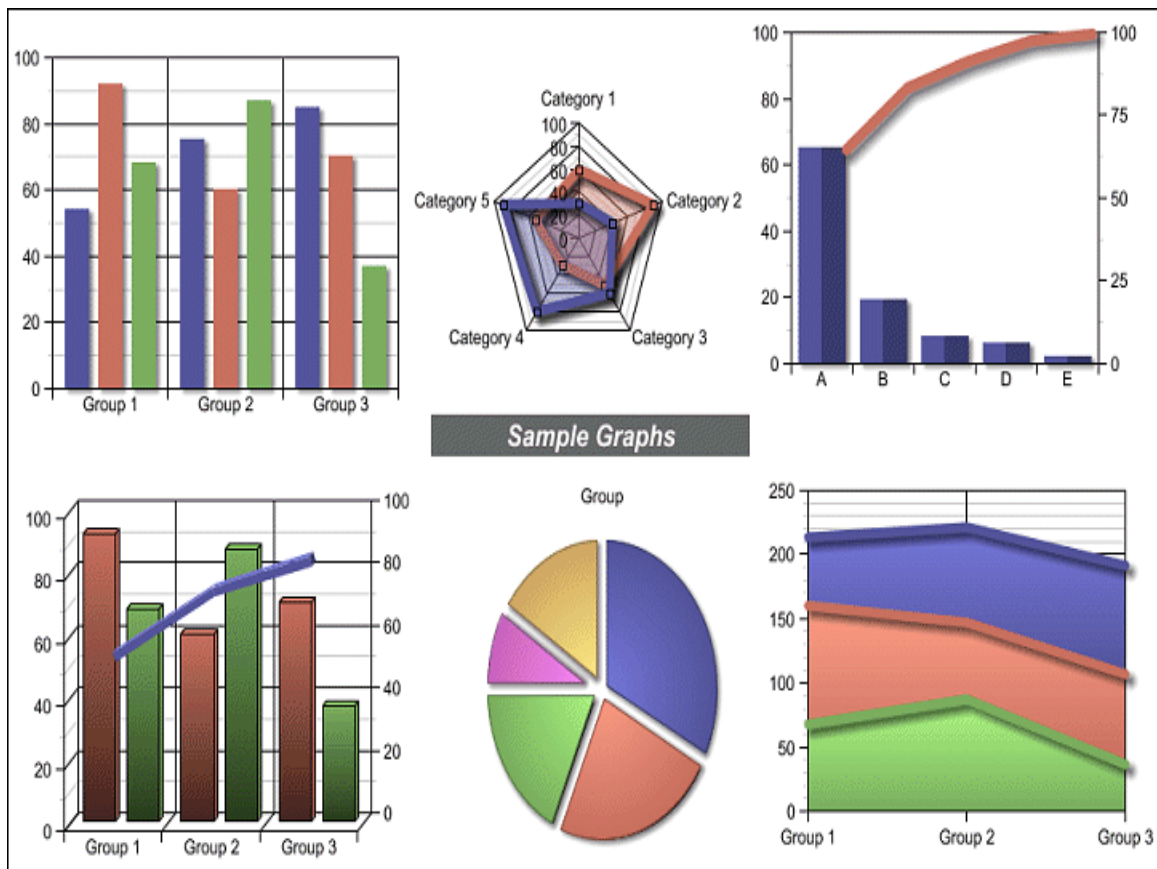


Meteorological statistic

for 4th stage undergraduate

lecturer

Assist. prof.dr. Asraa Khtan



Statistic: A branch of mathematics dealing with the collection, classification, presentation and analysis of data. The two major types of statistics are descriptive statistics and inferential statistics.

Descriptive statistics: the branch of statistics devoted to the summarization, organization and description of data. It includes the construction of graphs, charts and tables. Descriptive statistics measures (measures of central tendency, measures of dispersion and variability and percentiles).

Inferential statistics: the branch of statistics concerned with using sample data to make an inference about a population of data. It includes methods like point estimation, interval estimation and hypothesis testing which are all based on probability theory.

There are many applications of statistics in all branches of science meteorological one of them.

Basic statistical terms

Variable: is any characteristic, number or quantity that can be measured or counted. So variables can be classified as :

Population is any specific collection of objects of interest.

Sample is any subset or sub collection of the population, including the case that the sample consists of the whole population.

Data is the most basic element in statistics consists of observations, variables and data values.

Types of variables

there are different ways variables can be described according to the ways they can be studied, measured and presented. So variables can be classified as :

Qualitative: the data collected for categorical variable where use words like names and labels, example: Baghdad station.

Quantitative: the data collected for a numeric variable where use numbers , example: temperature is 23^oc.

Potential: use name and number for example: temperature of Baghdad station is very high is 50 ^oc.

******data in atmospheric science is observation from device like temperature or measurement from equation like evaporation.**

Data presentation

after data collection is important to display the in an easy and understandable which appropriate to the size and type of data. There is more than one way

a-Tables

A way to summarize data in different way, frequency tables one of them. for example the table below.

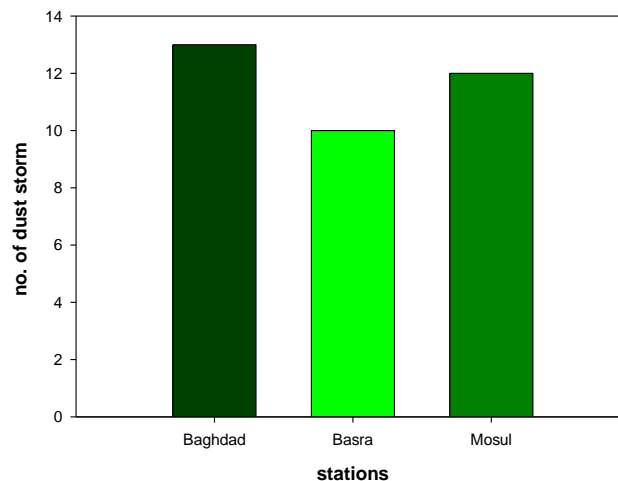
Table of No. of dust storm for three stations

Stations	No. of dust storm
Baghdad	13
Basra	10
Mosul	12

******must put title of table above it**

b- Diagram

Representation data by using graphical way .there are many types of diagram like (histogram, line polygon----) .for example the diagram below.



No. of dust storm for three stations

******must put title of diagram down it**

c- Pie Charts

is a circular graph divided into sectors, each sector shows the relative size of each value. we must estimate percent and sector where

Percent is divide each value by the total and multiply by 100%

$$\text{percent} = (\text{value}/\text{total}) * 100\%$$

Sector is divide each value by the total and multiply by 360

$$\text{Sector} = (\text{value}/\text{total}) * 360$$

*******all percent equal 100 and all sector equal 360.**

example: if the total amount of precipitation (400mm) for the station Sulaymaniyah (120mm) of them in the form of hail and (60mm) snow and (220mm) rain, use pie chart to show precipitation.

$$\text{percent} = (\text{value}/\text{total}) * 100\%$$

$$p\% \text{ hail} = (120/400) * 100\% = 30\%$$

$$p\% \text{ snow} = (60/400) * 100\% = 15\%$$

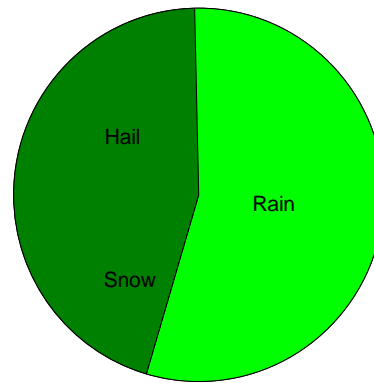
$$p\% \text{ rain} = (220/400) * 100\% = 55\%$$

$$\text{Sector} = (\text{value}/\text{total}) * 360$$

$$\text{Sector hail} = (120/400) * 360 = 108^\circ$$

$$\text{Sector snow} = (60/400) * 360 = 54^\circ$$

$$\text{Sector rain} = (220/400) * 360 = 198^\circ$$



*******in class room there are more examples in Data presentation and in the end of course you can take pdf for all examples with solution.**

Frequency table