Frequency distribution :-

A frequency distribution is a set of mutually exclusive classes or categories together with the frequency of occurance of items, values or observations in each class or category in a given set of data, presented usually in a tabular form.

Explanation :- Frequency distribution এর কোন tabular form এ থাকে কতগুলো Class or categories. আমরা কতকগুলো জিনিসকে নির্দিষ্ট Class এ ভাগ করব। আর কোন class এ কোন সংখ্যা / জিনিস কতবার পড়ছে তা দেখব। কতবার পড়ছে তাই এর frequency.

Example দেখলেই clear হয়ে যাবে।

Summarizing & Presenting Data

Frequency Distribution:

Suppose a survey was conducted among 20 workers of Beximco pharmaceutical company (BPC).
Raw data on background characteristicks of workers:

Worker	wage	Age	Smoking status	Health status
1	92	27	Smoker	Bad
2	67	22	Non-smoker	Bad
3	92	24	Smoker	Average
4	68	34	Smoker	Good
5	87	28	Non-smoker	Good
6	74	19	Smoker	Average
7	50	26	Smoker	Average
8	76	37	Non-smoker	Average
9	86	22	Smoker	Bad
10	97	26	Non-smoker	Bad
11	51	24	Non-smoker	Average
12	74	29	Smoker	Average
13	68	34	Smoker	Average
14	65	25	Smoker	Bad
15	92	35	Non-smoker	Bad
16	96	24	Non-smoker	Good
17	77	27	Smoker	Bad
18	87	28	Non-smoker	Bad
19	86	28	Non-smoker	Bad
20	90	22	Smoker	Good

wage - মুঝুরি

Frequency distribution for categorical data!

Table 1: Smoking status of BPC workers

Smoking status	Number of workers
Smoker	11
Non-Smoker	9
Total	20

Table-2: Health status of BPC workers

Health Status	Number of workers
Good	4
Average	7
Bad	9
Total	20

Table-3 Health and smoking status together

Smoking Status \ Health Status	Good	Average	Bad	total
Smoker	3	5	3	11
Non-Smoker	1	2	6	9
Total	4	7	9	20

Frequency Distribution for Numerical Data:

Numerical এর Quantitative data এর

Frequency Distribution for numerical data:-

Before constructing frequency distribution for numerical data we have to know some definitions.

Class: A class is an interval containing observations, each observation being classified into one and only one class. কোন observation যেন কোন class এর একটি থাকে

Frequency: Frequencies are the number of observations or values falling into each class. প্রত্যেক class এ বভুসংখ্যা সংখ্যা বা observation এর

Class width: The difference between two class limits is the class width.

5 - 10
11 - 16

5 হতে 10 এর একটি class এর class limits.
5 হল বভুর lower limit
10 হল বভুর upper limit

class width এর 10 - 5 = 5.

Now let us construct frequency distribution fore numerical data :-

Consider the data you are given. we have 20 data entries fore the BPC workers. The variables wage and age are of numerical/quantitative type.

Fore at first we will construct frequency distribution fore <u>age</u> :-

we have to determine the number of classes first.

There is a rule to find the number of classes which is known as '2 to the k rule'. If $2^k \geqslant N$ fore the first time then the number of classes should be k where N is the total number of observations. fore the current situation of BPC worker data N = 20. At first we have to consider k=1, then $2^1 = 2 < 20$ so k=1 should not be taken. Then consider k=2, $2^2 = 4 < 20$

∴ $2^4 = 16 < 20$. So, $1, 2, 3, 4$ should not be the value of K. $2^5 = 32$ which is greater than 20 for the first time.

So $K = 5 =$ number of class.

Then we have to find class width.

class width $= \dfrac{\text{Maximum value} - \text{minimum value}}{\text{Number of class}}$

$= \dfrac{37 - 19}{5} = 3.6 \approx 4$

Frequency distribution for age:-

Class limit	Tally	Frequency
19 - 22	IIII	4
23 - 26	IIII I	6
27 - 30	IIII I	6
31 - 34	II	2
35 - 38	II	2

{ Class width Gunā 4.
upper limit — Lower limit + 1.

Construct Frequency Distribution for wage :-

Here, $n = 20$

So number class $= 5$

Class width $= \dfrac{Maximum - minimum}{5}$

$$= \dfrac{97 - 50}{5} = 9.4 \approx 10$$

Class limit	Tally	Frequency
50-59	II	2
60-69	IIII	4
70-79	IIII	4
80-89	IIII	4
90-99	IIII I	6

পরিসংখ্যা অনুসারে wage এর জন্য শ্রেণীকে করলাম

ত্তর্পুর নিয়মরই হল।

Age এর জন্য details নিম্নরূপ তৈরার জন্য

Table 2.1: Raw data on background characteristics of workers

Worker	Wage	Age	Religion	Days absent	Family size	Education
1	93	25	Muslim	26	Small	Higher
2	66	29	Muslim	16	Large	None
3	93	32	Hindu	14	Small	Primary
4	69	39	Muslim	18	Medium	Primary
5	88	43	Christian	27	Large	Higher
6	76	40	Muslim	29	Medium	None
7	50	46	Muslim	23	Large	None
8	75	45	Muslim	33	Small	Higher
9	86	51	Christian	17	Large	Primary
10	95	37	Muslim	24	Medium	None
11	51	38	Muslim	17	Large	Primary
12	74	42	Muslim	18	Small	Primary
13	68	46	Muslim	21	Large	Higher
14	65	28	Muslim	11	Medium	Higher
15	89	30	Muslim	10	Medium	Primary
16	88	32	Muslim	12	Medium	Higher
17	77	36	Muslim	13	Large	None
18	87	37	Muslim	18	Large	Primary
19	85	41	Christian	'15	Medium	Primary
20	84	35	Hindu	16	Medium	Higher
21	82	43	Muslim	22	Medium	Primary
22	83	44	Muslim	14	Small	Higher
23	82	42	Hindu	15	Small	Primary
24	81	42	Hindu	8	Medium	Higher
25	79	44	Muslim	9	Medium	Primary
26	80	47	Muslim	17	Small	Primary
27	65	46	Muslim	15	Large	None
28	74	36	Muslim	14	Small	None
29	69	37	Muslim	10	Medium	Higher
30	54	43	Muslim	11	Large	Primary
31	56	42	Muslim	10	Medium	None
32	73	45	Muslim	13	Large	Higher
33	75	34	Muslim	12	Medium	Primary
34	74	33	Muslim	17	Large	Higher
35	72	37	Christian	16	Medium	Primary
36	72	35	Muslim	20	Large	Primary
37	70	33	Hindu	19	Medium	None
38	63	36	Muslim	10	Large	Higher
39	70	38	Muslim	5	Medium	Higher
40	68	52	Muslim	12	Medium	Higher
41	59	54	Hindu	16	Medium	None
42	67	31	Muslim	18	Large	Primary
43	61	35	Hindu	21	Large	Higher
44	60	46	Muslim	19	Medium	Higher
45	56	44	Hindu	19	Medium	Primary
46	62	33	Muslim	15	Medium	Higher
47	72	36	Muslim	9	Small	Higher
48	73	38	Muslim	13	Small	Primary
49	71	32	Hindu	19	Medium	Higher
50	57	50	Christian	18	Medium	None