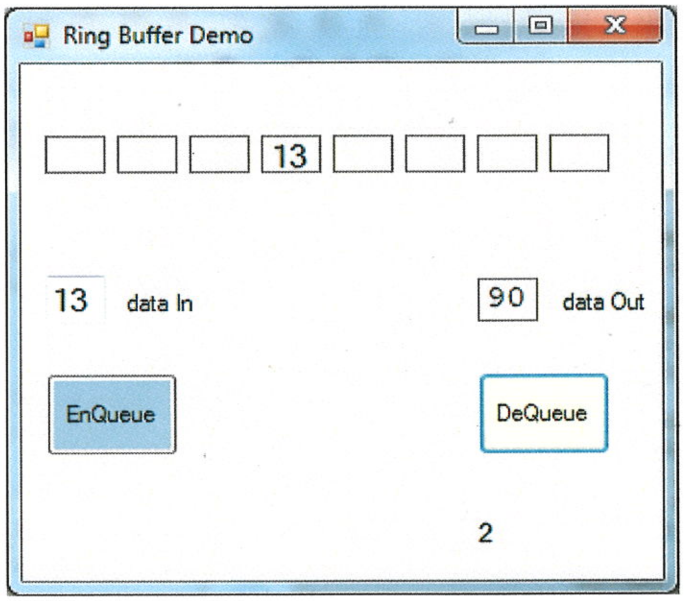
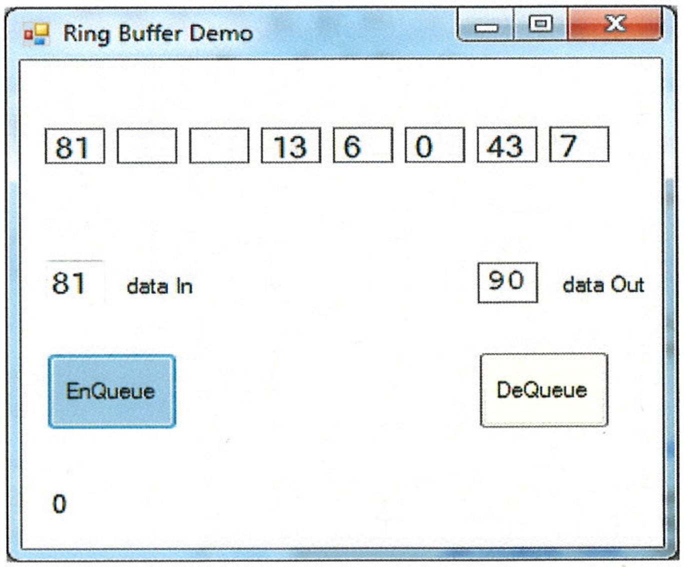
Ring buffer

```
#include <stdio.h>
#include <windows.h>
#include <stdarg.h>
#include <conio.h>
#include <time.h>

typedef   unsigned int Cmd_t;
#define BUFSIZE           8
#define EMPTY -1
static  int nRdCnts          = 0;      // make sure the EnQ don't write to it
static  int nWrCnts          = 0;      // make sure the DeQ don't write to it
static     int nRear                   = 0;
static     int nFront                  = 0;
static     Cmd_t cElement                       = 0;
static     Cmd_t RingBuf[BUFSIZE];

int iEnQ(Cmd_t nCommand);
int iDeQ(Cmd_t* nCommand);


int main(void)
{
        int i = 0;
        Cmd_t n = 0;
        Cmd_t poke = 0;

        printf(" --------- Simple Circular buffer practice ---------\n\n");

        n = 600;
        printf(" Add %4d ->", n); iEnQ(n); // to location #0
        n = 34;
        printf(" Add %4d ->", n); iEnQ(n); // to location #1
        n = 5678;
        printf(" Add %4d ->", n); iEnQ(n); // to location #2
        n = 0;
        printf(" Add %4d ->", n); iEnQ(n); // to location #3
        printf("\n");

        n = 891;
        printf(" Add %4d ->", n); iEnQ(n); // to location #4
        n = 7;
        printf(" Add %4d ->", n); iEnQ(n); // to location #5
        n = 12;
        printf(" Add %4d ->", n); iEnQ(n); // to location #6
        n = 446;
        printf(" Add %4d ->", n); iEnQ(n); // to location #7
        printf("\n");

        n = 77;
        printf(" Add %4d ->", n); iEnQ(n); // to location #0
        printf("\n");
        n = 321;
        printf(" Add %4d ->", n); iEnQ(n); // to location #1
        printf("\n");
        iDeQ(&poke);
        printf(" Get %4d, ", (int)poke);             // fr location #2
        printf("\n");
        n = 4;
        printf(" Add %4d ->", n); iEnQ(n); // to location #2
        printf("\n");
        do {
                if (iDeQ(&poke) == EMPTY)
                        break;
                printf(" Get %4d, ", (int)poke);
        } while(i++ <= BUFSIZE);
        printf("\n");

        printf("\n\nThis program %s \n\t is compiled (%s)\n\t using C compiler version %lu\n\n",
                        __FILE__, __TIMESTAMP__, _MSC_FULL_VER);
        printf("press a key to end this program...");
        getch();
        return 0;
}

int iEnQ(Cmd_t nCommand)
{
        // make sure don't write to nRdCnts
        // the unsigned of diff reveals the Q's % fullness [0...100]
        int diff = nWrCnts-nRdCnts;
        if (diff < 0)
                diff = !diff;

        if ((nFront == nRear) && (7 <= diff))
        {       // true when Q is full
                nRear = nFront;
                nFront++;       // make the next one the oldest
        }
        printf("[%d] ", nRear);
        RingBuf[nRear] = nCommand;
        nWrCnts++;
        nRear++;
        if (nRear >= 8)
                nRear = 0;
        if (nWrCnts > BUFSIZE) {
                nWrCnts = 8;
        }
        return 1;
}

int iDeQ(Cmd_t* nCommand)
{
        // make sure don't write to nWrCnts
        if ((nRear == nFront) && (nWrCnts == nRdCnts))   // it's empty
                return EMPTY;
        printf("[%d] ", nFront);
        *nCommand = RingBuf[nFront];
        nFront++;
        nRdCnts++;
        if (nRdCnts > BUFSIZE)
                nRdCnts = 8;
        if (nFront >= BUFSIZE)
                nFront = 0;     // wrap around to the first

        return 1;
}
```

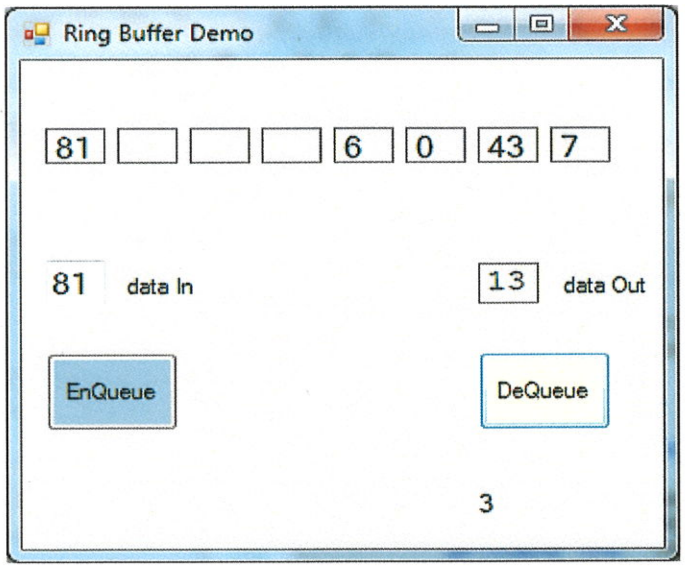
```
using System;
using System.Collections.Generic;
using System.ComponentModel;
using System.Data;
using System.Drawing;
using System.Linq;
using System.Text;
using System.Windows.Forms;
using System.Collections;

namespace RingbufDemo
{
    public partial class RingBufDemoForm : Form
    {
        private int nWrCnts = 0;
        private int nRdCnts = 0;
        private int  nRear = 0;
        private int  nFront = 0;
        private int  Currentslot = 0;
        private int  BUFSIZE = 8;
        private int  nItems = 0;
        private int EMPTY = -1;

        private string[] RingBuf = new string[8];

        public RingBufDemoForm()
        {
            InitializeComponent();

        }

        private void btn_EnQ_Click(object sender, EventArgs e)
        {
            switch (iEnQ(txt_data.Text))
            {
                case 0:
                    label1.Text = txt_data.Text;
                    break;
                case 1:
                    label2.Text = txt_data.Text;
                    break;
                case 2:
                    label3.Text = txt_data.Text;
                    break;
                case 3:
                    label4.Text = txt_data.Text;
                    break;
                case 4:
                    label5.Text = txt_data.Text;
                    break;
                case 5:
                    label6.Text = txt_data.Text;
                    break;
                case 6:
                    label7.Text = txt_data.Text;
                    break;
                case 7:
                    label8.Text = txt_data.Text;
                    break;
                default:
                    break;
            }
        }

        private void btn_DeQ_Click(object sender, EventArgs e)
        {
            int slot = 0;
            string command = "()";
            slot = iDeQ(ref command);
            lbl_DataOut.Text = command;
            switch (slot)
            {
                case 0:
                    label1.Text = "";
                    break;
                case 1:
                    label2.Text = "";
                    break;
                case 2:
                    label3.Text = "";
                    break;
                case 3:
                    label4.Text = "";
                    break;
                case 4:
                    label5.Text = "";
                    break;
                case 5:
                    label6.Text = "";
                    break;
                case 6:
                    label7.Text = "";
                    break;
                case 7:
                    label8.Text = "";
                    break;
                default:
                    break;
            }
        }

        private int iEnQ(string command)
        {
            RingBuf[nRear] = command;
            nItems += 1;

            Currentslot = nRear;
            nWrCnts += 1;
            nRear += 1;

            if (nWrCnts >= BUFSIZE)
                nWrCnts = 8;
            if (nRear >= 8)
                nRear = 0;
            if (nItems > 8)
            {
                nItems = 8;
                nFront += 1;     //# make the previous one the oldest
            }
            if (nFront >= 8)
                nFront = 0;
            if ((nFront == nRear))
                lbl_eslot.Text = " Last item to fill" + Currentslot.ToString();

            lbl_eslot.Text = Currentslot.ToString();
            if (nItems == 8)
                lbl_eslot.Text = Currentslot.ToString() + "(full)";
            lbl_dslot.Text = "";
            return Currentslot;
        }

        private int iDeQ(ref string command)
        {
            if ((nRear == nFront) && (nWrCnts == nRdCnts))
            {
                nRear = 0;
                nFront = 0;
                nWrCnts = 0;
                nRdCnts = 0;
                lbl_dslot.Text = "(Empty)";
                lbl_eslot.Text = "";
                return EMPTY;
            }
            command = RingBuf[nFront];
            nItems -= 1;
            Currentslot = nFront;
            nFront += 1;
            nRdCnts += 1;
            if (nRdCnts > BUFSIZE)
                nRdCnts = 8;
            if (nFront >= BUFSIZE)
                nFront = 0; //  # wrap around to the first

            lbl_dslot.Text = Currentslot.ToString();
            lbl_eslot.Text = "";
            return Currentslot;
        }
    }
}
```



```
[ ] [ ] [ ] [13] [ ] [ ] [ ] [ ]

13  data In                90  data Out

2
```



```
[81] [ ] [ ] [13] [6] [0] [43] [7]

81  data In                90  data Out

0
```



```
[81] [ ] [ ] [ ] [6] [0] [43] [7]

81  data In                13  data Out

3
```