Day13 Assignment

By

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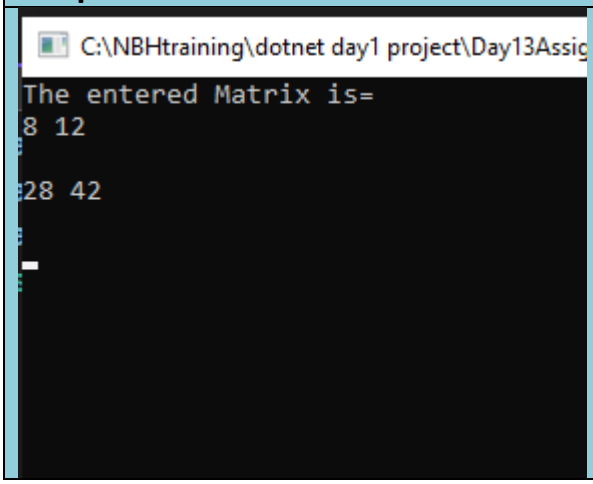
Question1:
Declare a 2dimension array of size(2,2) and initialize using the indexes and print the values using nested for loop?

Code:

```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;
using System.Threading.Tasks;

namespace _2dimensional_Array
{
    internal class Program
    {
        static void Main(string[] args)
        {
            //Author:Narala Praveen
            //Purpose:Declare an 2d array of size(2,2)
            int[,] data = new int[2, 2];
            data[0, 0] = 8;
            data[0, 1] = 12;
            data[1, 0] = 28;
            data[1, 1] = 42;
            Console.WriteLine("The entered Matrix is=");
            for (int i=0;i<2;i++)
            {
                for(int j=0;j<2;j++)
                {
                    Console.Write(data[i,j]+" ");
                }
                Console.WriteLine("\n");
            }
            Console.ReadLine();
        }
    }
}
```

Output:

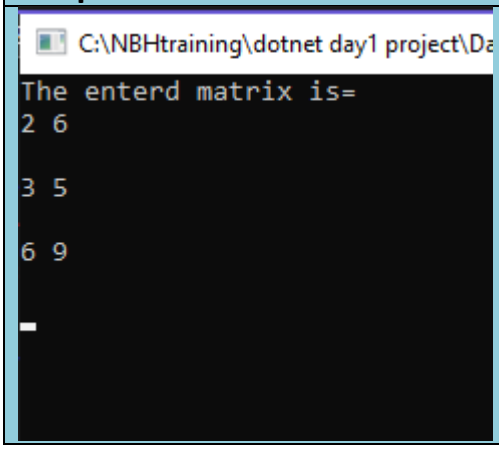


Question2:
Declare a 2D array of size(3,2) and initialize in the same line while declaring and print the values using nested for loop?

Code:

```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;
using System.Threading.Tasks;

namespace _2DArray_3_2_
{ //Author :Narala Praveen
  //Purpose:To declare 2D array of size(3,2) and initialise
    internal class Program
    {
        static void Main(string[] args)
        {
            //initializing of Array
            int[,] data = new int[,] { { 2, 6 },{ 3, 5 }, { 6, 9 } };
            Console.WriteLine("The enterd matrix is=");
            for(int i=0;i<3;i++)
            {
                for(int j=0;j<2;j++)
                {
                    Console.Write(data[i,j]+" ");
                }
                Console.WriteLine("\n");
            }
            Console.ReadLine();
        }
    }
}
```

Output:

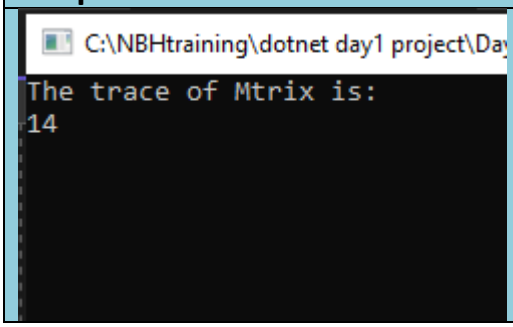


Question3:
Declare a 2-d array of size (3,3) and print trace of the Array?

Code:

```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;
using System.Threading.Tasks;

namespace _2D_Array__3_3_Trace
{   //Author:Narala Praveen
    //Purpose:To find the trace of 2D array
    internal class Program
    {
        static void Main(string[] args)
        {
            //initialization of Array
            int sum = 0;
            int[,] data = new int[,] { { 5, 34, 28 }, { 52, 6, 28 }, { 72, 42, 3
} };
            Console.WriteLine("The trace of Mtrix is:");

            for(int i=0;i<3;i++)
            {
                for(int j=0;j<3;j++)
                {
                    if (i == j)//condition
                        sum = sum + data[i, j];
                }
            }
            Console.WriteLine(sum);
            Console.ReadLine();
        }
    }
}
```

Output:

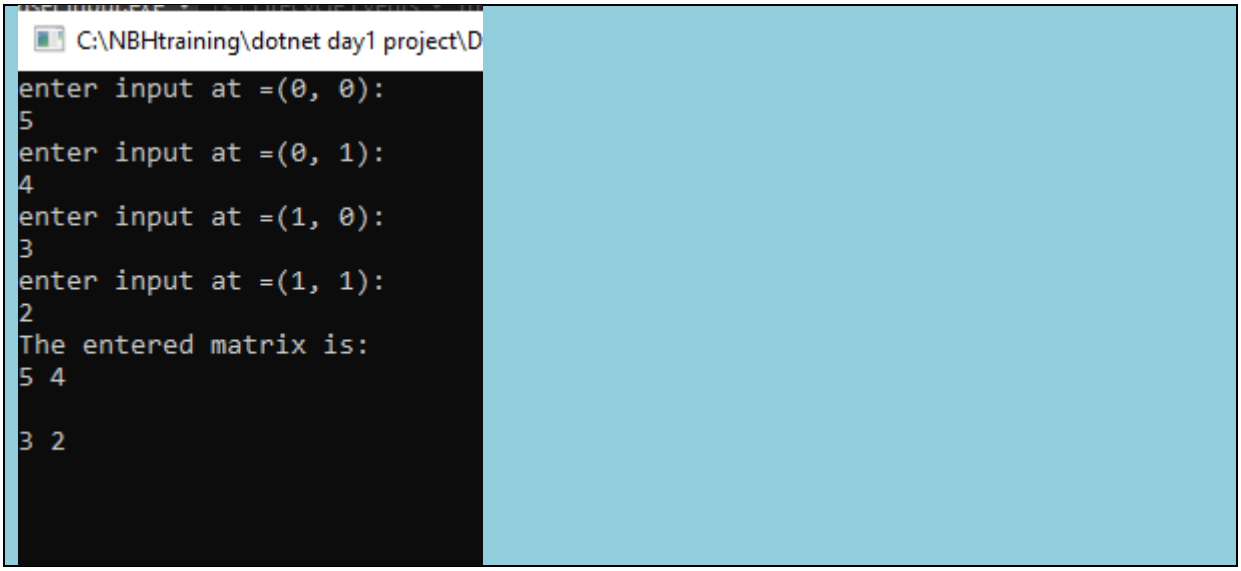


Question4:
Declare a 2-D Array of size(2,2) and read values from user and print the values?

Code:

```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;
using System.Threading.Tasks;

namespace _2d_Array__2_2_user_input
{  //Author :Narala Praveen
    //Purpose:To declare a 2D array bu user input
    internal class Program
    {
        static void Main(string[] args)
        {
            int[,] data = new int[2, 2];

            //user input

            for(int i=0;i<2;i++)
            {
                for(int j=0;j<2;j++)
                {
                    Console.WriteLine("enter input at ={0}:", (i,j));
                    data[i,j] = Convert.ToInt32(Console.ReadLine());
                }

            }
            //output
            Console.WriteLine("The entered matrix is:");
            for(int i=0;i<2;i++)
            {
                for(int j=0;j<2;j++)
                {
                    Console.Write(data[i,j]+" ");
                }
                Console.WriteLine("\n");
            }
            Console.ReadLine();
        }
    }
}
```

Output:


C:\NBHtraining\dotnet day1 project\D
enter input at =(0, 0):
5
enter input at =(0, 1):
4
enter input at =(1, 0):
3
enter input at =(1, 1):
2
The entered matrix is:
5 4
3 2

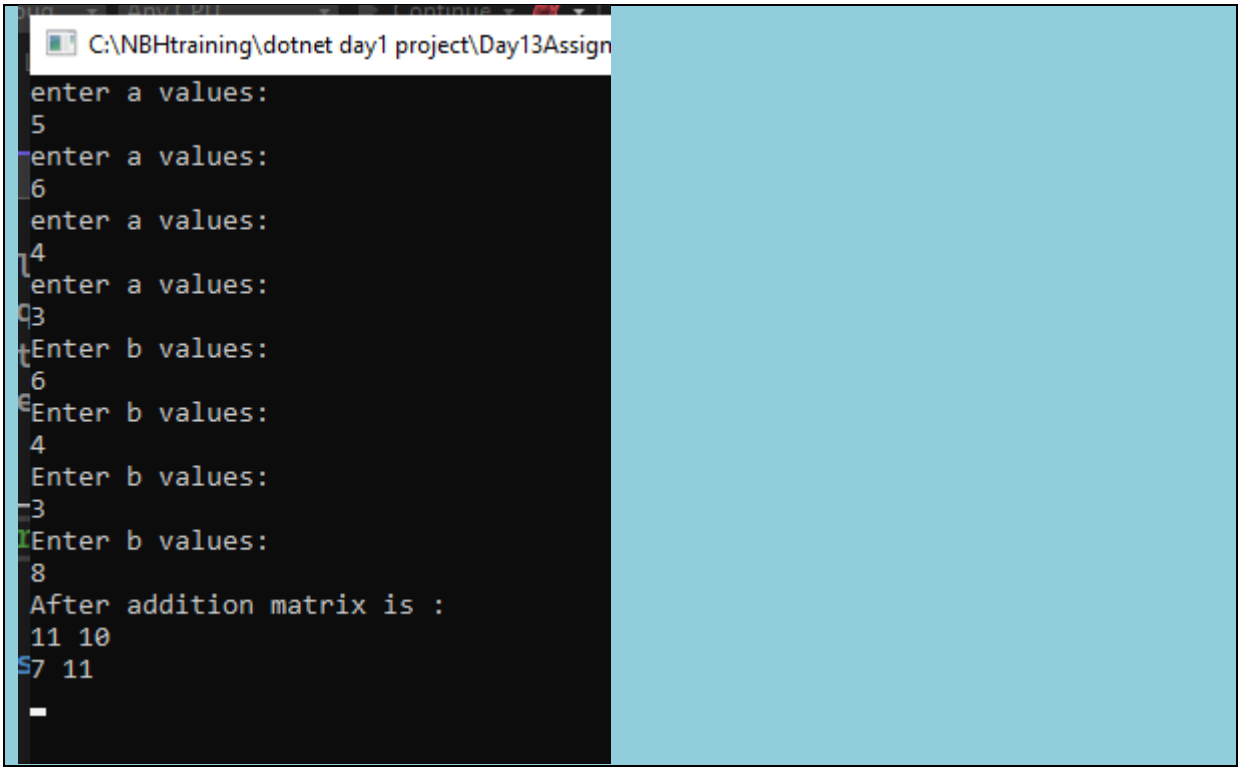
Question5:

Declare two 2-D arrays of size (2,2) and read values from user and print the sum of two matrices?

Code:

```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;
using System.Threading.Tasks;

namespace sum_of_2_D_arrays
{    //Author:Narala Praveen
    //Purpose:To perform sum of two arrays of size(2,2)
    internal class Program
    {
        static void Main(string[] args)
        {
            int[,] a = new int[2, 2];
            int[,] b = new int[2, 2];
            int[,] sum = new int[2, 2];
            //matrices one
            for(int i=0;i<2;i++)
            {
                for (int j = 0; j < 2; j++)
                {
                    Console.WriteLine("enter a values:");
                    a[i, j] = Convert.ToInt32(Console.ReadLine());

                }
            }
            //matrices two
            for (int i = 0; i < 2; i++)
            {
                for (int j = 0; j < 2; j++)
                {
                    Console.WriteLine("Enter b values:");
                    b[i, j] = Convert.ToInt32(Console.ReadLine());

                }
            }
            //Addition
            Console.WriteLine("After addition matrix is :");
            for (int i = 0; i < 2; i++)
            {
                for (int j = 0; j < 2; j++)
                {
                    sum[i, j] = a[i, j] + b[i, j];
                    Console.Write(sum[i, j]+" ");

                }

                Console.WriteLine();
            }
            Console.ReadLine();
        }
    }
}
```

Output:


C:\NBHtraining\dotnet day1 project\Day13Assign
enter a values:
5
enter a values:
6
enter a values:
4
enter a values:
3
Enter b values:
6
Enter b values:
4
Enter b values:
3
Enter b values:
8
After addition matrix is :
11 10
7 11

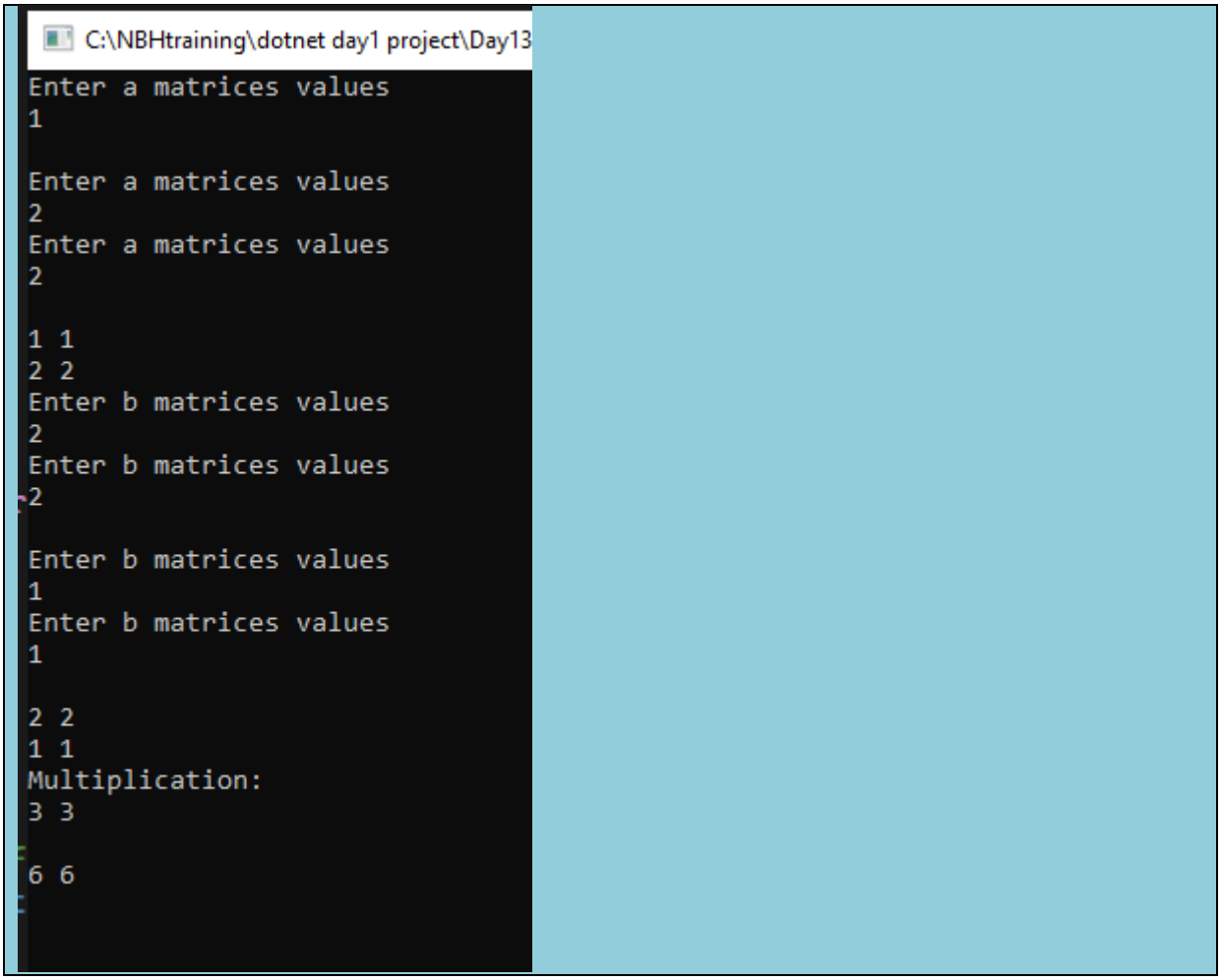
Question6:
Declare two 2-d arrays of size(2,2) and read values from user and print the product of two matrices?

Code:

```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;
using System.Threading.Tasks;

namespace day13project6
{
    //Author:Narala Praveen
    //Purpose:Product of Two matrices
    internal class Program
    {
        static void Main(string[] args)
        {
            //variable declaration
            int m;
            int n;
            int p;
            int q;
            Console.WriteLine("Enter rows value of a:");
            m = Convert.ToInt32(Console.ReadLine());
            Console.WriteLine("Enter columns value of a:");
            n = Convert.ToInt32(Console.ReadLine());
            Console.WriteLine("Enter rows value of b");
            p = Convert.ToInt32(Console.ReadLine());
            Console.WriteLine("Enter columns value of b");
            q = Convert.ToInt32(Console.ReadLine());
            int[,] a = new int[m,n];

            //for loop for A matrices
            for(int i=0;i<m;i++)
            {
                for(int j=0;j<n;j++)
                {
                    Console.WriteLine("Enter a matrices values ");

                    a[i, j] = Convert.ToInt32(Console.ReadLine());

                }
                Console.WriteLine();
            }

            for(int i=0;i<m;i++)
            {
                for(int j=0;j<n;j++)
                {
                    Console.Write(a[i,j]+" ");
                }
                Console.WriteLine();
            }
            //for loop for b Matrices
            int[,] b = new int[p, q];

            for (int i = 0; i < p; i++)
            {
                for (int j = 0; j < q; j++)
```

```
                {
                    Console.WriteLine("Enter b matrices values ");

                    b[i, j] = Convert.ToInt32(Console.ReadLine());
                }
                Console.WriteLine();
            }


            for (int i = 0; i < p; i++)
            {
                for (int j = 0; j < q; j++)
                {
                    Console.Write(b[i, j] + " ");
                }
                Console.WriteLine();
            }

                if(n==p)
            {  //product matrices
                int[,] c = new int[m, q];
                Console.WriteLine("Multiplication:");
                for(int i=0;i<m;i++)
                {
                    for(int j=0;j<q;j++)
                    {
                        c[i, j] = 0;
                        for(int k=0;k<n;k++)
                        {
                            c[i, j] += a[i, k] * b[k,j];
                        }
                        Console.Write(c[i,j]+" ");
                    }
                    Console.WriteLine("\n");
                }
            }

            Console.ReadLine();
        }
    }
}
```

Output:


C:\NBHtraining\dotnet day1 project\Day13
Enter a matrices values
1
Enter a matrices values
2
Enter a matrices values
2
1 1
2 2
Enter b matrices values
2
Enter b matrices values
2
Enter b matrices values
1
Enter b matrices values
1
2 2
1 1
Multiplication:
3 3
6 6

Question7:
What is a Jagged Array
What is the benefit of jagged Array?

Jagged in C# is a array which doesn't have a definite size.

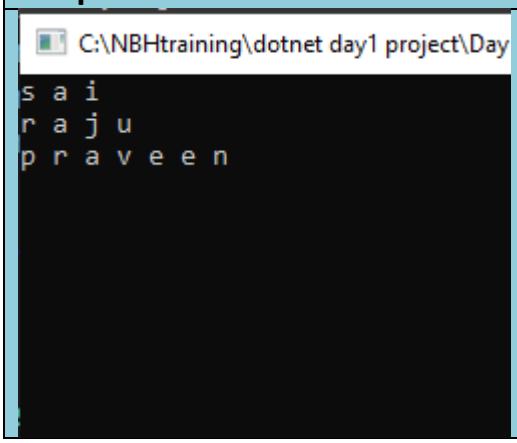
a. **It is helpful in effective usage of memory.**
b. **It will helpful to store data in multidimensional way using the same variable name.**
c. **It is used to store rows of data of varying lengths to improve Performance.**

Question8:
Write a C# program to declare a jagged array and print values?

Code:

```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;
using System.Threading.Tasks;

namespace jagged_Array
{  //Author:narala Praveen
    //Purpose:Jagged Array
    internal class Program
    {
        static void Main(string[] args)
        {
            char[][] names = new char[3][];
            names[0] = new char[] { 's', 'a', 'i' };
            names[1] = new char[] { 'r', 'a', 'j', 'u' };
            names[2] = new char[] { 'p', 'r', 'a', 'v', 'e', 'e', 'n' };

            for(int i=0;i<3;i++)
            {
                for(int j=0;j<names[i].Length;j++)
                {
                    Console.Write(names[i][j] +" ");
                }
                Console.WriteLine();
            }
            Console.ReadLine();
        }
    }
}
```

Output:



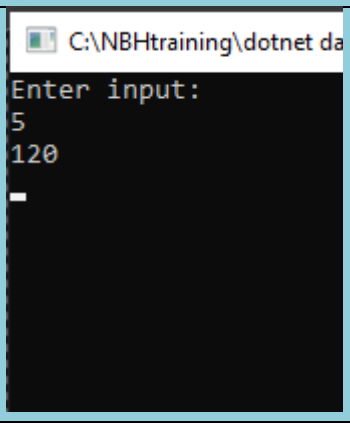
Question9:
What is Recursion?
WACP to illustrate usage of Recursion.
What are the benefits of recursion?

Recursion: A function calling itself repeatedly until a specific condition is completed is called Recursion.

Code:

```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;
using System.Threading.Tasks;

namespace Recursion
{  //Author:Narala Praveen.
    //Purpose:Recursion example
    internal class Program
    {
        static int Factorial(int n)
        {
            if (n == 0)
            {
                return 1;
            }


            else
            {

                int fact = n * Factorial(n - 1);
                return fact;

            }
        }
        static void Main(string[] args)
        {
            Console.WriteLine("Enter input:");
            int n = Convert.ToInt32(Console.ReadLine());
            Console.WriteLine(Factorial(n));
            Console.ReadLine();
        }
    }
}
```

Output:



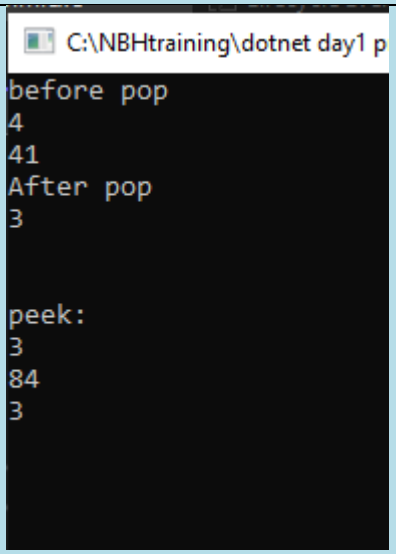
Question10:
WACP to illustrate usage Stack<> Write couple of points about stack?

Stack works on "Last in First out Algorithm".

Code:

```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;
using System.Threading.Tasks;

namespace StackProgramm
{    //Author:Narala Praveen
    //Purpose:Stack programm
    internal class Program
    {
        static void Main(string[] args)
        {
            Stack<int> data = new Stack<int>();
            data.Push(20);
            data.Push(42);
            data.Push(84);
            data.Push(41);
            Console.WriteLine("before pop");
            Console.WriteLine(data.Count);
            Console.WriteLine(data.Pop());
            Console.WriteLine("After pop");
            Console.WriteLine(data.Count);

            Console.WriteLine("\n");
            Console.WriteLine(data.Count);
            Console.WriteLine(data.Peek());
            Console.WriteLine(data.Count);

            Console.ReadLine();

        }
    }
}
```

Output:



Question11:
WACP to illustrate usage of Queue<>
Write couple of points about queue?

Queue works on "First in First out Algorithm"

Code:

```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;
using System.Threading.Tasks;

namespace Queue
{    //Author:Narala Praveen
    //Purpose:Queue Example.
    internal class Program
    {
        static void Main(string[] args)
        {
            Queue<int> data = new Queue<int>();
            data.Enqueue(20);
            data.Enqueue(42);
            data.Enqueue(84);
            data.Enqueue(41);
            Console.WriteLine("before Dequeue");
            Console.WriteLine(data.Count);
            Console.WriteLine(data.Dequeue());
            Console.WriteLine("After Dequeue");
            Console.WriteLine(data.Count);

            Console.WriteLine("\n");
            Console.WriteLine("peek:");
            Console.WriteLine(data.Count);
            Console.WriteLine(data.Peek());
            Console.WriteLine(data.Count);

            Console.ReadLine();
        }
    }
}
```

Output: