שיעורי בית ביסודות מערכים – אופיר הופמן י3

תרגיל 1

```
public static void Ex1()
        {
            Random random = new Random();
            int[] arr = new int[10];
            for(int i = 0; i < arr.Length; i++)
            {
                arr[i] = random.Next(1,11);
            }

            for (int i = 0; i<10; i++)
            {
                Console.Write(arr[i] + ",");
            }

            int [] arr2 = new int[arr.Length];
            for (int i = arr.Length-1; i >=0 ; i--)
            {
                arr2[arr.Length -1 - i] = arr[i];
            }
            Console.WriteLine();
            for (int i = 0; i <10; i++)
            {
                Console.Write(arr2[i] + ",");
            }
        }
```

תרגיל 2

```
public static void Ex2()
        {
            Random rnd = new Random();
            int[] arr = new int[5];
            for(int i =0; i<arr.Length; i++)
            {
                arr[i] = rnd.Next(1, 11);
            }

            for (int i = 0; i < 5; i++)
            {
                Console.Write(arr[i] + ",");
            }

            int num = 2;
            Console.WriteLine();
            Console.WriteLine(num);
            int count = 0;

            for (int i = 0; i < arr.Length; i++)
            {
```

```
            if (arr[i] > num)
                count++;
        }

        Console.WriteLine(count);
    }
```

תרגיל 3

```
public static void Ex3()
{
    Random rnd = new Random();
    int[] arr = new int[8];
    int last = int.MinValue, count = 0;

    for (int i = 0; i < arr.Length; i++)
    {
        arr[i] = rnd.Next(1, 11);
    }

    for (int i = 0; i < arr.Length; i++)
    {
        Console.Write(arr[i] + ",");
    }

    for (int i = 0; i < arr.Length; i++)
    {
        if (arr[i] < last)
            count++;

        last = arr[i];
    }

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

תרגיל 4

```
public static void Ex4()
{
    Random rnd = new Random();
    int[] arr = new int[7];

    for (int i = 0; i < arr.Length; i++)
    {
        arr[i] = rnd.Next(1, 11);
    }

    for (int i = 0; i < arr.Length; i++)
    {
        Console.Write(arr[i] + ",");
    }

    int even = 0, odd = 0, oddSum = 0;

    for (int i = 0; i < arr.Length; i++)
    {
        if (arr[i] % 2 == 0)
            even++;
        else
        {
            odd++;
            oddSum += arr[i];
        }
    }

    Console.WriteLine("even: " + even);
    Console.WriteLine("odd: " + odd);
    if(odd > 0)
```

```
    {
        double avg = (double)oddSum / odd;
        Console.WriteLine("avg: " + avg);
    }
}
```

תרגיל 5

```
public static void Ex5()
{
    Random rnd = new Random();
    int[] arr = new int[7];

    for (int i = 0; i < arr.Length; i++)
    {
        arr[i] = rnd.Next(1, 11);
    }

    for (int i = 0; i < arr.Length; i++)
    {
        Console.Write(arr[i] + ",");
    }

    bool ole = true;

    for(int i = 1; i < arr.Length && ole; i++)
    {
        ole = arr[i] >= arr[i - 1];
    }

    Console.WriteLine(ole);
}
```

תרגיל 6

```
public static void Ex6()
{
    Random rnd = new Random();
    int[] arr = new int[10];

    int posCount = 0, negCount = 0;

    for (int i = 0; i < arr.Length; i++)
    {
        arr[i] = rnd.Next(-10, 11);
        if (arr[i] > 0)
            posCount++;
        else
            negCount++;
    }

    for (int i = 0; i < arr.Length; i++)
    {
        Console.Write(arr[i] + ",");
    }

    int[] pos = new int[posCount];
    int[] neg = new int[negCount];
    int posi = 0, negi = 0;

    for (int i = 0; i < arr.Length; i++)
    {
        if (arr[i] > 0)
        {
            pos[posi] = arr[i];
            posi++;
        }
        else
        {
            neg[negi] = arr[i];
            negi++;
        }
    }

    Console.WriteLine();

    for (int i = 0; i < pos.Length; i++)
    {
        Console.Write(pos[i] + ",");
    }
    Console.WriteLine();
    for (int i = 0; i < neg.Length; i++)
    {
        Console.Write(neg[i] + ",");
    }
}
```

תרגיל 7

```
public static void Ex7(int[] arr)
{
    bool cont = true;
    int last = arr[0];

    for (int i = 1; i < arr.Length && cont; i++)
    {
        if (arr[i] != last)
        {
            cont = false;
        }
        last = arr[i];
    }

    Console.WriteLine(cont);
}
```

המשך למטה

תרגיל 8

```
public static int MaxIndex(int[] arr) //פעולה מחזירה את האינדקס של הערך הגדול ביותר
{
    int max = arr[0] - 1;
    int maxi = -1;
    for (int i = 0; i < arr.Length; i++)
    {
        if (arr[i] > max)
        {
            max = arr[i];
            maxi = i;
        }
    }
    return maxi;
}

//פעולה שמחזירה את מס הפעמים שמופיע ערך של אינדקס מסויים ממערך מסויים באותו המערך
public static int Counter(int[] arr, int index)
{
    int count = 0;
    for (int i = 0; i < arr.Length; i++)
    {
        if (arr[i] == arr[index])
        {
            count++;
        }
    }
    return count;
}

public static void Ex8()
{
    Random rnd = new Random();
    int[] arr = new int[10];
    for (int i = 0; i < arr.Length; i++)
    {
        arr[i] = rnd.Next(4,28);
    }

    Console.WriteLine();
    for (int i = 0; i < arr.Length; i++)
    {
        Console.Write(arr[i] + ",");
    }

    int[] cnt = new int[10];
    for (int i = 0; i < arr.Length; i++)
    {
        cnt[i] = Counter(arr, i);
    }

    Console.WriteLine(arr[MaxIndex(cnt)]);
}
```

תרגיל 9

```
//פעולה בודקת האם ערך באינדקס מסויים במערך אחד נמצא במערך אחר
public static bool Match(int[] A, int Index, int[] B)
{
    bool foundMatch = false;
    for (int i = 0; i < B.Length; i++)
    {
        if (B[i] == A[Index])
        {
            foundMatch = true;
        }
    }
    return foundMatch;
}

public static void Ex9()
{
    int[] A = new int[5];
    for(int i = 0; i<A.Length; i++)
    {
        A[i] = int.Parse(Console.ReadLine());
    }

    for (int i = 0; i < A.Length; i++)
    {
        Console.Write(A[i] + ",");
    }

    Console.WriteLine();

    int[] B = new int[5];
    for (int i = 0; i<B.Length; i++)
    {
        B[i] = int.Parse(Console.ReadLine());
    }

    for (int i = 0; i < B.Length; i++)
    {
        Console.Write(B[i] + ",");
    }

    int matchCount = 0;
    for(int i = 0; i < A.Length; i++) //כמה פעמים יש חיתוך
    {
        if (Match(A, i, B) == true)
            matchCount++;
    }

    int[] C = new int[matchCount];
    int cIndex = 0;

    for (int i = 0; i < A.Length; i++)//השמת הערכים התואמים במערך החדש
    {
        if (Match(A, i, B) == true)
        {
            C[cIndex] = A[i];
            cIndex++;
        }
    }

    Console.WriteLine();

    for (int i = 0; i < C.Length; i++)
    {
        Console.Write(C[i] + ",");
    }
}
```

תרגיל 10

```
public static void Ex10()
{
    int[] arr = new int[10];
    int sum = 0;
    for (int i = 0; i<arr.Length; i++)
    {
        arr[i] = int.Parse(Console.ReadLine());
        sum += arr[i];
    }

    double avg = (double)sum / arr.Length;
    double deviationSum = 0;

    for (int i=0; i<arr.Length; i++)
    {
        double deviation = Math.Pow((arr[i] - avg), 2);
        deviationSum += deviation;
        Console.WriteLine(arr[i]+": " + deviation);
    }

    double standartDeviation  =
(double)Math.Sqrt((double)deviationSum/arr.Length);
    Console.WriteLine(standartDeviation);
}
```