Exercise 7.2

The number of telephone calls received at an exchange per interval for 250 successive one- minute intervals are given in the following frequency table:

No. of calls (x):	**0**	**1**	**2**	**3**	**4**	**5**	**6**
No. of intervals (f):	**15**	**24**	**29**	**46**	**54**	**43**	**39**

Compute the mean number of calls per interval.

Solution:

Let the assumed mean(A) = 3

No. of calls x_i	No. of intervals f_i	$u_i = x_i - A = x_i - 3$	$f_i u_i$
0	15	-3	-45
1	24	-2	-48
2	29	-1	-29
3	46	0	0
4	54	1	54
5	43	2	86
6	39	3	117
	N = 250		$\Sigma f_i x_i = 135$

Mean number of calls = $A + \Sigma f_i x_i / N$
$= 3 + 135/250$
$= (750 + 135)/ 250 = 885/ 250$
$= 3.54$

1. Five coins were simultaneously tossed 1000 times, and at each toss the number of heads was observed. The number of tosses during which 0, 1, 2, 3, 4 and 5 heads were obtained are shown in the table below. Find the mean number of heads per toss.

No. of heads per toss (x):	**0**	**1**	**2**	**3**	**4**	**5**
No. of tosses (f):	**38**	**144**	**342**	**287**	**164**	**25**

Solution:

Let the assumed mean(A) = 2

No. of heads per toss x_i	No of intervals f_i	$u_i = x_i - A = x_i - 2$	$f_i u_i$
0	38	-2	-76
1	144	-1	-144

2	342	0	0
3	287	1	287
4	164	2	328
5	25	3	75
	N = 1000		$\Sigma f_i x_i = 470$

Mean number of heads per toss = $A + \Sigma f_i x_i / N$
$= 2 + 470/1000$
$= 2 + 0.470$
$= 2.470$

2. The following table gives the number of branches and number of plants in the garden of a school.

No of branches (x):	**2**	**3**	**4**	**5**	**6**
No of plants (f):	**49**	**43**	**57**	**38**	**13**

Calculate the average number of branches per plant.

Solution:

Let the assumed mean (A) = 4

No of branches xi	No of plants f_i	$u_i = x_i - A = x_i - 4$	$f_i u_i$
2	49	-2	-98
3	43	-1	-43
4	57	0	0
5	38	1	38
6	13	2	26
	N = 200		$\Sigma f_i x_i = -77$

Average number of branches per plant = $A + \Sigma f_i x_i / N = 4 + (-77/200)$
$= 4 - 77/200$
$= (800 - 77)/200$
$= 3.615$

3. The following table gives the number of children of 150 families in a village

No of children (x):	**0**	**1**	**2**	**3**	**4**	**5**
No of families (f):	**10**	**21**	**55**	**42**	**15**	**7**

Find the average number of children per family.

Solution:

Let the assumed mean (A) = 2

No of children x_i	No of families f_i	$u_i = x_i - A = x_i - 2$	$f_i u_i$
0	10	-2	-20
1	21	-1	-21
2	55	0	0
3	42	1	42
4	15	2	30
5	7	3	21
	N = 150		$\Sigma f_i x_i = 52$

Average number of children for family = $A + \Sigma f_i x_i / N = 2 + 52/150$
$= (300 + 52)/150$
$= 352/150$
$= 2.35$ (corrected to neat decimal)

mc24 Myclass24 Your Class. Your Pace.