28-mavzu. Tanlanmaning yig'ma xarakteristikalarini hisoblash usullari

1. Shartli variantalarni tuzish

2. Tanlanam o'rta qiymat va tanlanma dispersiyani ko'paytmalar usulida hisoblash

3. Normal egri chiziqni tajriba ma'lumotlari bo'yicha yasash

1. Shartli variantalarni tuzish

1-misol. Qiyidagi statistic taqsimotning shartli variantalarini toping:

x_i	23,6	28,6	33,6	38,6	43,6
n_i	5	20	50	15	10

Yechish. Soxta nol sifatida 38,6 variantani olamiz, h=28,6-23,6=5.

Shartli variantani topamiz:

$$u_1 = \frac{x_1 - C}{h} = \frac{23{,}6 - 38{,}6}{5} = -2.$$

Shunga o'xshash qolgan variantalarni topamiz:

$$u_2 = -1,\ u_3 = 0,\ u_4 = 1,\ u_5 = 2.$$

u_i	-2	-1	0	1	2
n_i	5	20	50	15	10

2-misol. Janubiy Irlandiyada 21 ta fermasida 2009-2011 yillar davomida yog'in miqdori o'rganilganda quyidagi natija olingan (mm/yil):

1027 1124 1124 1373 1373 1373 1077 1373 1077 1373 1373 1373 1077 1124 1124 1453 1077 1124 1124 1373 1373[1]

a) Tanlanmaning statistic taqsimotini tuzing;

b) Tuzilgan taqsimot asosida shartli variantalar bo'yicha taqsimot tuzing.

3-misol. Janubiy Irlandiyada 21 ta fermasida 2009-2011 yillar davomida sigirlardan o'rtacha sog'ib oligan sut miqdori o'rganilganda quyidagi natija olingan (litr/bosh):

[1] E.Mihailescu, P.N.C.Murphy, W.Ryan , I.A.Casey and J. Humphreys. Nitrogen balance and use efficiency on twenty-one intensive grass-based dairy farms in the South of Ireland (*Journal of Agricultural Science* (2014), 152, 843–859.)

5319 6010 5688 5309 5149 5672 5080 5671 5431 2507 4229 5613 5290 4415 4671 6038 4928 5549 5500 5174 5522[2]

a) Tanlanmaning statistic taqsimotini tuzing;

b) Tuzilgan taqsimot asosida shartli variantalar bo'yicha taqsimot tuzing.

4-misol. Ma'lum bir hududdagi 4 ta chorvachilik fermasida 30 tadan sigirlarning laktasiya davrida o'rtacha sog'ib olinadigan sut miqdori o'rganilib, quyidagi taqsimot tuzilgan:

x_i	3245	3250	3400	3450	3500	3550
n_i	28	22	45	13	8	4

a) Tanlanmaning statistic taqsimotini tuzing;

b) Tuzilgan taqsimot asosida shartli variantalar bo'yicha taqsimot tuzing.

6.2. Tanlanam o'rta qiymat va tanlanma dispersiyani ko'paytmalar usulida hisoblash

5-misol. Ko'paytmalar usulidan foydalanib quyidagi statistic taqsimotning tanlanma o'rtacha qiymatini va tanlanma dispersiyasini toping:

x_i	10,2	10,4	10,6	10,8	11,0	11,2	11,4	11,6	11,8	12,0
n_i	2	3	8	13	25	20	12	10	6	1

Yechish. tanlanma hajmi n=100, qadam $h=0,2$, soxta nol $C=11,0$. Ko'paytmalar jadvalini tuzamiz:

x_i	n_i	u_i	$u_i n_i$	$n_i u_i^2$	$n_i(u_i+1)^2$
10,2	2	-4	-8	32	18
10,4	3	-3	-9	27	12
10,6	8	-2	-16	32	8
10,8	13	-1	-13	13	0
11,0	25	0	0	0	25
11,2	20	1	20	20	80
11,4	12	2	24	48	108

[2] E.Mihailescu, P.N.C.Murphy, W.Ryan , I.A.Casey and J. Humphreys. Nitrogen balance and use efficiency on twenty-one intensive grass-based dairy farms in the South of Ireland (*Journal of Agricultural Science* (2014), 152, 843–859.)

11,6	10	3	30	90	160
11,8	6	4	24	96	150
12,0	1	5	5	25	36
	n=100		$\sum n_i u_i = 57$	$\sum n_i u_i^2 = 383$	$\sum n_i (u_i + 1)^2 = 597$

Tekshirish:

$$\sum n_i u_i^2 + 2\sum n_i u_i + n = 383 + 2 \cdot 57 + 100 = 597,$$
$$\sum n_i (u_i + 1)^2 = 597.$$

Demak hisoblash to'g'ri bajarilgan.

Birinchi va ikkinchi tartibli shartli momentlarni hisoblaymiz:

$$M_1^* = \frac{\sum n_i u_i}{n} = \frac{57}{100} = 0{,}57, \quad M_2^* = \frac{\sum n_i u_i^2}{n} = \frac{383}{100} = 3{,}83.$$

Bularga asosan, tanlanma o'rtacha qiymat va tanlanma dispersiyani hisoblaymiz:

$$\bar{x}_t = M_1^* h + c = 0{,}57 \cdot 0{,}2 + 11{,}0 = 11{,}1,$$

$$V_t = \left[M_2^* - \left(M_1^*\right)^2\right] \cdot h^2 = \left(3{,}83 - (0{,}57)^2\right) \cdot 0{,}2^2 = 0{,}14.$$

6-misol. Ko'paytmalar usulidan foydalanib quyidagi statistic taqsimotning tanlanma o'rtacha qiymatini va tanlanma dispersiyasini toping:

x_i	0,05	0,1	0.15	0,2	0,25	0,3	0,35	0,4	0,45	0,5
n_i	1	2	4	6	12	10	6	5	3	1

7-misol. Ko'paytmalar usulidan foydalanib quyidagi statistic taqsimotning tanlanma o'rtacha qiymatini va tanlanma dispersiyasini toping:

x_i	122,4	128,4	132,4	136,4	140,4	144,4	148,4	152,4
n_i	2	5	8	18	25	20	12	10

8-misol. Ko'paytmalar usulidan foydalanib quyidagi statistic taqsimotning tanlanma o'rtacha qiymatini va tanlanma dispersiyasini toping:

x_i	10,2	10,4	10,6	10,8	11,0	11,2	11,4	11,6	11,8
n_i	3	4	6	11	20	26	14	8	8

9-misol. Ko'paytmalar usulidan foydalanib quyidagi statistic taqsimotning tanlanma o'rtacha qiymatini va tanlanma dispersiyasini toping:

x_i	25,38	29,82	34,26	38,7	43,14	47,58	52,02	56,46	60,9	65,34
n_i	6	12	11	14	22	18	15	7	3	2

6.3. Normal egri chiziqni tajriba ma’lumotlari bo’yicha yasash