**FREQUENCY AND CUMULATIVE DISTRIBUTION**

**Frequency distribution**

Frequency is the number of times the data occur in an experiment. A frequency distribution table is an arrangement of the values that one or more variables take in a sample. It is a tabular arrangement of a given collection of data by class together with the corresponding class frequencies. Each entry in a table contains the frequency or count of the occurrence of values within a particular group or interval.

Example 1

Construct a frequency table for the following data: 6,0,4,3,7,5,2,4,0,2,6,7,6,7,1,0,4,6,7,7,8,6,3,1,3,6

Solution

|  |  |  |
| --- | --- | --- |
| S/N | DATA | FREQUENCY |
| I | 0 | 3 |
| 2 | 1 | 2 |
| 3 | 2 | 2 |
| 4 | 3 | 3 |
| 5 | 4 | 3 |
| 6 | 5 | 1 |
| 7 | 6 | 6 |
| 8 | 7 | 5 |
| 9 | 8 | 1 |

Example 2

The following are raw data of the number of children in family of 47 staff 1,1,3,2,0,2,0,1,2,2,1,3,5,2,4,0,0,2,4,1,1,2,2,0,3,0,0,2,1,3,6,0,2,1,0,3,2,2,2,1,0,0,1,1,3,1,4. Summarize the data into frequency distribution.

Solution

|  |  |  |
| --- | --- | --- |
| S/N | DATA | FREQUENCY |
| 1 | 0 | 12 |
| 2 | 1 | 12 |
| 3 | 2 | 13 |
| 4 | 3 | 6 |
| 5 | 4 | 3 |
| 6 | 5 | 1 |

PROCEDURES FOR CONSTRUCTING A GROUP FREQUENCY DISTRIBUTION

1. Determine the number of groups and width of the class. The number of class is usually between 3 and 20.
2. Obtain a class limit for each class.
3. Determine the number of observation falling into each class interval.
4. Count the number of each class and record the frequency

Example3

The following scores represent the final examination grade for 60 randomly selected students who offer STA111 in year 2020. 23, 60, 79, 32, 57, 74, 52, 70, 82, 36, 80, 77, 81, 95, 41, 65, 92, 85, 55, 76, 52, 10, 64, 75, 78, 25, 80, 98, 81, 67, 41, 71, 83, 54, 64, 72, 88, 62, 74, 43, 60, 78, 89, 76, 84, 48, 84, 90, 15, 79, 34, 67, 17, 82, 69, 74, 63, 80, 85 and 61. Using 10 classes with the lowest starting at 9, set up a frequency table.

Solution

The highest value is 98 while the lowest is based on the question is 9.

The number of classes is also given in the question which is 10

Obtain class limit = (98 – 9)/10 = 8.9 / 9

|  |  |  |
| --- | --- | --- |
| S/N | CLASS INTERVAL | FREQUENCY |
| 1 | 9 – 17 | 3 |
| 2 | 18 – 26 | 2 |
| 3 | 27 – 35 | 2 |
| 4 | 36 – 44 | 4 |
| 5 | 45 – 53 | 3 |
| 6 | 54 – 62 | 7 |
| 7 | 63 – 71 | 9 |
| 8 | 72 – 80 | 15 |
| 9 | 81 – 89 | 11 |
| 10 | 90 – 98 | 4 |

**CUMMULATIVE FREQUENCY**

This is obtained by successively adding together the frequency.

From the example 1 above

|  |  |  |  |
| --- | --- | --- | --- |
| S/N | DATA | FREQUENCY | CUMMULATIVE FREQUENCY |
| I | 0 | 3 | 3 |
| 2 | 1 | 2 | 3+2=5 |
| 3 | 2 | 2 | 5+2=7 |
| 4 | 3 | 3 | 7+3=10 |
| 5 | 4 | 3 | 10+3=13 |
| 6 | 5 | 1 | 13+1=14 |
| 7 | 6 | 6 | 14+6=20 |
| 8 | 7 | 5 | 20+5=25 |
| 9 | 8 | 1 | 25+1=26 |

From example 2 above

|  |  |  |  |
| --- | --- | --- | --- |
| S/N | DATA | FREQUENCY | CUMMULATIVE FREQUENCY |
| 1 | 0 | 12 | 12 |
| 2 | 1 | 12 | 12+12=24 |
| 3 | 2 | 13 | 24+13=37 |
| 4 | 3 | 6 | 37+6=43 |
| 5 | 4 | 3 | 43+3=46 |
| 6 | 5 | 1 | 46+1=47 |

From example 3 above

|  |  |  |  |
| --- | --- | --- | --- |
| S/N | CLASS INTERVAL | FREQUENCY | CUMMULATIVE FREQUENCY |
| 1 | 9 - 17 | 3 | 3 |
| 2 | 18 - 26 | 2 | 3+2=5 |
| 3 | 27 – 35 | 2 | 5+2=7 |
| 4 | 36 – 44 | 4 | 7+4=11 |
| 5 | 45 – 53 | 3 | 11+3=14 |
| 6 | 54 – 62 | 7 | 14+7=21 |
| 7 | 63 – 71 | 9 | 21+9=30 |
| 8 | 72 – 80 | 15 | 30+15=45 |
| 9 | 81 – 89 | 11 | 45+11=56 |
| 10 | 90 - 98 | 4 | 56+4=60 |

Cumulative frequency curve (O-give curve) is a graph of the cumulative frequency cummulation of any set of data. It is obtained by plotting the cumulative frequency against the corresponding upper class boundaries and joining all the consecutive point. An additional point is obtained by plotting a frequency of zero against the lowest lower class boundaries.