

Samarqand davlat universitetning Kattaqo'rg'on filiali Aniq va tabiiy fanlar fakulteti bahorgi semestr Matematika ta'lim yo'nalishi: 4-kurs talabalariga «Ehtimollar nazariyasi va matematik statistika» fanidan yakuniy nazorat savollari

Imtihon shakli: yozma, og'zaki

No	Mavzu	1-QISM “NAZARIY SAVOLLAR 1”	2-QISM “NAZARIY SAVOLLAR 2”	3-QISM “AMALIY SAVOLLAR 1”	4-QISM “AMALIY SAVOLLAR 2”	5-qism “AMALIY SAVOLLAR 3”																										
1	Matematik statistikaning predmeti va asosiy masalalari. Tanlanma	Matematik statistikaning predmetini ayting.	Matematik statistikaning vazifalarini keltiring. (birinchi va ikkinchi vazifasi)	Hajmi $n = 20$ bo‘lgan tanlanmaning chastotalari taqsimoti berilgan <table><tr><td>X</td><td>3</td><td>5</td><td>10</td></tr><tr><td>n</td><td>7</td><td>8</td><td>5</td></tr></table> Nisbiy chastotalar taqsimoti yozilsin.	X	3	5	10	n	7	8	5	Hajmi $n = 20$ bo‘lgan tanlanmaning chastotalari taqsimoti berilgan <table><tr><td>X</td><td>3</td><td>5</td><td>10</td></tr><tr><td>n</td><td>10</td><td>4</td><td>8</td></tr></table> Nisbiy chastotalar taqsimoti yozilsin.	X	3	5	10	n	10	4	8	Tanlanmaning quyida berilgan taqsimoti bo‘yicha empirik taqsimot funksiyasi tuzilsin: <table><tr><td>X</td><td>1</td><td>4</td><td>8</td></tr><tr><td>n</td><td>9</td><td>3</td><td>18</td></tr></table>	X	1	4	8	n	9	3	18		
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Bosh va tanlanma to‘plam deb nimaga aytiladi?	Tanlamalarning tiplari haqida ma’lumot bering.	Tanlanmaning quyida berilgan taqsimoti bo‘yicha empirik taqsimot funksiyasi tuzilsin: <table><tr><td>X</td><td>1</td><td>4</td><td>9</td></tr><tr><td>n</td><td>8</td><td>9</td><td>18</td></tr></table>	X	1	4	9	n	8	9	18	Tanlanmaning quyida berilgan taqsimoti bo‘yicha empirik taqsimot funksiyasi tuzilsin: <table><tr><td>X</td><td>2</td><td>4</td><td>5</td><td>8</td></tr><tr><td>n</td><td>9</td><td>8</td><td>5</td><td>3</td></tr></table>	X	2	4	5	8	n	9	8	5	3	Hajmi $n = 30$ bo‘lgan tanlanmaning chastotalari taqsimoti berilgan <table><tr><td>X</td><td>2</td><td>4</td><td>5</td><td>8</td></tr><tr><td>n</td><td>9</td><td>8</td><td>5</td><td>3</td></tr></table> Nisbiy chastotalar taqsimoti yozilsin.	X	2	4	5	8	n	9	8	5	3
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2	Tanlanmaning statistik taqsimoti.	Tanlanmalarni ng tanlash usullari(tipik,	Mexanik tanlash nima va unga misol keltiring	Gruppadagi o‘quvchilardan 10 nafarining bo‘ylari(sm)	Hajmi $n = 30$ bo‘lgan tanlanmaning chastotalari taqsimoti berilgan	Gruppadagi o‘quvchilardan 10 nafarining vaznlari (kg)																										

	Empirik taqsimot funksiyasi.	mexanik va seriyali tanlash)		o‘lchanib, quyidagi ma’lumotlar olindi: 145, 147, 151, 155, 163, 147,155, 155,174,163 Shu ma’lumotlarga ko‘ra statistik taqsimotni tuzing.	<table><tr><td>X</td><td>3</td><td>5</td><td>10</td></tr><tr><td>n</td><td>10</td><td>4</td><td>8</td></tr></table> Nisbiy chastotalar taqsimoti yozilsin.	X	3	5	10	n	10	4	8	o‘lchanib, quyidagi ma’lumotlar olindi: 68, 45, 55, 43, 68, 55, 61, 62, 43, 45 Shu ma’lumotlarga ko‘ra statistik taqsimotni tuzing.																											
		X	3	5	10																																				
		n	10	4	8																																				
Tanlanmaning statistik taqsimoti deb nimaga aytiladi?	Empirik taqsimot funksiyasi haqida malumot bering.	Tanlanma hajm $n \geq 30$ bo‘lganda statistik taqsimotini tuzishni tushuntiring	Tanlanma hajm $n \geq 30$ bo‘lganda statistik taqsimotini tuzishni tushuntiring va bitta misol keltiring	Tanlanmaning quyida berilgan ushbu taqsimoti bo‘yicha uning empirik funksiyasini toping va grafigini chizing: <table><tr><td>X</td><td>1</td><td>4</td><td>6</td></tr><tr><td>n</td><td>10</td><td>15</td><td>25</td></tr></table>	X	1	4	6	n	10	15	25																													
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Chastotalar poligoni va nisbiy chastotalar poligoni ta’riflarini keltiring.	Chastotalar gistogrammasi nima va uning grafigini yasashni tushuntiring. (uning yasalishi, gistogramma yuzi)	Tanlanmaning quyida berilgan ushbu taqsimoti bo‘yicha uning empirik funksiyasini toping va grafigini chizing: <table><tr><td>X</td><td>2</td><td>6</td><td>10</td></tr><tr><td>n</td><td>12</td><td>18</td><td>30</td></tr></table>	X	2	6	10	n	12	18	30	Tanlanmaning quyida berilgan ushbu taqsimoti bo‘yicha uning empirik funksiyasini toping va grafigini chizing: <table><tr><td>X</td><td>5</td><td>6</td><td>8</td><td>11</td></tr><tr><td>n</td><td>6</td><td>5</td><td>4</td><td>5</td></tr></table>	X	5	6	8	11	n	6	5	4	5	Tanlanmaning quyida berilgan ushbu taqsimoti bo‘yicha uning empirik funksiyasini toping va grafigini chizing: <table><tr><td>X</td><td>7</td><td>9</td><td>11</td><td>13</td></tr><tr><td>n</td><td>7</td><td>8</td><td>9</td><td>6</td></tr></table>	X	7	9	11	13	n	7	8	9	6									
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3	Statistik baho. Statistik bahoga qo‘yiladigan talablar.	Taqsimot parametrlarining statistik baholari haqida ma’lumot bering.	<u>Siljimagan, effektiv va asosli baholar deb nimaga aytiladi?</u>	Tanlanmaning quyida berilgan taqsimoti bo‘yicha chastotalar poligonini yasang: <table><tr><td>X</td><td>5</td><td>6</td><td>8</td><td>11</td></tr><tr><td>n</td><td>6</td><td>5</td><td>4</td><td>5</td></tr></table>	X	5	6	8	11	n	6	5	4	5	Tanlanmaning quyida berilgan taqsimoti bo‘yicha chastotalar poligonini yasang: <table><tr><td>X</td><td>7</td><td>9</td><td>11</td><td>13</td></tr><tr><td>n</td><td>7</td><td>8</td><td>9</td><td>6</td></tr></table>	X	7	9	11	13	n	7	8	9	6	Juxori donidan 100 dona olindi va ularning har birini tortib ko‘rib quyidagi statistik taqsimot olindi: <table><tr><td>Gr</td><td>0.1</td><td>0.3</td><td>0.5</td><td>0.7</td></tr><tr><td>-</td><td>0.3</td><td>0.5</td><td>0.7</td><td>0.9</td></tr><tr><td>so ni</td><td>18</td><td>52</td><td>18</td><td>12</td></tr></table> Shu taqsimotning gistogrammasini tuzing	Gr	0.1	0.3	0.5	0.7	-	0.3	0.5	0.7	0.9	so ni	18	52	18	12
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so ni	18	52	18	12																																					

		Bosh oʻrtacha qiymat taʼrifini keltiring.	Oʻrtacha tanlanma qiymat taʼrifini keltiring.	Tanlanma toʻplam taqsimoti berilgan: <table><tr><td>X</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>n</td><td>20</td><td>15</td><td>10</td><td>5</td></tr></table> Tanlanma dispersiyasi va oʻrtacha kvadratik chetlanishini toping.	X	1	2	3	4	n	20	15	10	5	Tanlanma toʻplam taqsimoti berilgan: <table><tr><td>X</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>n</td><td>10</td><td>15</td><td>20</td><td>10</td></tr></table> Tanlanma dispersiyasi va oʻrtacha kvadratik chetlanishini toping.	X	1	2	3	4	n	10	15	20	10	Tanlanma toʻplam taqsimoti berilgan: <table><tr><td>X</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>n</td><td>30</td><td>15</td><td>25</td><td>20</td></tr></table> Tanlanma dispersiyasi va oʻrtacha kvadratik chetlanishini toping.	X	1	2	3	4	n	30	15	25	20
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n	30	15	25	20																																
4	Tanlanma oʻrtacha va tanlanma dispersiya	Bosh dispersiya nima va u qaysi formulalar boʻyicha hisoblanadi?	Tanlanma dispersiya nima va u qaysi formulalar boʻyicha hisoblanadi?	Quyidagi statistik taqsimot berilgan: <table><tr><td>X</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>n</td><td>1</td><td>4</td><td>10</td><td>39</td></tr></table> $\bar{x}, D, \sigma, M_0$ larni toping.	X	1	2	3	4	n	1	4	10	39	Quyidagi statistik taqsimot berilgan: <table><tr><td>X</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>n</td><td>20</td><td>15</td><td>10</td><td>5</td></tr></table> $\bar{x}, D, \sigma, M_0$ larni toping	X	1	2	3	4	n	20	15	10	5	Quyidagi statistik taqsimot berilgan: <table><tr><td>X</td><td>5</td><td>6</td><td>8</td><td>11</td></tr><tr><td>n</td><td>6</td><td>5</td><td>4</td><td>5</td></tr></table> $\bar{x}, D, \sigma, M_0$ larni toping	X	5	6	8	11	n	6	5	4	5
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5-6	Intervalli baholar. Ishonchlilik intervali.	Bahoning ishonchliligi taʼrifini keltiring.(baho ning aniqligi, ishonchlilik)	Baholashning usullari haqida ayting.	Tanlanmaning berilgan <table><tr><td>X</td><td>125</td><td>127</td><td>128</td></tr><tr><td>n</td><td>2</td><td>5</td><td>3</td></tr></table> Statistik taqsimotlari boʻyicha tanlanma qiymatini va dispersiyasini toping.	X	125	127	128	n	2	5	3	Tanlanmaning berilgan <table><tr><td>X</td><td>256</td><td>260</td><td>265</td></tr><tr><td>n</td><td>2</td><td>3</td><td>10</td></tr></table> Statistik taqsimotlari boʻyicha tanlanma qiymatini va dispersiyasini toping.	X	256	260	265	n	2	3	10	Tanlanmaning quyida berilgan taqsimoti boʻyicha chastotalar poligonini yasang: <table><tr><td>X</td><td>7</td><td>9</td><td>11</td><td>13</td></tr><tr><td>n</td><td>7</td><td>8</td><td>9</td><td>6</td></tr></table>	X	7	9	11	13	n	7	8	9	6				
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Styudent taqsimoti haqida nimalarni bilasiz?	Xi taqsimoti va styudent taqsimoti haqida nimalarni bilasiz?	Bosh toʻplamdan $n = 60$ hajmli tanlanma olingan: <table><tr><td>X</td><td>1</td><td>3</td><td>6</td><td>26</td></tr><tr><td>n</td><td>8</td><td>40</td><td>10</td><td>2</td></tr></table> Bosh oʻrtacha qiymatning siljimagan bahosini toping.	X	1	3	6	26	n	8	40	10	2	Bosh toʻplamdan $n = 50$ hajmli tanlanma olingan: <table><tr><td>X</td><td>1</td><td>3</td><td>6</td><td>26</td></tr><tr><td>n</td><td>5</td><td>30</td><td>5</td><td>10</td></tr></table> Bosh oʻrtacha qiymatning siljimagan bahosini toping.	X	1	3	6	26	n	5	30	5	10	Bosh toʻplamdan $n = 60$ hajmli tanlanma olingan: <table><tr><td>X</td><td>1</td><td>3</td><td>6</td><td>26</td></tr><tr><td>n</td><td>7</td><td>20</td><td>30</td><td>3</td></tr></table> Bosh oʻrtacha qiymatning siljimagan bahosini toping.	X	1	3	6	26	n	7	20	30	3		
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Ishonchlilik intervali deb nimaga aytiladi?	Normal taqsimotning oʻrtacha kvadratik chetlanishini baholash uchun ishonchlilik intervali qanday	$n = 51$ hajmli tanlanma boʻyicha bosh dispersiyaning $D_T = 5$ siljigan bahosi topilgan. Bosh toʻplam dispersiyasining siljimagan bahosini	$n = 45$ hajmli tanlanma boʻyicha bosh dispersiyaning $D_T = 4$ siljigan bahosi topilgan. Bosh toʻplam dispersiyasining siljimagan bahosini toping.	$n = 61$ hajmli tanlanma boʻyicha bosh dispersiyaning $D_T = 6$ siljigan bahosi topilgan. Bosh toʻplam dispersiyasining siljimagan bahosini																																

			topiladi?	toping.		toping
7	Normal taqsimotning nomalum parametrlari uchun ishonchlilik intervallari	Tasodifiy miqdorlar orasidagi bog'liqlik turlarini aytib bering.	Shartli o'rtacha qiymat deb nimaga aytiladi?	X tasodifiy miqdor $\sigma = 3$ o'rtacha kvadratik chetlanishi ma'lum bo'lgan normal taqsimotga ega. Agar tanlanma hajmi $n = 36$ bo'lib bahoning $\gamma = 0,95$ ishonchliligi berilgan bo'lsa, noma'lum a matematik kutilmani $\bar{x}$ o'rtacha tanlanma qiymat bo'yicha baholash uchun ishonchlilik intervali topilsin.	Bosh to'plamning X miqdoriy belgisi normal taqsimlangan. $n = 16$ hajmli tanlanma bo'yicha $\bar{x} = 20,2$ o'rtacha tanlanma qiymat va $s = 0,8$ tuzatilgan o'rtacha kvadratik chetlanish topilgan. Noma'lum a matematik kutilma $\gamma = 0,95$ ishonchlilik bilan ishonchlilik intervali yordamida baholansin.	Normal taqsimlangan X miqdoriy belgini o'rtacha kvadratik chetlanishi $\sigma = 2$, tanlanmaning o'rtacha qiymati $\bar{x} = 5.4$ va tanlanma hajmi $n = 10$ bo'lsa, uning noma'lum a matematik kutilishiga $\gamma = 0,95$ ishonchlilik bilan ishonchlilik intervalini tuzing.
8	Korrelyatsiya viy va regressiyaviy tahlil elementlari	Regressiya tanlama tenglamalarini yozing.	Regressiya tanlanma tenglamasini guruhlangan ma'lumotlar bo'yicha topish	Bug'doy donining oqsiliy aniqlaganda quyidagi ma'lumotlar olingan: $\bar{x} = 14,80\%$. Tanlanma o'rtachasining nisbiy xatosi $S_x = 0.20\%, n = 4$ Bosh o'rtacha uchun 95% li ishonchli intervalni toping.	Bug'doy donining oqsiliy aniqlaganda quyidagi ma'lumotlar olingan: $\bar{x} = 14,80\%$. Tanlanma o'rtachasining nisbiy xatosi $S_x = 0.20\%, n = 4$ Bosh o'rtacha uchun 99% li ishonchli intervalni toping.	Bosh to'plamning X miqdoriy belgisi normal taqsimlangan. $n = 16$ hajmli tanlanma bo'yicha $\bar{x} = 20,2$ o'rtacha tanlanma qiymat va $s = 0,8$ tuzatilgan o'rtacha kvadratik chetlanish topilgan. Noma'lum a matematik kutilma $\gamma = 0,95$ ishonchlilik

						bilan ishonchlilik intervali yordamida baholansin.																
	Regressiya tanlanma tenglamasi	Regressiya tenglamasini guruhlanmagan ma'lumotlar bo'yicha topish	Korrelyatsion jadval ta'rifini keltiring.	$X - 1; 1,5; 3; 4,5; 5$ $Y - 1,25; 1,4; 1,5; 1,75; 2,25.$ Y ning X ga regressiya to'g'ri chizig'ining tanlanma tenglamasi $n = 5$ ta kuzatish mlumotlari yuqoridagi jadval bo'yicha topilsin	Tanlanmaning berilgan <table><tr><td>X</td><td>256</td><td>260</td><td>265</td></tr><tr><td>n</td><td>2</td><td>3</td><td>10</td></tr></table> Statistik taqsimotlari bo'yicha tanlanma qiymatini va dispersiyasini toping.	X	256	260	265	n	2	3	10	Tanlanmaning berilgan <table><tr><td>X</td><td>250</td><td>260</td><td>265</td></tr><tr><td>n</td><td>5</td><td>15</td><td>10</td></tr></table> Statistik taqsimotlari bo'yicha tanlanma qiymatini va dispersiyasini toping.	X	250	260	265	n	5	15	10
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9	Tanlanma korrelyatsiya koeffitsienti va uning xossalari	Korrelyatsiyaviy moment va korrelyatsiya koeffitsienti haqida ma'lumot bering.	Tanlanma korrelyatsiya koeffitsienti ta'rifini keltiring.	X va Y normal bosh to'plamlardan olingan ikkita $n_1 = 12$ va $n_2 = 15$ hajmli hajmli bog'liqmas tanlanmalar bo'yicha $s_X^2 = 11,41$ va $s_Y^2 = 6,52$ tuzatilgan tanlanma dispersiyalar topilgan. 0,05 qiymatdorlik darajasida bosh dispersiyalarning tengligi haqidagi $H_0: D(X) = D(Y)$ nolinchi gipoteza konkurent gipoteza	X va Y normal bosh to'plamlardan olingan ikkita $n_1 = 10$ va $n_2 = 18$ hajmli hajmli bog'liqmas tanlanmalar bo'yicha $s_X^2 = 1,23$ va $s_Y^2 = 0,41$ tuzatilgan tanlanma dispersiyalar topilgan. 0,1 qiymatdorlik darajasida bosh dispersiyalarning tengligi haqidagi $H_0: D(X) = D(Y)$ nolinchi gipoteza konkurent gipoteza $H_1: D(X) \neq D(Y)$	$X - 1; 1,5; 3; 4,5; 5$ $Y - 1,25; 1,4; 1,5; 1,75; 2,25.$ Y ning X ga regressiya to'g'ri chizig'ining tanlanma tenglamasi $n = 5$ ta kuzatish mlumotlari yuqoridagi jadval bo'yicha topilsin.																

				$H_1: D(X) > D(Y)$ bo'lganda tekshirilsin.	bo'lganda tekshirilsin.																																																																	
10	Tanlanma korrelyatsiyaviy nisbat	Tanlanma korrelyatsiyaviy nisbat deb nimaga aytiladi?	Tanlanma korrelyatsiyaviy nisbatning xossalari ayting.	Tanlanmaning quyidagi berilgan taqsimoti bo'yicha chastotalar gistogrammasini yasang <table><tr><td>Intervallar ro'yxati</td><td>Qismaniy intervallar</td><td>Qismaniy intervallardagi variantalar chastotalarining yig'indisi</td></tr><tr><td>i</td><td>$x_i - x_{i-1}$</td><td>n_i</td></tr><tr><td>1</td><td>2-5</td><td>6</td></tr><tr><td>2</td><td>5-8</td><td>10</td></tr><tr><td>3</td><td>8-11</td><td>4</td></tr><tr><td>4</td><td>11-14</td><td>5</td></tr><tr><td></td><td></td><td>$n = \sum n_i = 25$</td></tr></table>	Intervallar ro'yxati	Qismaniy intervallar	Qismaniy intervallardagi variantalar chastotalarining yig'indisi	i	$x_i - x_{i-1}$	n_i	1	2-5	6	2	5-8	10	3	8-11	4	4	11-14	5			$n = \sum n_i = 25$	10 ta erkli o'lchashlar natijasida sterjen uzunligi (mm) uchun quyidagi ma'lumotlar olingan: 23, 24, 23, 25, 25, 26, 26, 25, 24, 25. O'lchash xatoligini normal taqsimlangan deb faraz qilib, sterjen uzunligining matematik kutilmasi uchun $g = 0,95$ ishonchlilik bilan ishonch intervalini toping	Bosh to'plamning X-son belgisi normal taqsimlangan. n hajmli tanlanma bo'yicha «tuzatilgan» o'rtacha kvadratik chetlanishi topilgan. Bosh to'plam o'rtacha kvadratik chetlanishi σ ni $g = 0,99$ ishonchlilik bilan qoplaydigan ishonch oralig'ini toping, bunda $n = 10, s = 5,1$.																																											
Intervallar ro'yxati		Qismaniy intervallar	Qismaniy intervallardagi variantalar chastotalarining yig'indisi																																																																			
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4	11-14	5																																																																				
		$n = \sum n_i = 25$																																																																				
	Shartli o'rtacha qiymatlar haqida ma'lumot bering.	Regressiya tanlanma tenglamasini guruhlanmagan ma'lumotlar bo'yicha topish	X diskret tasodifiy miqdorning taqsimoti quyidagicha: <table><tr><td>X</td><td>2</td><td>3</td></tr><tr><td>p</td><td>0,6</td><td>0.4</td></tr></table> $Y = X^2$ funksiyaning taqsimoti topilsin.	X	2	3	p	0,6	0.4	Berilgan jadvaldan foydalanib, tanlanma shartli o'rtacha - $\overline{y_x}$ ni toping. <table><tr><td>$\begin{matrix} X \\ Y \end{matrix}$</td><td>3</td><td>4</td><td>6</td><td>7</td><td>8</td><td>n_j</td></tr><tr><td>8</td><td>5</td><td>3</td><td>-</td><td>-</td><td>-</td><td>8</td></tr><tr><td>12</td><td>3</td><td>4</td><td>5</td><td>4</td><td>2</td><td>18</td></tr><tr><td>15</td><td>-</td><td>3</td><td>3</td><td>6</td><td>2</td><td>14</td></tr><tr><td>n_x</td><td>8</td><td>10</td><td>8</td><td>10</td><td>4</td><td>$n = 30$</td></tr></table>	$\begin{matrix} X \\ Y \end{matrix}$	3	4	6	7	8	n_j	8	5	3	-	-	-	8	12	3	4	5	4	2	18	15	-	3	3	6	2	14	n_x	8	10	8	10	4	$n = 30$	Berilgan jadvaldan foydalanib, tanlanma shartli o'rtacha - $\overline{y_x}$ ni toping. <table><tr><td>$\begin{matrix} X \\ Y \end{matrix}$</td><td>3</td><td>3,5</td><td>4</td><td>4,5</td><td>5</td></tr><tr><td>7</td><td>5</td><td>3</td><td>-</td><td>-</td><td>-</td></tr><tr><td>9</td><td>2</td><td>3</td><td>5</td><td>3</td><td>1</td></tr><tr><td>13</td><td>-</td><td>1</td><td>1</td><td>2</td><td>2</td></tr></table>	$\begin{matrix} X \\ Y \end{matrix}$	3	3,5	4	4,5	5	7	5	3	-	-	-	9	2	3	5	3	1	13	-	1	1	2	2
X	2	3																																																																				
p	0,6	0.4																																																																				
$\begin{matrix} X \\ Y \end{matrix}$	3	4	6	7	8	n_j																																																																
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15	-	3	3	6	2	14																																																																
n_x	8	10	8	10	4	$n = 30$																																																																
$\begin{matrix} X \\ Y \end{matrix}$	3	3,5	4	4,5	5																																																																	
7	5	3	-	-	-																																																																	
9	2	3	5	3	1																																																																	
13	-	1	1	2	2																																																																	
11	Statistik gipotezalar va ularning tasnifi.	Statistik gipotezalar (Asosiy , muqobil, oddiy va murakkab gipotezalar)	Statistik gipotezalar va ularning tasnifi.	Berilgan jadvaldan foydalanib, tanlanma shartli o'rtacha- $\overline{x_y}$ ni toping. <table><tr><td>$\begin{matrix} X \\ Y \end{matrix}$</td><td>4</td><td>4,5</td><td>5</td><td>5,5</td><td>6</td></tr><tr><td>8</td><td>5</td><td>3</td><td>-</td><td>-</td><td>-</td></tr><tr><td>10</td><td>2</td><td>4</td><td>5</td><td>4</td><td>3</td></tr><tr><td>13</td><td>-</td><td>1</td><td>1</td><td>2</td><td>2</td></tr></table>	$\begin{matrix} X \\ Y \end{matrix}$	4	4,5	5	5,5	6	8	5	3	-	-	-	10	2	4	5	4	3	13	-	1	1	2	2	Hajmi $n = 5$ bo'lgan tanlanmaning quyidagi taqsimoti bo'yicha Y ning X ga regressiya to'g'ri chiziqli tanlanma tenglamasini toping. $x_i: 1 \quad 1,5 \quad 3 \quad 4,5 \quad 5$ $y_i: 1,25 \quad 1,4 \quad 1,5 \quad 1,75 \quad 2,25$	Berilgan jadvaldan foydalanib, tanlanma shartli o'rtacha - $\overline{y_x}$ ni toping. <table><tr><td>$\begin{matrix} X \\ Y \end{matrix}$</td><td>3</td><td>4</td><td>6</td><td>7</td><td>8</td><td>n_j</td></tr><tr><td>8</td><td>5</td><td>3</td><td>-</td><td>-</td><td>-</td><td>8</td></tr><tr><td>12</td><td>3</td><td>4</td><td>5</td><td>4</td><td>2</td><td>18</td></tr><tr><td>15</td><td>-</td><td>3</td><td>3</td><td>6</td><td>2</td><td>14</td></tr><tr><td>n_x</td><td>8</td><td>10</td><td>8</td><td>10</td><td>4</td><td>$n = 30$</td></tr></table>	$\begin{matrix} X \\ Y \end{matrix}$	3	4	6	7	8	n_j	8	5	3	-	-	-	8	12	3	4	5	4	2	18	15	-	3	3	6	2	14	n_x	8	10	8	10	4	$n = 30$					
$\begin{matrix} X \\ Y \end{matrix}$		4	4,5	5	5,5	6																																																																
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n_x	8	10	8	10	4	$n = 30$																																																																

Fisher-Sinedikor taqsimoti haqida ma'lumot keltiring.

Mezon quvvati deb nimaga aytiladi?

Tanlanmaning quyidagi jadvali yordamida Y ning X ga to'g'ri chiziqli regressiya tanlanma tenglamasini tuzing.

X	10	2	7	5
Y	8	2	6	4

Cho'chqa bolasining og'irligi Y (kg.) va yoshi X (haftalarda) orasidagi bog'lanish quyidagi jadval bilan berilgan.

x	0	1	2	3	4	5	6	7	8
y	1,3	2,5	3,9	5,2	5,3	7,5	9,0	10,8	13,1

Shu ma'lumotlar bo'yicha tanlanma korrelyatsiya koeffitsientini toping

n = 50 hajmli quyidagi korrelyatsion jadval bo'yicha Y belgining X belgiga korrelyatsion nisbati n_{yx} ni toping.

	X	10	20	30	n_y
Y					
15		4	28	6	38
25		6	-	6	12
n_x		10	28	12	n = 50
$\overline{y_x}$		21	15	20	

Birinchi va ikkinchi tur xatolar ta'rifini keltiring.

Statistik mezon deb nimaga aytiladi?

X va Y normal bosh to'plamlardan olingan ikkita $n_1 = 10$ va $n_2 = 18$ hajmli hajmli bog'liqmas tanlanmalar bo'yicha $s_x^2 = 1,23$ va $s_y^2 = 0,41$ tuzatilgan tanlanma dispersiyalar topilgan. 0,1 qiymatdorlik darajasida bosh dispersiyalarning tengligi haqidagi $H_0: D(X) = D(Y)$ nolinni gipoteza konkurent gipoteza $H_1: D(X) \neq D(Y)$ bo'lganda tekshirilsin.

X diskret tasodifiy miqdorning taqsimoti quyidagicha:

X	2	3
p	0,6	0.4

$Y = X^2$ funksiyaning taqsimoti topilsin.

Berilgan jadval bo'yicha X va Y tasodifiy miqdorlarning tanlanma korrelyatsiya koeffitsienti topilsin.

X	-1	3	4	0	2	3	1	4
Y	2	0	1	-1	1	1	2	0

12	Statistik mezon	Kritik soha va kritik nuqtalar	Kritik sohalar qanday topiladi?	Normal taqsimlangan X va Y bosh to'plamlardan	Tanlanma to'plam taqsimoti berilgan:	Bosh to'plamning X miqdoriy belgisi normal
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haqida ma'lumot keltiring.		olingan $n_1 = 11$ va $n_2 = 14$ hajmli ikkita erkli tanlanma bo'yicha «tuzatilgan» dispersiyalar: $s_x^2 = 0,76$, $s_y^2 = 0,38$ topilgan. $a = 0,05$ muhimlilik darajasida quyidagi gipotezani tekshiring: $H_0 : D(X) = D(Y)$; $H_1 : D(X) > D(Y)$	<table><tr><td>X</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>n</td><td>20</td><td>15</td><td>10</td><td>5</td></tr></table> Tanlanma dispersiyasi va o'rtacha kvadratik chetlanishini toping.	X	1	2	3	4	n	20	15	10	5	taqsimlangan. $n = 16$ hajmli tanlanma bo'yicha $\bar{x} = 20,2$ o'rtacha tanlanma qiymat va $s = 0,8$ tuzatilgan o'rtacha kvadratik chetlanish topilgan. Noma'lum a matematik kutilma $\gamma = 0,95$ ishonchlilik bilan ishonchlilik intervali yordamida baholansin.										
X	1	2	3	4																				
n	20	15	10	5																				
Ikkita normal bosh to'plamning dispersiyalarini taqqoslash	Ikkita normal bosh to'plamning o'rtacha qiymatlarini taqqoslash	Cho'chqa bolasining og'irligi Y (kg.) va yoshi X (haftalarda) orasidagi bog'lanish quyidagi jadval bilan berilgan. <table><tr><td>x</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td></tr><tr><td>y</td><td>1,3</td><td>2,5</td><td>3,9</td><td>5,2</td><td>5,3</td><td>7,5</td><td>9,0</td><td>10,8</td><td>13,1</td></tr></table> Shu ma'lumotlar bo'yicha tanlanma korrelyatsiya koeffitsientini toping	x	0	1	2	3	4	5	6	7	8	y	1,3	2,5	3,9	5,2	5,3	7,5	9,0	10,8	13,1	Normal taqsimlangan X va Y bosh to'plamlardan hajmlari mos ravishda n_1 va n_2 bo'lgan ikkita erkli tanlanma ajratib olingan va ularning «tuzatilgan» dispersiyalari: s_x^2 va s_y^2 topilgan. a muhimlilik darajasida $H_0 : D(X) = D(Y)$ asosiy gipotezani tekshiring, bunda $H_1 : D(X) > D(Y)$ $n_1 = 10, n_2 = 15, S_x^2 = 3,6, S_y^2 = 2,4$ $a = 0,05$	Normal taqsimlangan X va Y bosh to'plamlardan hajmlari mos ravishda n_1 va n_2 bo'lgan ikkita erkli tanlanma ajratib olingan va ularning «tuzatilgan» dispersiyalari: s_x^2 va s_y^2 topilgan. a muhimlilik darajasida $H_0 : D(X) = D(Y)$ asosiy gipotezani tekshiring, bunda $H_1 : D(X) > D(Y)$ $n_1 = 13, n_2 = 18, S_x^2 = 3,6, S_y^2 = 4,8$ $a = 0,01$
x	0	1	2	3	4	5	6	7	8															
y	1,3	2,5	3,9	5,2	5,3	7,5	9,0	10,8	13,1															
Asosiy , muqobil, oddiy va murakkab gipotezalar ta'riflarini keltiring.	Tanlanma korrelyatsiyaviy nisbat nima va uning xossalarini aytib bering.	Statistik gipoteza nima va unga misollar keltiring.	Tanlanmaning berilgan <table><tr><td>X</td><td>256</td><td>260</td><td>265</td></tr><tr><td>n</td><td>2</td><td>3</td><td>10</td></tr></table> Statistik taqsimotlari bo'yicha tanlanma qiymatini va dispersiyasini	X	256	260	265	n	2	3	10	Normal taqsimlangan X va Y bosh to'plamlardan hajmlari mos ravishda n_1 va n_2 bo'lgan ikkita erkli tanlanma ajratib olingan va ularning «tuzatilgan»												
X	256	260	265																					
n	2	3	10																					

					toping.	dispersiyalari: s_x^2 va s_y^2 topilgan. a muhimlik darajasida $H_0 : D(X) = D (Y)$ asosiy gipotezani tekshiring, bunda $H_1 : D(X) > D (Y)$ $n_1 = 16, n_2 = 12, S_x^2 = 0,72, S_y^2 = 2,4, a = 0,05$																																					
13	Muvofiqlik mezonlari	Muvofiqlik mezonini deb nimaga aytiladi?	Pirsonning muvofiqlik mezonini keltiring	10 ta erkli o‘lchashlar natijasida sterjen uzunligi (mm) uchun quyidagi ma’lumotlar olingan: 23, 24, 23, 25, 25, 26, 26, 25, 24, 25. O‘lchash xatoligini normal taqsimlangan deb faraz qilib, sterjen uzunligining matematik kutilmasi uchun $g = 0,95$ ishonchlilik bilan ishonch intervalini toping	$n = 50$ hajmli quyidagi korrelyatsion jadval bo‘yicha Y belgining X belgiga korrelyatsion nisbati n_{yx} ni toping. <table><tr><td>$\begin{matrix} X \\ Y \end{matrix}$</td><td>10</td><td>20</td><td>30</td><td>n_y</td></tr><tr><td>15</td><td>4</td><td>28</td><td>6</td><td>38</td></tr><tr><td>25</td><td>6</td><td>-</td><td>6</td><td>12</td></tr><tr><td>n_x</td><td>10</td><td>28</td><td>12</td><td>$n = 50$</td></tr><tr><td>$\overline{y_x}$</td><td>21</td><td>15</td><td>20</td><td></td></tr></table>	$\begin{matrix} X \\ Y \end{matrix}$	10	20	30	n_y	15	4	28	6	38	25	6	-	6	12	n_x	10	28	12	$n = 50$	$\overline{y_x}$	21	15	20		Hajmi $n = 5$ bo‘lgan tanlanmaning quyidagi taqsimoti bo‘yicha Y ning X ga regressiya to‘g‘ri chiziqli tanlanma tenglamasini toping. <table><tr><td>x_i:</td><td>1</td><td>1,5</td><td>3</td><td>4,5</td><td>5</td></tr><tr><td>y_i:</td><td>1,25</td><td>1,4</td><td>1,5</td><td>1,75</td><td>2,25</td></tr></table>	x_i :	1	1,5	3	4,5	5	y_i :	1,25	1,4	1,5	1,75	2,25
$\begin{matrix} X \\ Y \end{matrix}$	10	20	30	n_y																																							
15	4	28	6	38																																							
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n_x	10	28	12	$n = 50$																																							
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x_i :	1	1,5	3	4,5	5																																						
y_i :	1,25	1,4	1,5	1,75	2,25																																						