O‘ZBEKISTON RESPUBLIKASI RAQAMLI TEXNOLOGIYALAR VAZIRLIGI MUHAMMAD AL-XORAZMIY NOMIDAGI TOSHKENT AXBOROT TEXNOLOGIYALARI UNIVERSITETI

Kompyuter injiniringi fakulteti

Sun’iy intellekt kafedrasi

Signallar va tizimlar fanidan

1-TOPSHIRIQ

Mavzu: 1-3 amaliy mashg‘ulotlar yuzasidan svyortka va korrelyatsiya jarayonlarini o‘rganish

Bajardi: 451-21 guruh talabasi

Bahodirov Samandar

Tekshirdi: Umidjon Xasanov

Baho:_____

TOSHKENT 2023

Suyoatke:

1) x = 2 4 3 5 6 1 0

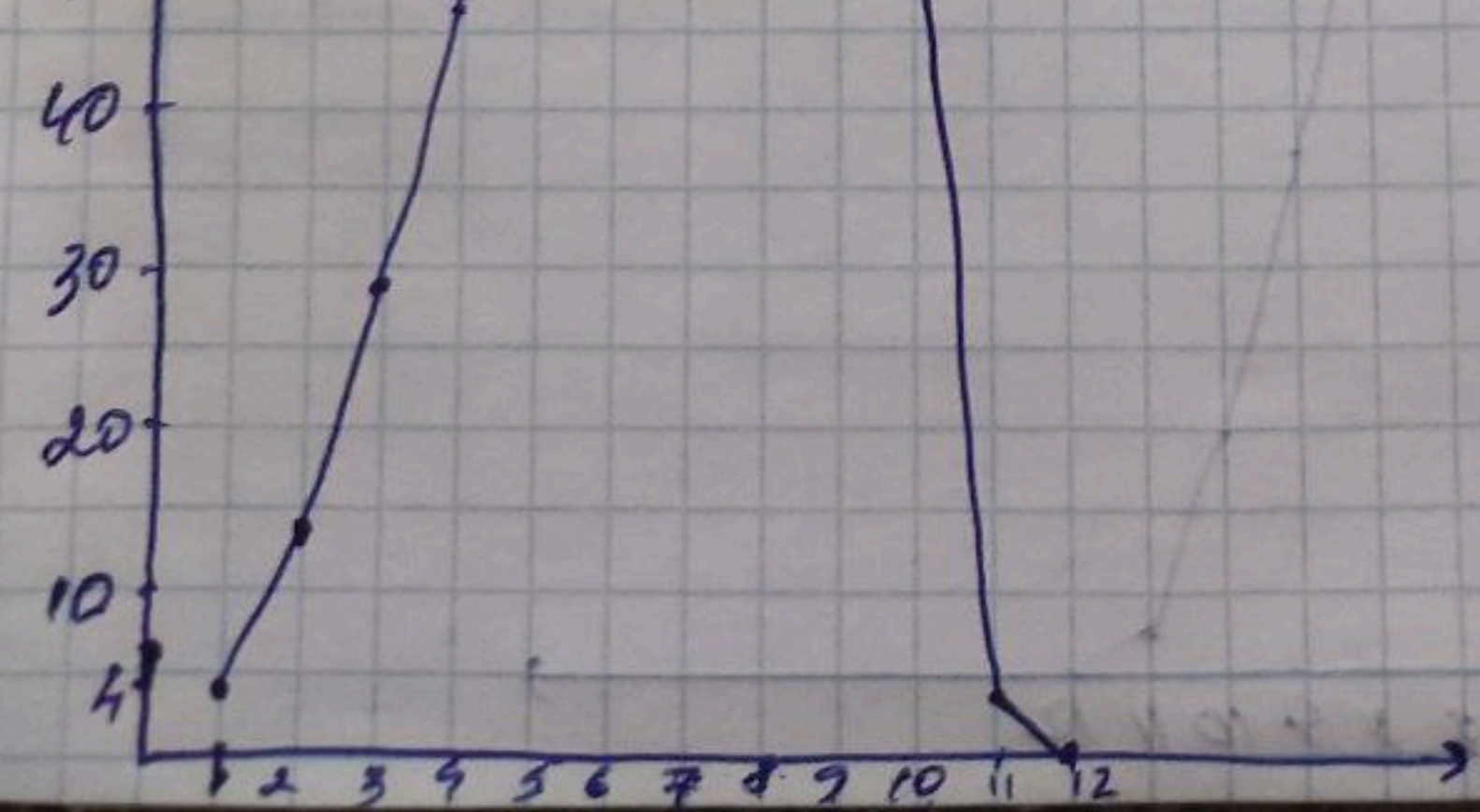
y = 2 3 5 4 1 9.

Topti

2 4 3 5 6 1 0

9 1 4 5 3 2 — 4
9 1 4 5 3 2 — 14
9 1 4 5 3 2 — 28
9 1 4 5 3 2 — 47
9 1 4 5 3 2 — 60
9 1 4 5 3 2 — 79
9 1 4 5 3 2 — 92
9 1 4 5 3 2 — 57
9 1 4 5 3 2 — 55
9 1 4 5 3 2 — 55
9 1 4 5 3 2 — 9
9 1 4 5 3 2 — 0

12 ta.



Teskari: x = 2 4 3 5 6 1 0 .

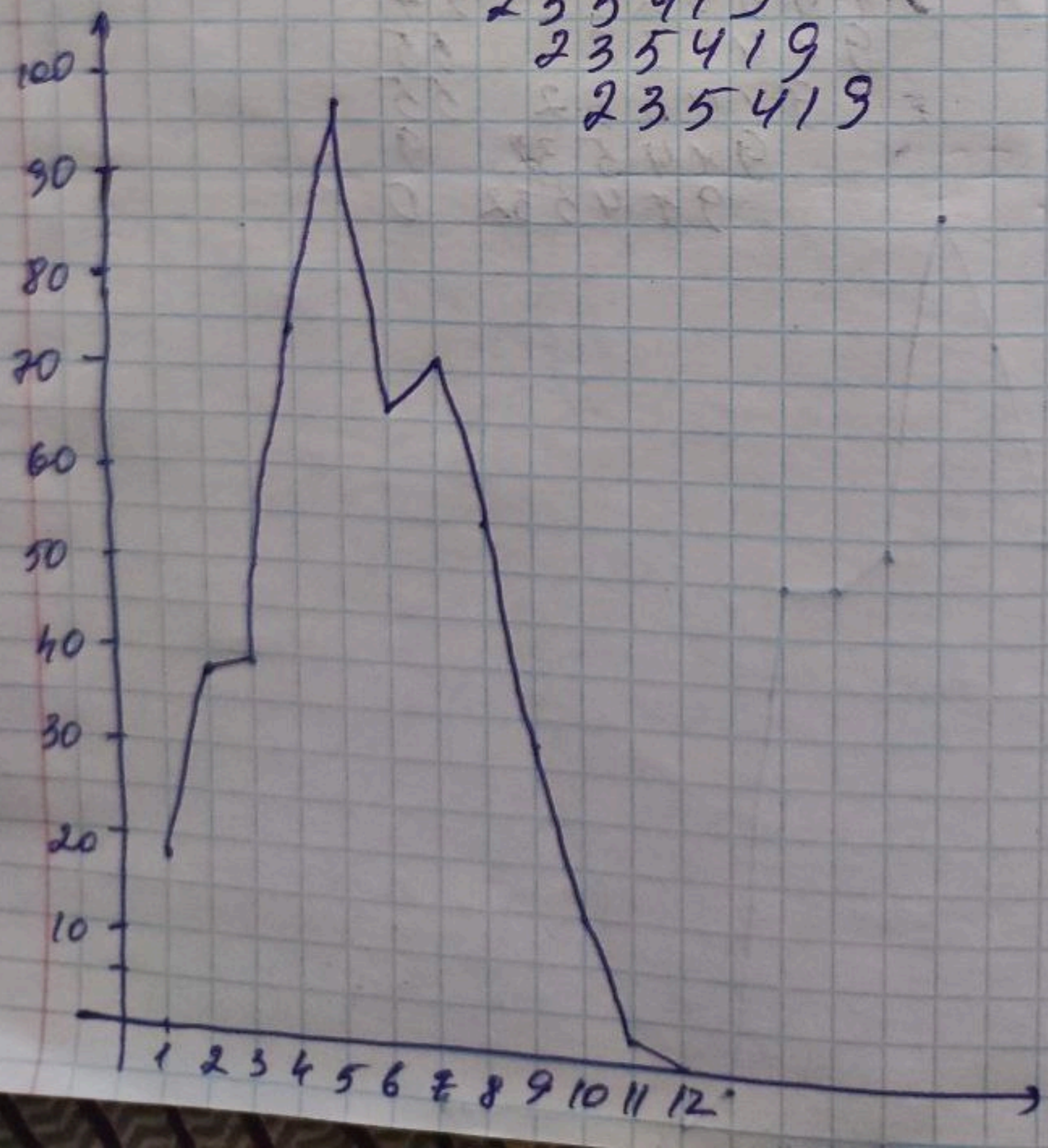
y = 2 3 5 4 1 9

2 4 3 5 6 1 0

2 3 5 4 1 9
2 3 5 4 1 9
2 3 5 4 1 9
2 3 5 4 1 9
2 3 5 4 1 9
2 3 5 4 1 9
2 3 5 4 1 9
2 3 5 4 1 9
2 3 5 4 1 9
2 3 5 4 1 9
2 3 5 4 1 9
2 3 5 4 1 9
2 3 5 4 1 9

18
38
39
74
97
66
71
55
33
15
2
0

12 ta



	1	2	3	0	4
x =	2	3	0	4	1
	3	0	4	1	2
	0	4	1	2	3
	4	1	2	3	0

1 0
y = 0 1

1	2	3	0	4	0
2	4	2	7	1	4
2	2	7	1	6	1
0	7	1	2	4	2
4	8	6	4	3	3
4	1	2	3	0	0

1 0
0 1/1 2 3 0 4
2 3 0 4 1

1 0
0/1 1/2 3 0 4
2 3 0 4 1

1 0
1 0/2 1/3 0 4
2 3 0 4 1

1 0
1 2 0/3 1/0 4

1 0
1 2 3 0/0 1/4

1 0
1 2 3 0 0/4 1

1 0/1 2 3 0 4
0 1/2 3 0 4 1

1/1 0/2 3 0 4
0/2 1/3 0 4 1

1 1/2 0/3 0 4
2 0/3 1/0 4 1

1 2 1/3 0/0 4
2 3 0/0 1/4 1

1 2 3 1/0 0/4
2 3 0 0/4 1/1

1 2 3 0 1/4 0
2 3 0 4 0/1 1

0 1/2 3 0 4 1
1 0/3 0 4 1 2

1/2 0/3 0 4 1
0/3 1/0 4 1 2

2 1/3 0/0 4 1
3 0/0 1/4 1 2

2 3 1/0 0/4 1
3 0 0/4 1/1 2

2 3 0 1/4 0/1
3 0 4 0/1 1/2

2 3 0 4 1/1 0
3 0 4 1 0/2 1

1 0/3 0 4 1 2
0 1/0 4 1 2 3

1/3 0/0 4 1 2
0/0 1/4 1 2 3

3 1/0 0/4 1 2
0 0/4 1/1 2 3

3 0 0/4 1/1 2
0 4 1/1 0/2 3

3 0 4 1/1 0/2
0 4 1 0/2 1/3

3 0 4 1 1/2 0
0 4 1 2 0/3 1

1 0/0 4 1 2 3
0 1/4 1 2 3 0

0/0 1/4 1 2 3
1/4 0/1 2 3 0

0 1/4 0/1 2 3
4 0/1 1/2 3 0

0 4 1/1 0/2 3
4 0/2 1/3 1

0 4 1 1/2 0/3
4 0 2 0/3 1/1

0 4 1 2 1/3 0
4 0 2 3 0/1 1

1 0
0 1/4 1 2 3 0

1 0
0/4 1/1 2 3 0

1 0
4 0/1 1/2 3 0

1 0
4 1 0/2 1/3 0

1 0
4 1 2 0/3 1/0

4 1 2 3 0

№	x	Y	$x_{ō2}-x$	$Y_{ō2}-Y$	$(x_{ō2}-x)^2$	$(Y_{ō2}-Y)^2$
1	5	17	4,75	1,42	21,8	2,01
2	13	23	-3,25	-4,58	11,08	21,006
3	11	20	-1,25	-1,58	1,76	2,5
4	8	19	1,75	-0,58	2,78	0,34
5	6	13	3,75	5,42	13,46	29,34
6	17	7	-7,25	11,42	53,7	130,34
7	15	11	-5,25	7,42	28,4	55,006
8	4	29	5,75	-10,58	32,14	112,006
9	9	31	0,75	-12,58	0,45	157,34
10	7	18	2,75	0,42	7,12	0,173
11	10	12	-0,25	6,42	0,10	41,17
12	12	21	-2,25	-2,58	5,42	6,67

$$x_{ō2t} = \frac{5+13+11+8+6+12+15+4+8+17+9}{12}$$

$$= \frac{117}{12} = 9,75$$

$$y_{ort} = \frac{17+23+20+19+13+7+11+29+31+18+12+21}{12}$$

$$= \frac{221}{12} = 18,42$$

$$\bar{y} = 0,195$$

9-misol

$$y_1 = \frac{\ln x}{\sqrt{x}} \qquad y_2 = x^5 - 0,6x^3 + 1 \quad \{2 : 5\}$$

0,2

$$y_1(2) = \frac{\ln 2}{\sqrt{2}} = 0,49$$

$$y_2(2,2) = \frac{\ln 2,2}{\sqrt{2,2}} = 0,53$$

$$y_2(2,4) = \frac{\ln 2,4}{\sqrt{2,4}} = 0,56$$

+12

$$y_4(2,6) = \frac{\ln 2,6}{\sqrt{2,6}} = 0,59$$

$$y_5(2,8) = \frac{\ln 2,8}{\sqrt{2,8}} = 0,61$$

$$y_6(3) = \frac{\ln 3}{\sqrt{3}} = 0,63$$

$$y_1(3{,}2) = \frac{\ln 3{,}2}{\sqrt{3{,}2}} = 0{,}65$$

$$y_8\ (3{,}4) = \frac{\ln\ 3{,}4}{\sqrt{3{,}4}} = 0{,}66$$

$$y_9 : (3{,}6) = \frac{\ln 3{,}6}{\sqrt{3{,}6}} = 0{,}67$$

$$y_{10}\ (3{,}8) = \frac{\ln 3{,}8}{\sqrt{3{,}6}} = 0{,}70$$

$$y_{11}\ (4) = \frac{\ln 4}{\sqrt{4}} = 0{,}69$$

$$y_{12} \cdot (4{,}2) = \frac{\ln 4{,}2}{\sqrt{4{,}2}} = 0{,}70$$

$$y_{13}\ (4{,}4) = \frac{\ln 4{,}4}{\sqrt{4{,}4}} = 0{,}70$$

$$y_{14}\ (4{,}6) = \frac{\ln\ 4{,}6}{\sqrt{4{,}6}} = 0{,}71$$

$$y_{15}\ (4{,}8) = \frac{\ln 4{,}8}{\sqrt{4{,}8}} = 0{,}71$$

$y_{16}(5) = \frac{\ln 5}{\sqrt{5}} = 0,71$

$x_1(2) = 2^5 - 0,6 \cdot 2^3 + 1 = 28,2$

$x_2(2,2) = 2,2^5 - 0,6 \cdot 2,2^3 + 1 = 46,1$

$x_3(2,4) = 2,4^5 - 0,6 \cdot 2,4^3 + 1 = 72,3$

$x_4(2,6) = 2,6^5 - 0,6 \cdot 2,6^3 + 1 = 109,2$

$x_5(2,8) = 2,8^5 - 0,6 \cdot 2,8^3 + 1 = 159,9$

$x_6(3) = 3^5 - 0,6 \cdot 3^3 + 1 = 222,8$

$x_7(3,2) = 3,2^5 - 0,6 \cdot 3,2^3 + 1 = 316,8$

$x_8(3,4) = 3,4^5 - 0,6 \cdot 3,4^3 + 1 = 431,7$

$x_9(3,6) = 3,6^5 - 0,6 \cdot 3,6^3 + 1 = 577,6$

$x_{10}(3,8) = 3,8^5 - 0,6 \cdot 3,8^3 + 1 = 760,4$

$x_{16}(4) = 4^5 - 0,6 \cdot 4^3 + 1 = 986,6$

$$x_{11}(4,2) = 4,2^5 - 0,6 \cdot 4,2^3 + 1 = 1263,$$

$$x_{12}(4,4) = 4,4^5 - 0,6 \cdot 4,4^3 + 1 = 1599,$$

$$x_{13}(4,6) = 4,6^5 - 0,6 \cdot 4,6^3 + 1 = 2002,$$

$$x_{14}(4,8) = 4,8^5 - 0,6 \cdot 4,8^3 + 1 = 2482$$

$$x_{15}(5) = 5^5 - 0,6 \cdot 5^3 + 1 = 3051$$

N_0	x	y	$x_0 - x$	$y_0 - y$	$(x - x_0)^2$	$(y_0 - y)^2$	
1	0,49	28,2	0,2	853	0,04	727609	882,1
2	0,53	46,1	0,16	836	0,0256	698896	0,69
3	0,56	72,3	0,13	810	0,0169	656100	
4	0,59	109,2	0,1	773	0,01	597529	
5	0,61	159,3	0,08	723	0,0064	522729	
6	0,63	227,8	0,06	655	0,0036	429025	
7	0,65	316,8	0,04	566	0,0016	320356	
8	0,66	431,7	0,03	451	0,0009	203401	
9	0,67	577,6	0,02	305	$0,2 \cdot 10^{-4}$	93025	
10	0,7	760,4	-0,01	122	$0,1 \cdot 10^{-4}$	14884	
11	0,69	986,6	0	-104	0	10816	
12	0,7	1263,4	-0,01	-381	$0,1 \cdot 10^{-4}$	145161	
13	0,7	1599	-0,02	-652	$0,1 \cdot 10^{-4}$	425104	
14	0,71	2002	-0,02	-1120	$0,4 \cdot 10^{-4}$	1254400	
15	0,71	2482	-0,02	-1600	$0,4 \cdot 10^{-4}$	$256 \cdot 10^4$	
16	0,71	3051	-0,02	-2179	$0,4 \cdot 10^{-4}$	4748041	

$$K_{02} = \frac{0,49 + 0,53 + 0,56 + 0,59 + 0,61 + 0,63 + 0,65 + 0,66 + 0,67 + 0,7 + 0,69 + 0,7 + 0,7 + 0,71 + 0,71 + 0,71}{} = 0,69$$

$y_0 = 882,1$

Z: surat $7\ 33,46$

$\Sigma_1 = 0,26$

$\Sigma_2 = 13\ 407\ 076$

$\sqrt{3485\ 838} = 1867$

Z: $\frac{733}{1867} = 0,39$

```
package uz.pdp.lesson7;

import java.io.IOException;
import java.util.ArrayList;
import java.util.Scanner;

public class Main {
    public static void main(String[] args) throws IOException {
        Scanner scanner=new Scanner(System.in);
        System.out.println(" signallarning elementlari sonini kiriting");
        int a=scanner.nextInt();
        ArrayList<Integer> list=new ArrayList<>(a);
        for (int i = 0; i <a; i++) {
            System.out.println(i+"- elementni kiriting");
            list.add(scanner.nextInt());
        }
        System.out.println(" ikkinchiu signal elementlarini kiriting");
        ArrayList<Integer> list1=new ArrayList<>(a);
        for (int i = 0; i <a; i++) {
            System.out.println(i+" - elementni kiriting");
            list1.add(scanner.nextInt());
        }
        float summa=0;
         ArrayList<Float>list3=new ArrayList<>(a);
        for (int i = 0; i <a; i++){
            summa+=list.get(i);
        }
        System.out.println("1-signal o'rtacha qiymati "+summa/a);
        for (int i = 0; i <a; i++) {
            list3.add((float) ((summa/a)-list.get(i)));
            System.out.println(list3.get(i));
        }
```

```
        list3.add((float) ((summa/a)-list.get(i)));
        System.out.println(list3.get(i));
    }
    float summa1=0;
    for (int i = 0; i <a; i++){
        summa1+=list1.get(i);
    }
    System.out.println("2-signal o'rtacha qiymati  "+summa1 /a);
    ArrayList<Float>list4=new ArrayList<>(a);
        for (int i = 0; i <a; i++) {
    list4.add((float) ((summa1/a)-list1.get(i)));
    System.out.println(list3.get(i));
 }
    System.out.println("2-signal o'rtacha qiymatin  "+summa1/a);
    for (int i = 0; i <a; i++) {
    System.out.println("1-signal o'srtachasining kvadratlari=>
+Math.pow(summa/a-list.get(i),2));
 }
    for (int i = 0; i <a; i++) {
        System.out.println("2-signal o'srtachasining kvadratlari=>
+Math.pow(summa1/a-list1.get(i),2));

    }
    float summa2=0;
    for (int i = 0; i <a; i++) {
        summa2+=list3.get(i)*list4.get(i);
    }
float summa3=0;
    for (int i = 0; i <a; i++) {
        summa3+=Math.pow(list3.get(i),2)+Math.pow(list4.get(i),2);
    }
    System.out.println("yakuniy natijas=>   "+summa2/summa3);
 }
```

pdp | Version control | uz.pdp.lesson7.Main

Project | Task1.java | CalendarExample.java | LocalDateExample.java | lesson7\Main.java | UserDTO.java | oxford.txt | Model\Main.java

Run | uz.pdp.lesson7.Main

```
C:\Users\user\.jdks\openjdk-20.0.1\bin\java.exe -javaagent:C:\Users\user\AppData\Local\JetBrains\Toolbox\apps\IDEA-C\ch-0\231.9392.1\lib\idea_rt
.jar=14922:C:\Users\user\AppData\Local\JetBrains\Toolbox\apps\IDEA-C\ch-0\231.9392.1\bin -Dfile.encoding=UTF-8 -Dsun.stdout.encoding=UTF-8 -Dsun.stderr
.encoding=UTF-8 -classpath "D:\pdp\out\production\pdp.Modul4.Task4;D:\modul3.Bahodirov Samandar\javafaker-1.0.2.jar" uz.pdp.lesson7.Main
signallarning elementlari sonini kiriting
12
0- elementni kiriting
5
1- elementni kiriting
13
2- elementni kiriting
11
3- elementni kiriting
8
4- elementni kiriting
6
5- elementni kiriting
17
6- elementni kiriting
15
7- elementni kiriting
4
8- elementni kiriting
9
9- elementni kiriting
7
10- elementni kiriting
10
```

Hide all

B_samandar03
qo'qon shaxar aziz tepa 42-uy

B_samandar03
Орта шахрихон шокирбой махалла 228-уй

Qondoshlar... → ...
Mahliyo: #MashaAlloh Sizchi siz ulgurdingizmi.? ➪@Ona_haqida_s...

pdp > lesson7 > Main

64:1 (2263 chars

ENG 23:10 12.10.2023

pdp Version control uz.pdp.lesson7.Main

Project Task1.java CalendarExample.java LocalDateExample.java lesson7\Main.java UserDTO.java oxford.txt Model\Main.java

Run uz.pdp.lesson7.Main

```
11- elementni kiriting
12
 ikkinchiu signal elementlarini kiriting
0 - elementni kiriting
17
1 - elementni kiriting
23
2 - elementni kiriting
20
3 - elementni kiriting
19
4 - elementni kiriting
13
5 - elementni kiriting
7
6 - elementni kiriting
11
7 - elementni kiriting
29
8 - elementni kiriting
31
9 - elementni kiriting
18
10 - elementni kiriting
12
11 - elementni kiriting
21
```

Hide all

Dunyo TV → B_samandar03
⚡ Исроилнинг Газони бомбардимон қилиш оқибат...

SPORT TV (Rasmiy kanal) → B...
Ayni damda SPORT telekanalida "Markaziy uchrash...

Sara Xabarlar - Tezkor Yangili...
Исроил армияси собиқ аскарининг иқрори: "Ўлдирга...

pdp > lesson7 > Main 64:1 (2263 chars

ENG 23:10 12.10.2023

pdp Version control uz.pdp.lesson7.Main

Project Task1.java CalendarExample.java LocalDateExample.java lesson7\Main.java UserDTO.java oxford.txt Model\Main.java

Run uz.pdp.lesson7.Main

```
1-signal o'rtacha qiymati 9.75
4.75
-3.25
-1.25
1.75
3.75
-7.25
-5.25
5.75
0.75
2.75
-0.25
-2.25
2-signal o'rtacha qiymati  18.416666
4.75
-3.25
-1.25
1.75
3.75
-7.25
-5.25
5.75
0.75
2.75
-0.25
-2.25
2-signal o'rtacha qiymatin  18.416666
```

Hide all

pdp > lesson7 > Main 64:1 (2263 chars, 63 line breaks) CRLF UTF-8 4 spaces

ENG 23:10 12.10.2023

pdp | Version control | uz.pdp.lesson7.Main

Project | Task1.java | CalendarExample.java | LocalDateExample.java | lesson7\Main.java | UserDTO.java | oxford.txt | Model\Main.java

Run | uz.pdp.lesson7.Main

```
-2.25
2-signal o'rtacha qiymatin  18.416666
1-signal o'srtachasining kvadratlari=> 22.5625
1-signal o'srtachasining kvadratlari=> 10.5625
1-signal o'srtachasining kvadratlari=> 1.5625
1-signal o'srtachasining kvadratlari=> 3.0625
1-signal o'srtachasining kvadratlari=> 14.0625
1-signal o'srtachasining kvadratlari=> 52.5625
1-signal o'srtachasining kvadratlari=> 27.5625
1-signal o'srtachasining kvadratlari=> 33.0625
1-signal o'srtachasining kvadratlari=> 0.5625
1-signal o'srtachasining kvadratlari=> 7.5625
1-signal o'srtachasining kvadratlari=> 0.0625
1-signal o'srtachasining kvadratlari=> 5.0625
2-signal o'srtachasining kvadratlari=>  2.006942643060029
2-signal o'srtachasining kvadratlari=>  21.00695027245456
2-signal o'srtachasining kvadratlari=>  2.5069464577572944
2-signal o'srtachasining kvadratlari=>  0.34027851952487254
2-signal o'srtachasining kvadratlari=>  29.34027089013034
2-signal o'srtachasining kvadratlari=>  130.3402632607358
2-signal o'srtachasining kvadratlari=>  55.0069350136655
2-signal o'srtachasining kvadratlari=>  112.00695790184909
2-signal o'srtachasining kvadratlari=>  158.34029377831394
2-signal o'srtachasining kvadratlari=>  0.17361058129245066
2-signal o'srtachasining kvadratlari=>  41.17360295189792
2-signal o'srtachasining kvadratlari=>  6.673614395989716
yakuniy natijas=>   -0.19500342
```

pdp > lesson7 > Main

64:1 (2263 chars

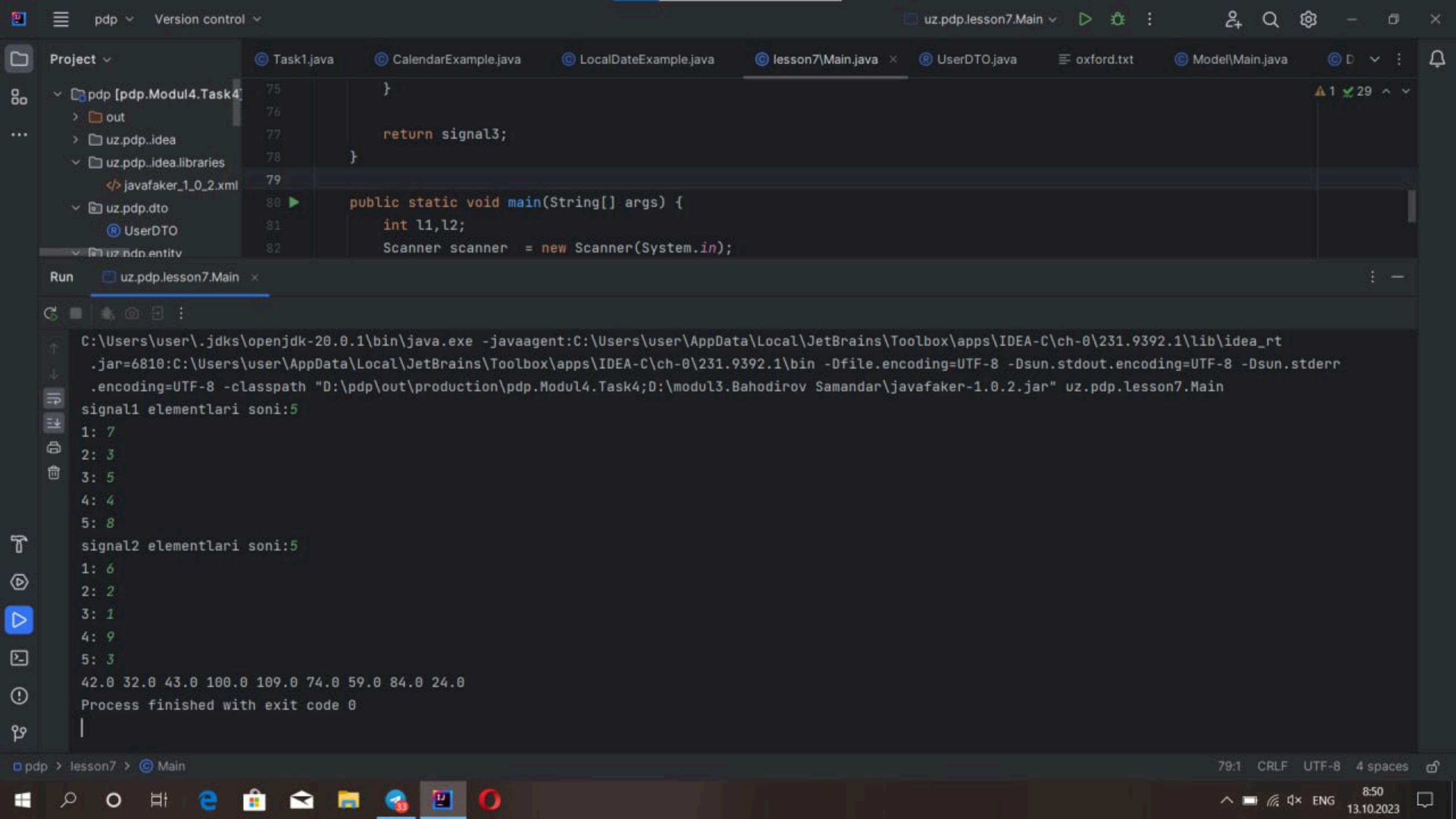
Hide all

18:30 EVEN - THE LIMITLESS ...
Og'abek: Photo

18:30 EVEN - THE LIMITLESS ...
Assalomu alaykum irregular :مدينة
...verbsni ham rasmini tashab beri

18:30 EVEN - THE LIMITLESS ...
Og'abek: the board 20 sentences essential 4 tarjima Round up 12...

ENG 23:10 12.10.2023


pdp
Version control
uz.pdp.lesson7.Main
Project
Task1.java
CalendarExample.java
LocalDateExample.java
lesson7\Main.java
UserDTO.java
oxford.txt
Model\Main.java
pdp [pdp.Modul4.Task4]
out
uz.pdp..idea
uz.pdp..idea.libraries
javafaker_1_0_2.xml
uz.pdp.dto
UserDTO
uz.pdp.entity
}
return signal3;
}
public static void main(String[] args) {
int l1,l2;
Scanner scanner = new Scanner(System.in);
Run
uz.pdp.lesson7.Main
C:\Users\user\.jdks\openjdk-20.0.1\bin\java.exe -javaagent:C:\Users\user\AppData\Local\JetBrains\Toolbox\apps\IDEA-C\ch-0\231.9392.1\lib\idea_rt.jar=6810:C:\Users\user\AppData\Local\JetBrains\Toolbox\apps\IDEA-C\ch-0\231.9392.1\bin -Dfile.encoding=UTF-8 -Dsun.stdout.encoding=UTF-8 -Dsun.stderr.encoding=UTF-8 -classpath "D:\pdp\out\production\pdp.Modul4.Task4;D:\modul3.Bahodirov Samandar\javafaker-1.0.2.jar" uz.pdp.lesson7.Main
signal1 elementlari soni:5
1: 7
2: 3
3: 5
4: 4
5: 8
signal2 elementlari soni:5
1: 6
2: 2
3: 1
4: 9
5: 3
42.0 32.0 43.0 100.0 109.0 74.0 59.0 84.0 24.0
Process finished with exit code 0
pdp > lesson7 > Main
79:1
CRLF
UTF-8
4 spaces
ENG
8:50
13.10.2023

..