**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);

}