```
using System;

namespace GradeBookApp
{
    class Program
    {
        static void Main(string[] args)
        {
            double[] studentGrades = new double[20];
            string course;
            int numOfStudents;
            char _continue = 'y';

            while(Char.ToLower(_continue) == 'y')
            {
                Console.Write("Please enter the name of the course: ");
                course = Console.ReadLine();
                Console.Write("Please enter the number of students " +
                    "in the course: ");
                numOfStudents = Convert.ToInt32(Console.ReadLine());
                GradeBook gradeBook = new GradeBook(course, studentGrades,
                    numOfStudents);

                Console.WriteLine("Enter a grade for each student followed by" +
                    "the return key, up to twenty grades");

                for(int i = 0; i < numOfStudents; i++)
                {
                    Console.Write("-->: ");
                    studentGrades[i] = Convert.ToDouble(Console.ReadLine());
                }

                gradeBook.DisplayMessage();
                gradeBook.ProcessGrades();

                Console.WriteLine("Whould you like to enter grades for " +
                    "another course? Enter y for yes or n for no: ");
                _continue = Console.ReadKey().KeyChar;
                Console.WriteLine();
            }

            Console.ReadKey();

        }
    }
}
```

```
using System;

namespace GradeBookApp
{
    public class GradeBook
    {
        private double[] grades; // array of student grades
        private readonly int numOfGrades;

        // auto implimented property
        public string CourseName { get; set; }

        public GradeBook(string name, double[] gradesArray, int numGrades)
        {
            CourseName = name;
            grades = gradesArray;
            numOfGrades = numGrades;
        }

        public void DisplayMessage()
        {
            Console.WriteLine("Welcome to the Grade Book for\n{0}!\n",
                CourseName);
        }

        // perform operations on the data
        public void ProcessGrades()
        {
            // output grades array
            ShowGrades();

            // calculate and print the class average grade
            Console.WriteLine("\nClass average is {0:f}", GetAverage());

            // calculate and print the highest and lowest grades
            Console.WriteLine("Lowest grade is {0:f}\nHighest grade is {1:f}\n",
                GetMinimum(), GetMaximum());

            // display graade distribution bar chart
            ShowBarChart();
        }

        // find minimum grade
        public double GetMinimum()
        {
            double lowGrade = grades[0];

            for(int i = 0; i < numOfGrades; i++)
            {
                // if next grade in array is lower, store that grade in lowGrade
                if(grades[i] < lowGrade)
                {
                    lowGrade = grades[i];
                }
            }
            return lowGrade;
        }

        public double GetMaximum()
        {
            double highGrade = grades[0];

            for(int i = 0; i < numOfGrades; i++)
            {
                // if next grade in array is higher, store that grade in highGrade
                if(grades[i] > highGrade)
                {
                    highGrade = grades[i];
                }
            }
            return highGrade;
        }

        // calculate the average grade
        public double GetAverage()
        {
            double total = 0;

            // total all the grades in array
            for(int i = 0; i < numOfGrades; i++)
            {
                total += grades[i];
            }
            return total / numOfGrades;
        }

        // output bar chart shoing grade distribution
        public void ShowBarChart()
        {
            Console.WriteLine("Grade Distribution: ");

            // store the freqency of grades in each range
            double[] frequency = new double[11];

            for(int i = 0; i < frequency.Length; i++)
            {
                ++frequency[(int)grades[i] / 10];
            }
            // display a bar for each grade freqency
            for(int count = 0; count < frequency.Length; count++)
            {
                // display labels for frequencies "0 - 9, ... 90 - 99, 100"
                if(count == 10)
                {
                    Console.Write("  100: ");
                }
                else
                {
                    Console.Write("{0:D2}-{1:D2}: ", count * 10, (count * 10) +
9);
                }
                // display a bar of asterisk
                for(int stars = 0; stars < frequency[count]; stars++)
                {
                    Console.Write("*");
                }
                Console.WriteLine();
            }
        }

        // display each student's grade
        public void ShowGrades()
        {
            Console.WriteLine("The grades are:\n");

            for(int student = 0; student < numOfGrades; student++)
            {
                Console.WriteLine("Student {0,2}: {1,3}",
                    student + 1, grades[student]);
            }
        }
    } // end GradeBook
}
```