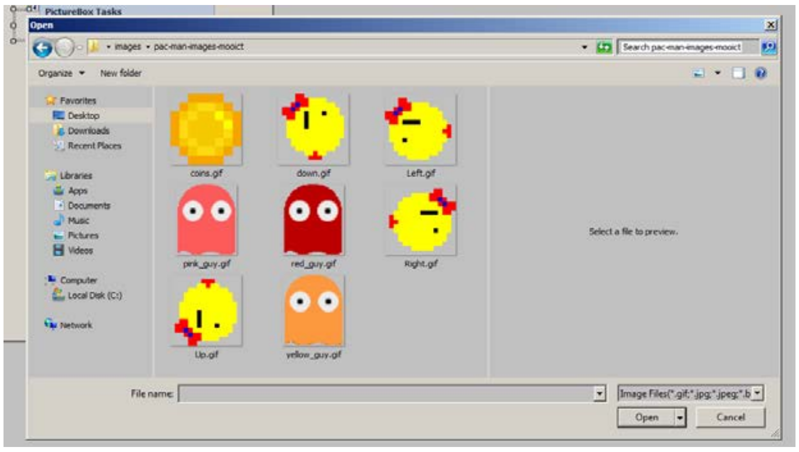
Change the **size to 36, 38**, Size mode to **stretch image** and tag to **ghost**.

Now we need to import all of the images from our assets folder to the project. In order to do so, click on the small triangle on the top right corner of the small picture box and click on Choose Image.

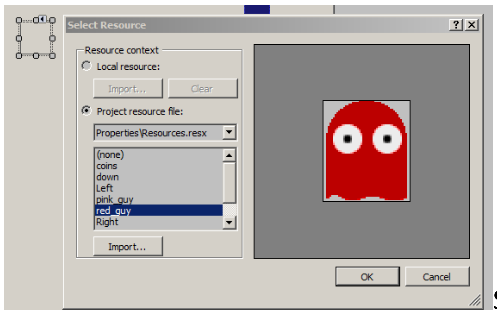
Make sure the project resource file is selected and click on IMPORT



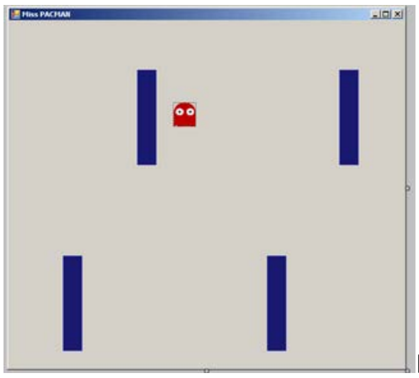
Once you clicked on import find the folder with all of the images in it.



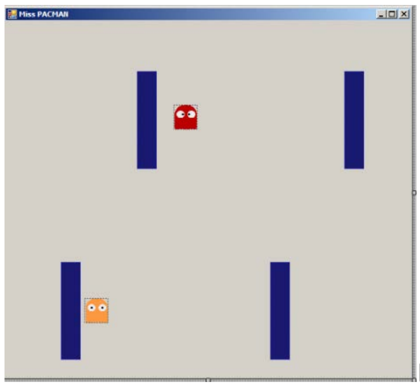
Select all images and click OPEN



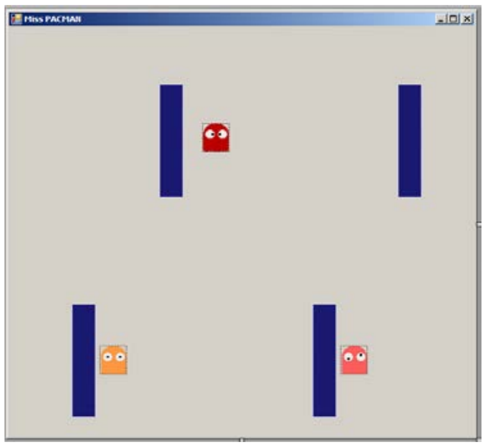
Select the red guy from the image list. and CLICK OK



Make a copy of the red guy, follow the same steps to change it to the yellow guy and place him between the bottom walls.

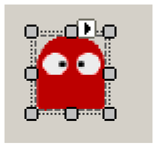
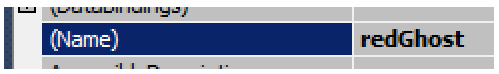


Now we have two ghosts, time for the crazy pink one. Now you can make the final copy of the ghost and change the image to the pink ghost.



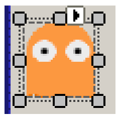
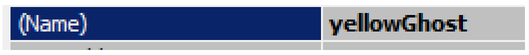
All done placing the ghosts, now its time to make some changes to the properties of the ghost picture boxes.

Click on the red guy first


change name option in the properties window to redGhost


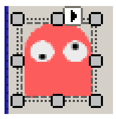
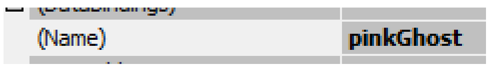
(Name)	redGhost

Click on the yellow guy


change the name in the properties window to yellowGhost


(Name)	yellowGhost

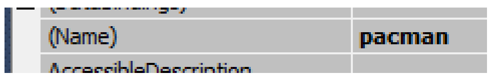
Now on the pink guy


change the name in the properties window to pinkGhost


(Name)	pinkGhost

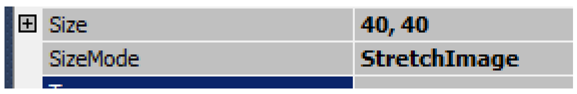
Now to create the pac man

Drag and drop a new picture box to the form. Click on it and change the following in the properties window



(Name)	pacman

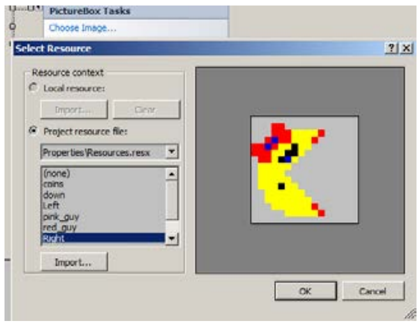
Name it pacman



Size	40, 40
SizeMode	StretchImage

size -- 40,40 and size mode stretch image.

Change the image to right

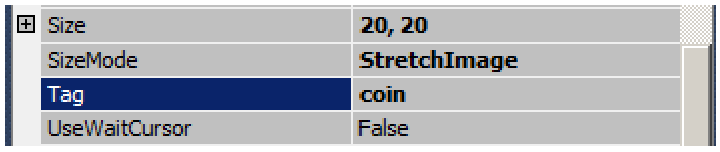


Click OK.

Good thing we imported all of them AM I RIGHT.

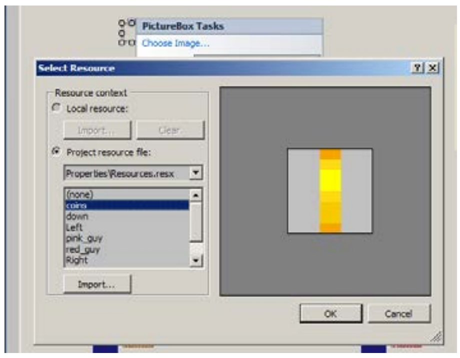
Finally we need to create the coin

Once again drag and drop another picture box to the form.

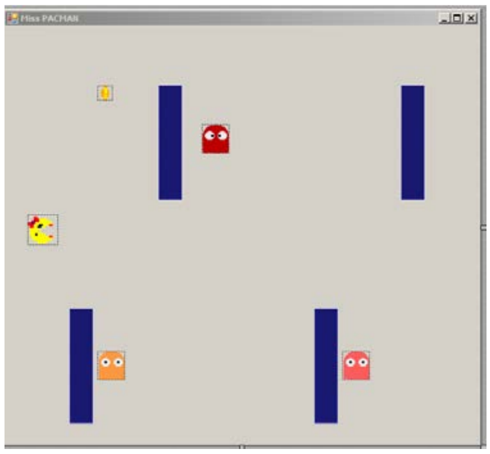


Size	20, 20
SizeMode	StretchImage
Tag	coin
UseWaitCursor	False

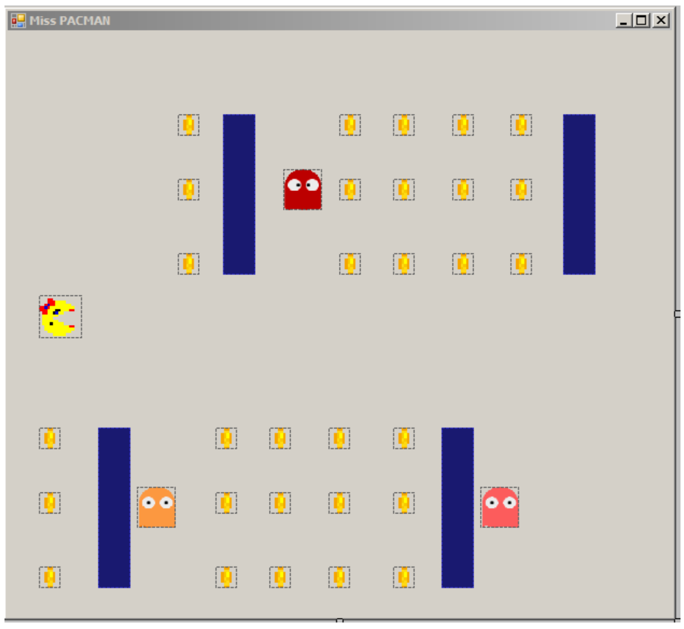
Change the size to 20,20. Change the size mode to Stretch Image and apply a tag "coin" to this picture box.



Select the coin image and Click OK

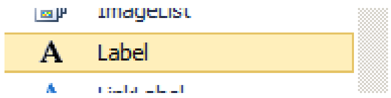


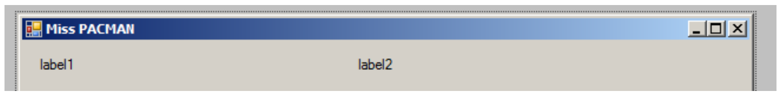
now you can copy and paste as many coins as you like. let's do 30.



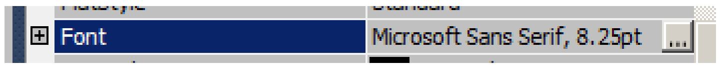
This will do.

Now we need to two labels to the form.

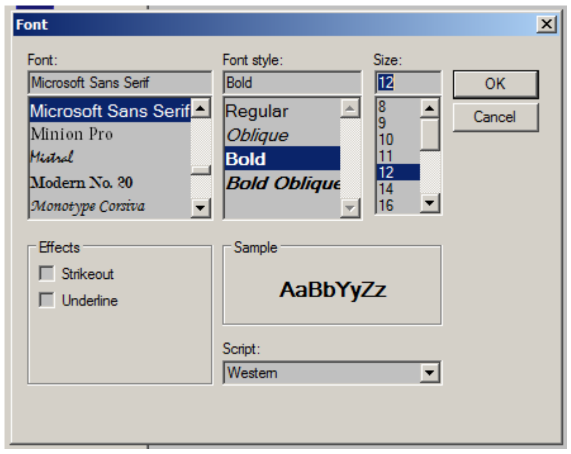




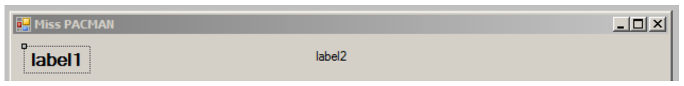
Click on label 1 and check the properties window for the FONT option. Click on the ... three dots to the right.


Font: Microsoft Sans Serif, 8.25pt

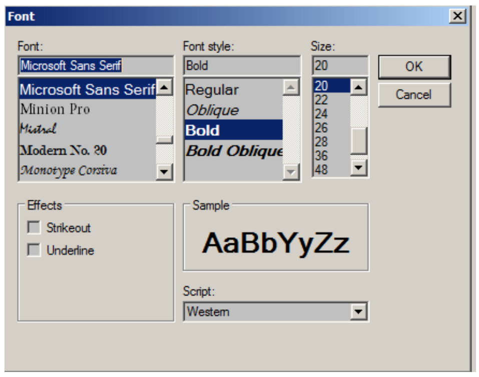
It will open this window and apply these changes to Label 1


Font: Microsoft Sans Serif
Font style: Bold
Size: 12

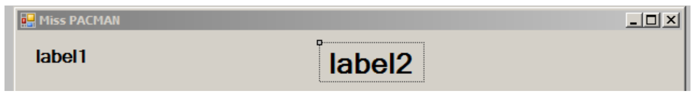
BOLD and Size 12 CLICK ok



Now click on Label 2 and apply the following changes

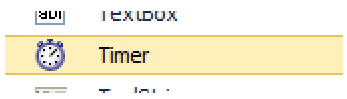

Font: Microsoft Sans Serif
Font style: Bold
Size: 20

BOLD, SIZE 20

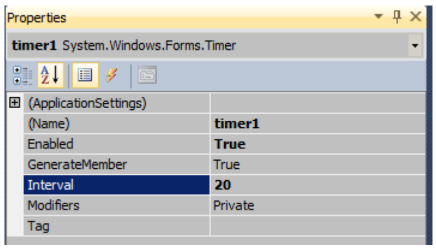


Now for the final component TIMER

Find the timer component in the tool box



Drag and drop the timer on the form.

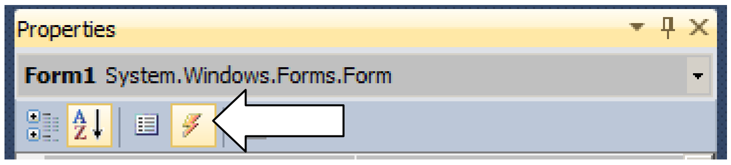

Properties
timer1 System.Windows.Forms.Timer

(ApplicationSettings)	
(Name)	timer1
Enabled	True
GenerateMember	True
Interval	20
Modifiers	Private
Tag	

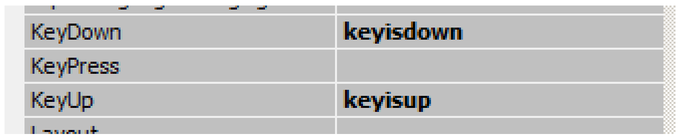
Click on the Timer and apply the changes, **Enabled TRUE** and **Interval to 20**.

Adding Events to the game

Click on the form and look at the form properties window.


Properties
Form1 System.Windows.Forms.Form

Click on the lightning bolt icon on the form.

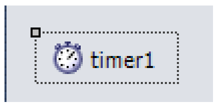


KeyDown	keyisdown
KeyPress	
KeyUp	keyisup

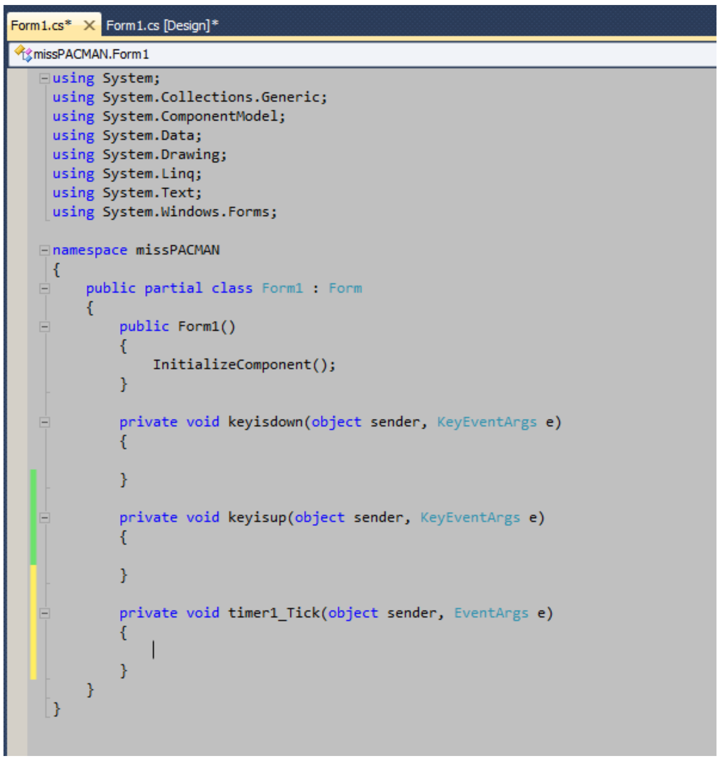
Find the key down and key up events and type in the following event names. Each time you type in the name it will take you to the code view, make sure to come back to the design view and type the keyisup event.

We need one more event for our game and its not in the list here.

Double click on the timer icon on bottom of the form.



Double click this



```
using System;
using System.Collections.Generic;
using System.ComponentModel;
using System.Data;
using System.Drawing;
using System.Linq;
using System.Text;
using System.Windows.Forms;

namespace missPACMAN
{
    public partial class Form1 : Form
    {
        public Form1()
        {
            InitializeComponent();
        }

        private void keyisdown(object sender, KeyEventArgs e)
        {

        }

        private void keyisup(object sender, KeyEventArgs e)
        {

        }

        private void timer1_Tick(object sender, EventArgs e)
        {
            |
        }
    }
}
```

We have 3 total events in this now, **keyisdown**, **keyisup** and **timer1_Tick**

```
using System;
using System.Collections.Generic;
using System.ComponentModel;
using System.Data;
using System.Drawing;
using System.Linq;
using System.Text;
using System.Windows.Forms;

namespace missPACMAN
{
    public partial class Form1 : Form
    {
        // start the variables

        bool goup;
        bool godown;
        bool goleft;
        bool goright;


        int speed = 5;

        //ghost 1 and 2 variables. These guys are sane well sort of
        int ghost1 = 8;
        int ghost2 = 8;

        //ghost 3 crazy variables
        int ghost3x = 8;
        int ghost3y = 8;

        int score = 0;
        // end of listing variables

        public Form1()
        {
            InitializeComponent();
            label2.visible = false;
        }

        private void keyisdown(object sender, KeyEventArgs e)
        {

        }

        private void keyisup(object sender, KeyEventArgs e)
        {

        }

        private void timer1_Tick(object sender, EventArgs e)
        {

        }
    }
}
```

Add the highlighted code above the Form1() function. These are the global variables we will need for this game.

bool goup is a Boolean. This can either be true or false. There are 4 Booleans all together, we are going to use them to detect whether the player should go in one of 4 directions.

int speed is the speed integer. This variable contains numbers and it only holds the number 5. This will be used as the speed which our player moves across the game.

int ghost1 is the red ghosts speed. int ghost2 is the yellow ghost speed. Since they will only move in one direction we don't two variables for them.

int ghost3x is the X direction or horizontal directional speed for the pink ghost.

int ghost2y is the Y direction or vertical directional speed for the pink ghost.

int score is the integer which will keep track of the score in which the player collections the coins and it will increase by 1. We gave it default value of 0.

```
label2.visible = false;
```

This line above is big label we added earlier, this will show when the game is over, either when the player touched the wall or the ghosts or when the player collected all of the coins.

KEYISDOWN function

`private void keyisdown(object sender, KeyEventArgs e)`
`        {`
`          if (e.KeyCode == Keys.Left)`
`            {`
`                goleft = true;`
`                pacman.Image = Properties.Resources.Left;`
`            }`
 	
`            if (e.KeyCode == Keys.Right)`
`            {`
	In this function we are tracking 4 keys. Up, down, let and right. When either of these keys are pressed by the user we change the directional images of pacman dynamically so resemble the movement.
	
	IF key code is LEFT
	Go left is set to true
	Change pac man image to LEFT

```
                goright = true;

                pacman.Image = Properties.Resources.Right;
            }
            if (e.KeyCode == Keys.Up)
            {

                goup = true;
                pacman.Image = Properties.Resources.Up;
            }
            if (e.KeyCode == Keys.Down)
            {

                godown = true;
                pacman.Image = Properties.Resources.down;
            }
        }
```

IF key code is RIGHT
Go right is set to true
Change pac man image to RIGHT

IF key code is UP
Go up is set to true
Change pac man image to UP

IF key code is DOWN
Go down is set to true
Change pac man image to down

Make sure you pay attention to the if statement curly brackets

```
IF (condition goes here)
{ <-- open curly bracket
  Instructions here
} <-- close curly bracket
```

KEYISUP function

```
private void keyisup(object sender, KeyEventArgs e)
        {
            if (e.KeyCode == Keys.Left)
            {
                goleft = false;
            }

            if (e.KeyCode == Keys.Right)
            {
                goright = false;
            }
            if (e.KeyCode == Keys.Up)
            {
                goup = false;
            }
            if (e.KeyCode == Keys.Down)
            {
                godown = false;
            }
        }
```

In this key up function we are checking for the left, right, up and down keys again.
Once the user has pressed them and left them we can turn those Booleans to false.

The idea is PACMAN should only move when the keys are down not up.

TIMER1_TICK function

```
private void timer1_Tick(object sender, EventArgs e)
       {
            label1.Text = "Score: " + score;
// show the score on the board
```

This is the timer function. This is the main function or event that makes our game run.

First we are going to link the score integer to the label 1. We are calling label 1 text property and adding the score variable to it. So when the player gets a point it will update it.

```
            //player movement codes start
            if (goleft)
            {
                pacman.Left -= speed;
                //moving player to the left.
            }
            if (goright)
            {
                pacman.Left += speed;
```

This is where the player is moving. The reason we used Booleans is because when the Boolean is true we can move the player and when its false it will stop.

To go left we are going to set the pacmans left property of the picture box minus equals to the speed

```
                //moving player to the right
            }
            if (goup)
            {
                pacman.Top -= speed;
                //moving to the top
            }

            if (godown)
            {
                pacman.Top += speed;
                //moving down
            }
            //player movements code end
```

variable.

By taking away the 5 each time the timer runs from left of the picture box we are going to dynamically move it towards the left of the screen. Thats why we are using -= sign.

To go to the right we are going to plus equals to speed variable.

To go up we are using the pacmans top property and taking away 5 each time it runs. The speed variable contains the number 5.

To go down we are adding 5 each time it runs.

```
            //moving ghosts and bumping with the walls
            redGhost.Left += ghost1;
            yellowGhost.Left += ghost2;
```

Got the red ghost and yellow ghost we are assigning a += to their respective variable.

```
// if the red ghost hits the picture box 4 then we reverse the speed
if (redGhost.Bounds.IntersectsWith(pictureBox4.Bounds))
            {
                ghost1 = -ghost1;
            }
// if the red ghost hits the picture box 3 we reverse the speed
else if (redGhost.Bounds.IntersectsWith(pictureBox3.Bounds))
            {
                ghost1 = -ghost1;
            }
```

Since we want the ghosts to bump into the wall and go the other way we are going to use the bounds property. With this we can check if the ghost hit the wall and we will change the positive ghost1 variable to negative ghost1 variable so it will go left instead of right after it hit the wall.

```
// if the yellow ghost hits the picture box 1 then we reverse the speed
if (yellowGhost.Bounds.IntersectsWith(pictureBox1.Bounds))
            {
                ghost2 = -ghost2;
            }
// if the yellow chost hits the picture box 2 then we reverse the speed
else if (yellowGhost.Bounds.IntersectsWith(pictureBox2.Bounds))
            {
                ghost2 = -ghost2;
            }
//moving ghosts and bumping with the walls end
```

We are doing the same for the yellow ghost. Once it hits the wall we will change the positive variable to negative and so on.

```
//for loop to check walls, ghosts and points
foreach (Control x in this.Controls)
            {
if (x is PictureBox && x.Tag == "wall" || x.Tag == "ghost")
                {
// checking if the player hits the wall or the ghost, then game is over
if (((PictureBox)x).Bounds.IntersectsWith(pacman.Bounds) || score == 30)
                    {
                        pacman.Left = 0;
                        pacman.Top = 25;
                        label2.Text = "GAME OVER";
                        label2.Visible = true;
                        timer1.Stop();
}
                }
if (x is PictureBox && x.Tag == "coin")
                {
//checking if the player hits the points picturebox then we can add to the score

if (((PictureBox)x).Bounds.IntersectsWith(pacman.Bounds))
                    {
                        this.Controls.Remove(x); //remove that point
                        score++; // add to the score
                    }
                }
            }

            // end of for loop checking walls, points and ghosts.
```

First we are running a foreach loop. Inside the loop we are giving the condition to loop through all of the controls in the form.

The loop always starts with the open curly brackets {
Then we are stating an if statement, in the statement we are looking for x variable which we declared on the loop earlier to see is X is a type of picture box and it has the tag of "wall" OR "ghost". Remember when it was mentioned the picture boxes tags are important, this is why.

Instead of listing through all of the picture boxes we are going to loop through all of them. Using a loop we can do more with less code.

If we hit any of the wall or ghost then we are re-arranging the pac mans position (left and top) and stopping the timer, then we are showing that GAME OVER text on the label 2.

We are also checking if the player has collected all of the coins and scored equals to 30.

To check if the player has hit one of the coins on screen we are doing the

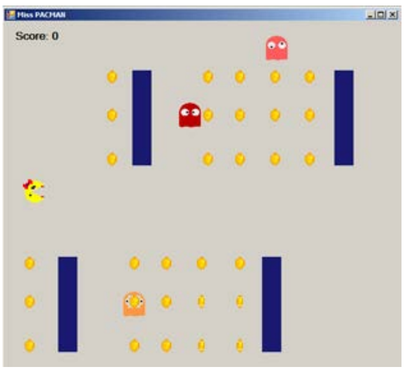
	same. We check if the player bounds intersects with coins then we remove that coin from the display and add one to screen.

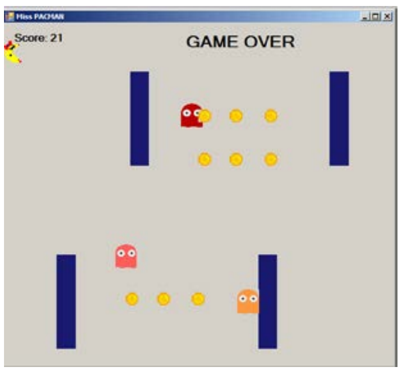
`//ghost 3 going crazy here`
`pinkGhost.Left += ghost3x;`
`pinkGhost.Top += ghost3y;`
	This is the crazy PINK ghost. The last two ghosts will go horizontally only but this one will bump across the whole screen. When we start we are increasing the LEFT and TOP.

`//ghost 3 bumping against the walls and form borders`
`if (pinkGhost.Left < 1 ||`
`pinkGhost.Left + pinkGhost.Width > ClientSize.Width - 2 ||`
` (pinkGhost.Bounds.IntersectsWith(pictureBox4.Bounds)) ||`
` (pinkGhost.Bounds.IntersectsWith(pictureBox3.Bounds)) ||`
` (pinkGhost.Bounds.IntersectsWith(pictureBox1.Bounds)) ||`
` (pinkGhost.Bounds.IntersectsWith(pictureBox2.Bounds)))`
`            {`
`                ghost3x = -ghost3x;`
`            }`
	In this LONG if statement we are checking whether the PINK ghost hits edge of screen OR the far end of the screen OR picture box 4 OR picture box 3 OR picture box 1 OR picture box 2 then we change the x direction of the PINK ghost.

`if (pinkGhost.Top < 1 || pinkGhost.Top + pinkGhost.Height > ClientSize.Height - 2)`
`            {`
`                ghost3y = -ghost3y;`
`            }`
`            // end of the crazy ghost movements`
`}`
	In this statement we are checking if the pink ghost hits the top or the bottom of the screen then we are bumping off the screen when it does.

Final Result





Its working. Happy Coding -

Full Code the game is below. Check and double check the code while working on it.

Keep learning and Moo On

```
using System;
using System.Collections.Generic;
using System.ComponentModel;
using System.Data;
using System.Drawing;
using System.Linq;
using System.Text;
using System.Windows.Forms;

namespace missPACMAN
{
    public partial class Form1 : Form
    {
        // start the variables

        bool goup;
        bool godown;
        bool goleft;
        bool goright;

        int speed = 5;

        //ghost 1 and 2 variables. These guys are sane well sort of
        int ghost1 = 8;
        int ghost2 = 8;

        //ghost 3 crazy variables
        int ghost3x = 8;
        int ghost3y = 8;

        int score = 0;

        // end of listing variables

        public Form1()
        {
            InitializeComponent();
            label2.Visible = false;
        }

        private void keyisdown(object sender, KeyEventArgs e)
        {
          if (e.KeyCode == Keys.Left)
            {
                goleft = true;
                pacman.Image = Properties.Resources.Left; // change the image to the right
            }

            if (e.KeyCode == Keys.Right)
            {
                goright = true;

                pacman.Image = Properties.Resources.Right; // change the image to the left
            }
            if (e.KeyCode == Keys.Up)
            {

                goup = true;
                pacman.Image = Properties.Resources.Up;
            }
            if (e.KeyCode == Keys.Down)
            {

                godown = true;
                pacman.Image = Properties.Resources.down;
            }
        }

        private void keyisup(object sender, KeyEventArgs e)
        {
            if (e.KeyCode == Keys.Left)
            {
                goleft = false;
            }

            if (e.KeyCode == Keys.Right)
            {
                goright = false;
            }
            if (e.KeyCode == Keys.Up)
            {
                goup = false;
            }
            if (e.KeyCode == Keys.Down)
            {
                godown = false;
            }
        }

        private void timer1_Tick(object sender, EventArgs e)
        {
            label1.Text = "Score: " + score; // show the score on the board

            //player movement codes start
            if (goleft)
            {
                pacman.Left -= speed;
                //moving player to the left.
            }
            if (goright)
            {
                pacman.Left += speed;
                //moving player to the right
            }
            if (goup)
            {
                pacman.Top -= speed;
                //moving to the top
            }

            if (godown)
            {
                pacman.Top += speed;
                //moving down
            }
            //player movements code end

            //moving ghosts and bumping witht he walls
            redGhost.Left += ghost1;
            yellowGhost.Left += ghost2;

            // if the red ghost hits the picture box 4 then we reverse the speed
            if (redGhost.Bounds.IntersectsWith(pictureBox4.Bounds))
            {
                ghost1 = -ghost1;
            }
            // if the red ghost hits the picture box 3 we reverse the speed
            else if (redGhost.Bounds.IntersectsWith(pictureBox3.Bounds))
            {
                ghost1 = -ghost1;
            }
            // if the yellow ghost hits the picture box 1 then we reverse the speed
            if (yellowGhost.Bounds.IntersectsWith(pictureBox1.Bounds))
            {
                ghost2 = -ghost2;
            }
            // if the yellow chost hits the picture box 2 then we reverse the speed
            else if (yellowGhost.Bounds.IntersectsWith(pictureBox2.Bounds))
            {
                ghost2 = -ghost2;
            }
            //moving ghosts and bumping with the walls end

            //for loop to check walls, ghosts and points
            foreach (Control x in this.Controls)
            {
                if (x is PictureBox && x.Tag =="wall" || x.Tag =="ghost")
                {
                    // checking if the player hits the wall or the ghost, then game is over
                    if (((PictureBox)x).Bounds.IntersectsWith(pacman.Bounds) || score == 30)
                    {
                        pacman.Left = 0;
                        pacman.Top = 25;
                        label2.Text = "GAME OVER";
                        label2.Visible = true;
                        timer1.Stop();

                    }
                }
                if (x is PictureBox && x.Tag == "coin")
                {
                    //checking if the player hits the points picturebox then we can add to the score
                    if (((PictureBox)x).Bounds.IntersectsWith(pacman.Bounds))
                    {
                        this.Controls.Remove(x); //remove that point
                        score++; // add to the score
                    }
                }
            }

            // end of for loop checking walls, points and ghosts.

            //ghost 3 going crazy here
            pinkGhost.Left += ghost3x;
            pinkGhost.Top += ghost3y;

            if (pinkGhost.Left < 1 ||
                pinkGhost.Left + pinkGhost.Width > ClientSize.Width - 2 ||
                (pinkGhost.Bounds.IntersectsWith(pictureBox4.Bounds)) ||
                (pinkGhost.Bounds.IntersectsWith(pictureBox3.Bounds)) ||
                (pinkGhost.Bounds.IntersectsWith(pictureBox1.Bounds)) ||
                (pinkGhost.Bounds.IntersectsWith(pictureBox2.Bounds))
                )
            {
                ghost3x = -ghost3x;
            }
            if (pinkGhost.Top < 1 || pinkGhost.Top + pinkGhost.Height > ClientSize.Height - 2)
            {
                ghost3y = -ghost3y;
            }
            // end of the crazy ghost movements
        }
    }
}
```