

Classification and tabulation of statistical data

Definition: Classification is the process of arranging things in groups or classes according to their resemblances and affinities and gives expression to the unit of attributes that may subsist amongst a diversity of individuals.

Types of classifications

- Spatial /Geographical classification
- Chronological classification
- Qualitative classification
- Quantitative classification

Spatial /Geographical classification

In this type of classification data are classified on the basis of location or geographical difference.

Example1:- Coffee suppliers of the different regions of Ethiopia to the central government.

Example2:- The coffee exporters in the world.

Chronological classification

Chronological classification is a classification made on the basis of time. The standard classes under this classification are the standard scales like year, months, weeks, etc.

Example1:- The coffee export of Ethiopia for the last five years.

Example2:- Daytime students registered at HiLCoE since its establishment.

Qualitative classification

- Under qualitative classification data are classified on the basis of the differences in quality or kind.
- This classification separates data into classes on the bases of attributes or qualities such as sex, religion, marital status, nationality, etc.
- The qualities or attributes used under this classification should not be measurable.

Example1:- Classifying students by their department.

Example2:- Classifying workers by gender.

Quantitative classification

Quantitative classification refers to the classification of data according to some characteristics that can be measured or counted such as height, weight, number of class rooms in a compound/campus, test scores, number of students, etc. We divide quantitative classification in to two variables:

- Discrete variables
- Continuous variables

Frequency Distributions

Frequency Distributions are tabular representations of a quantitatively classified data. We divide Frequency Distributions into two measure groups:

- Ungrouped Frequency Distributions
- Grouped Frequency Distributions

Grouped Frequency Distribution

- **Definition:** A Grouped Frequency Distribution (GFD) is a table in which the values for a variable are grouped into classes together with the numbers of observed values falling into each class. The number of observed values that belong to class is called its *frequency*.

- Number of Classes
- Class Width
- Class Limits
- Class Boundaries
- Class Mark
- Frequency

– Many airline passengers seem weighted down with their luggage. Just how much weight are they carrying? The luggage weights for a random sample of 58 passengers arriving from Dubai were recorded to the nearest kilograms below:

-
- 87 74 43 52 57 76 45 56 53 53 85 42
- 64 41 53 34 63 68 54 92 22 67 47 41
- 77 38 42 54 37 56 45 59 59 79 32 60
- 30 75 53 66 66 66 65 68 60 43 35 18 64
- 57 34 78 47 60 20 59 58 43 26
-

- i) Construct a Grouped Frequency Distribution **using 7 classes.**
- ii} Draw a **frequency polygon** for the GFD you have constructed in (i).

- Rules for forming a GFD
- Graphs of a GFD
 - *Histogram*
 - *Frequency Polygon*

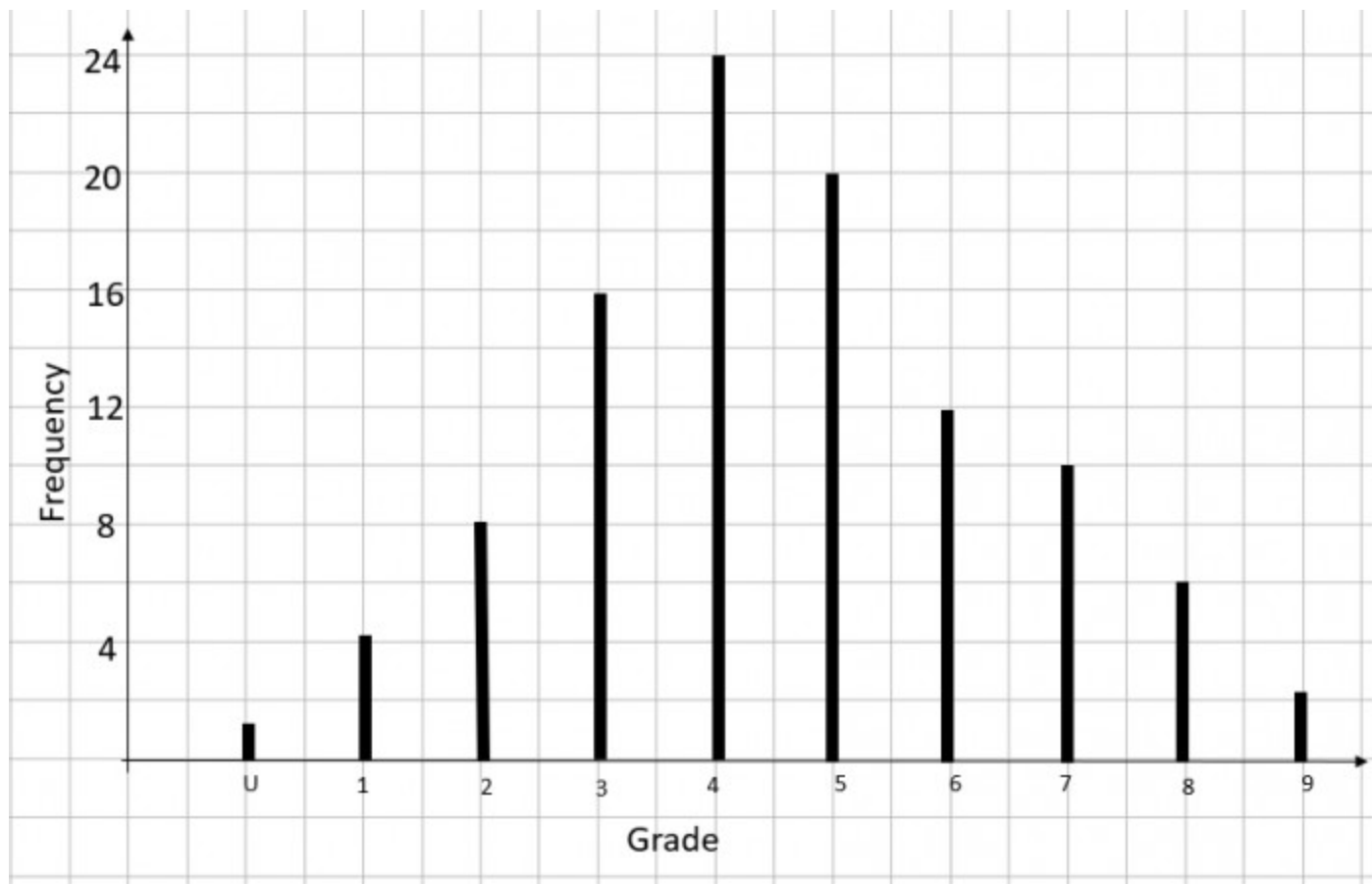
- Relative Frequency distribution (RFD)
- Cumulative Frequency Distribution (CFD)
- Relative Cumulative Frequency Distribution (RCFD)
- Ogives
- Percentage Ogives

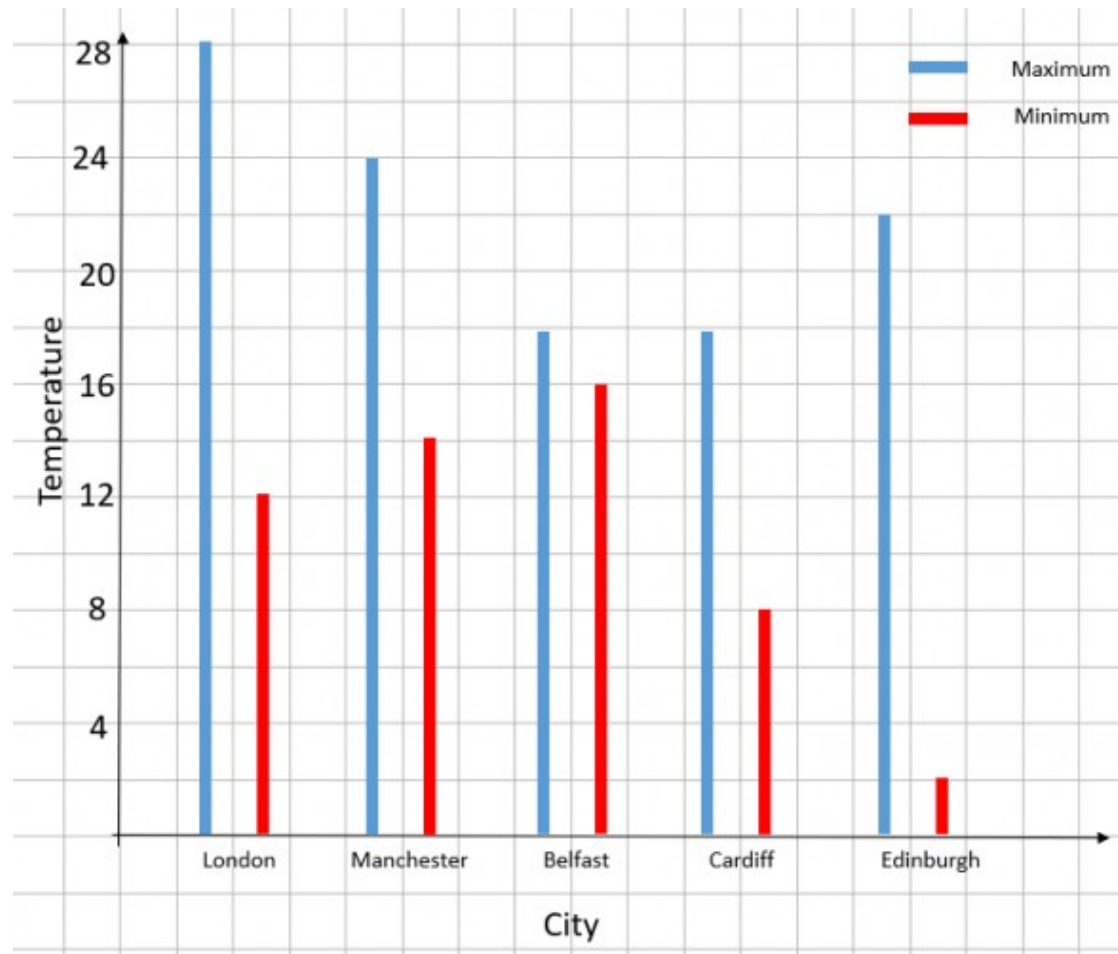
Graphs and Charts

Types of Graphs

1. Vertical line graph

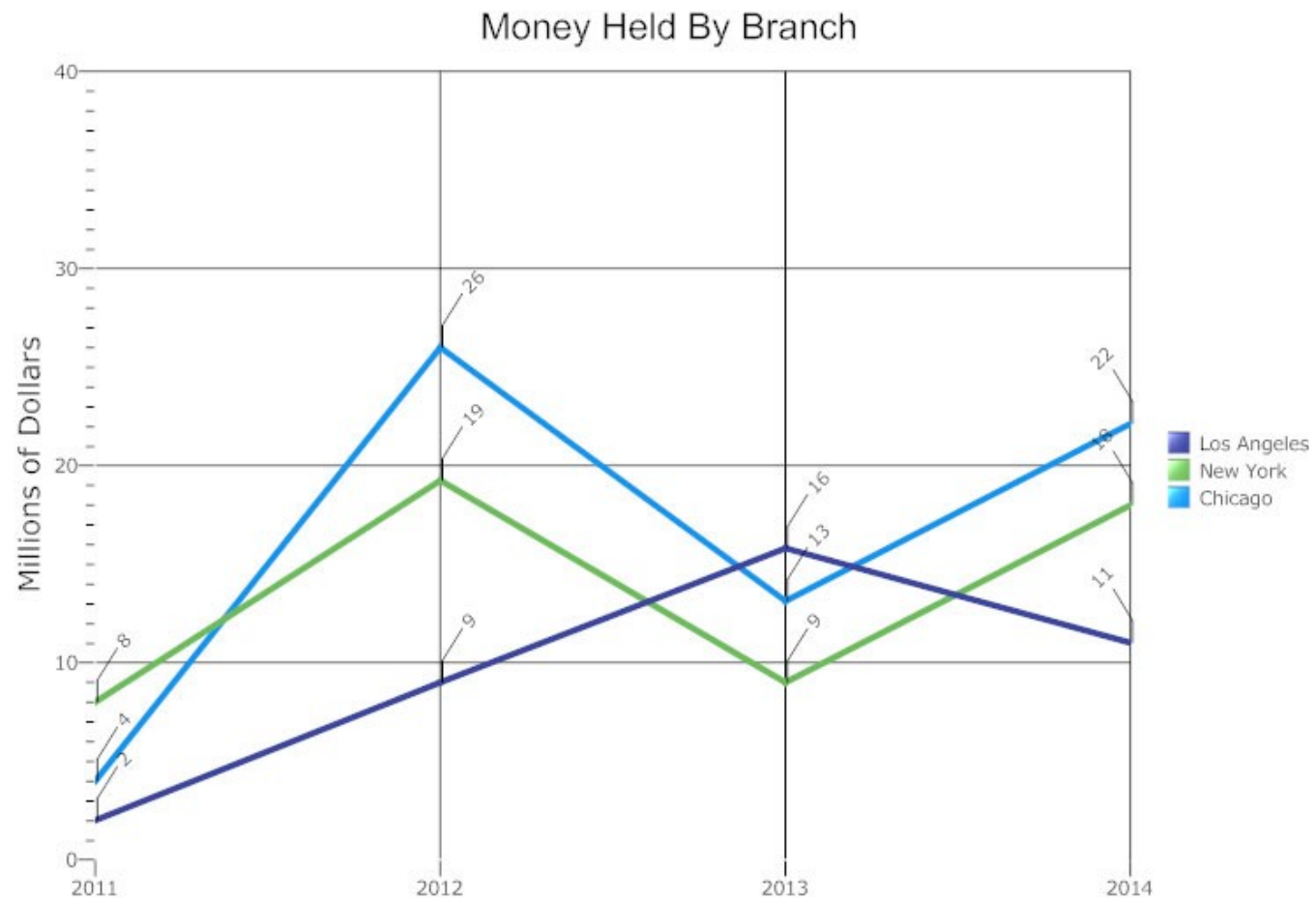
This is a graphical representation of discrete frequency distribution in which the height of the straight line represents the magnitude of a variables.

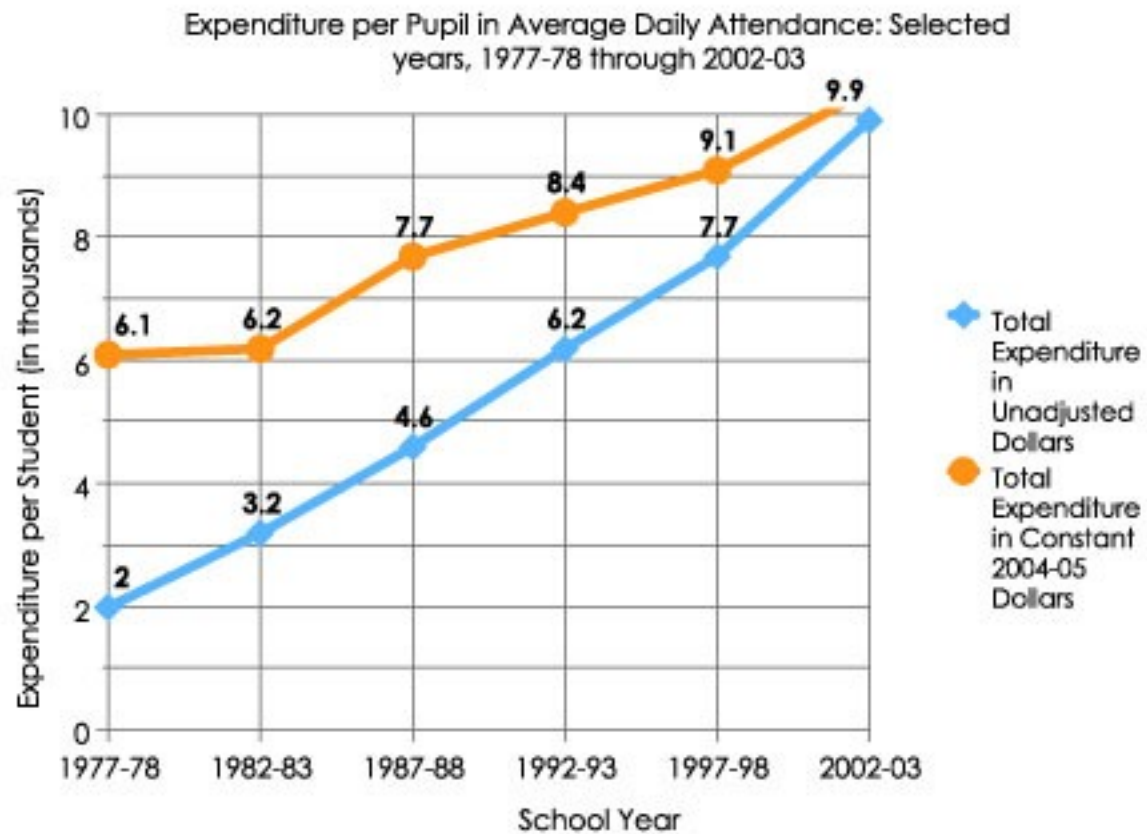




2. line graph

This is a graph, which represents the relationship between time (on the horizontal axis) and value of a variable (on the vertical axis). It shows the change of values of the variable through time.





The NCES Common Core of Data (CCD) 2004-2005

Charts

1. Bar Chart

A bar chart is a set of equally spaced bars where each bar is representing a certain category having height equal to the amount in that category.

Types of bar charts

1. Simple bar chart

A simple bar chart represents a single set of data classified in different categories.

A bar chart presents data in a manner similar to a histogram. The main difference is that the bar chart need not show frequencies on the axis, but may express the data in absolute amounts or even percentage.

Types of bar charts (Contd...)

Also, the bars may be presented:

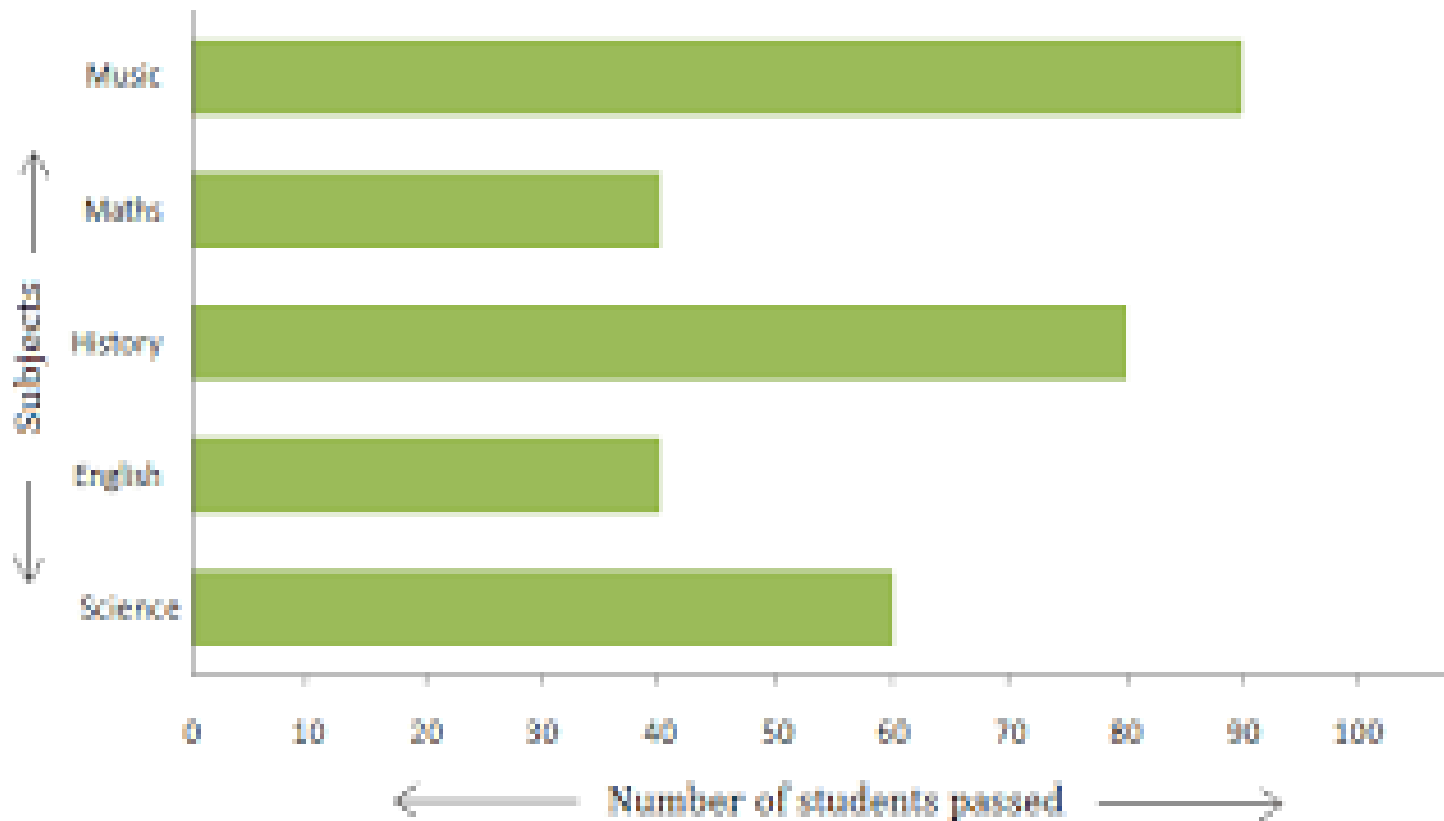
- Horizontally (usually used for qualitatively or geographically classified data)
- Vertically

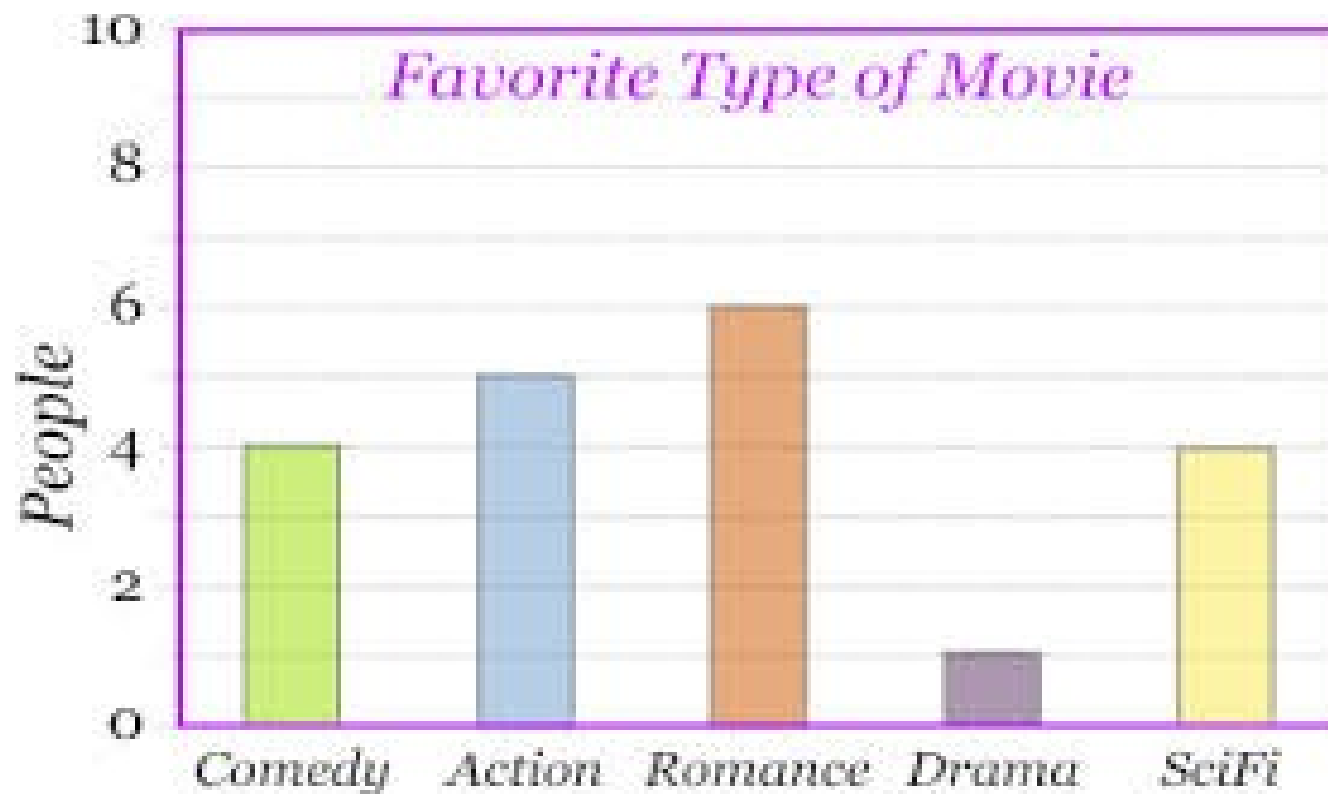
Example1:- The number of students passed in a certain test taken out of ten.

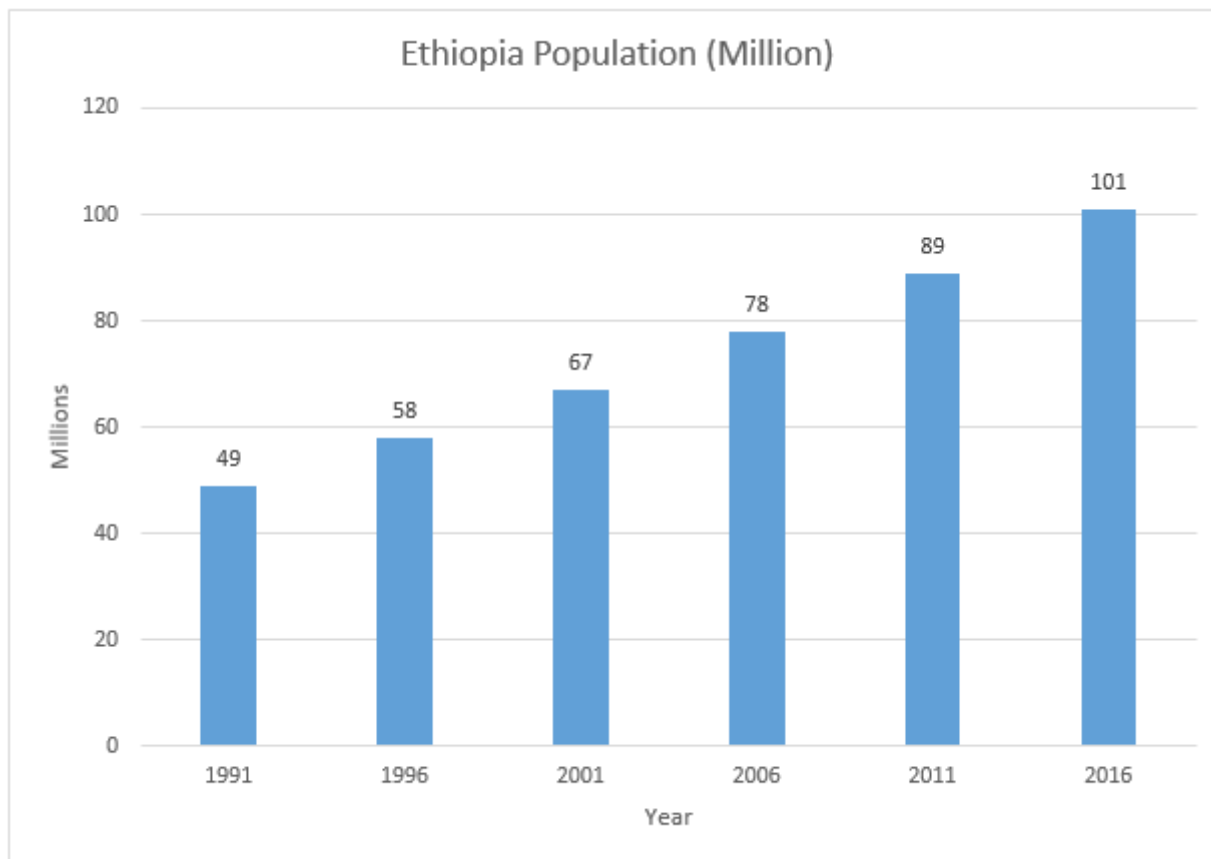
Example2:- Sample data collected to identify people's favorite movies.

Example2:- Population growth of Ethiopia in 25 years.

Horizontal bar graph presenting Number of students passed in different subjects







Types of bar charts (Contd...)

3. Multiple bar chart

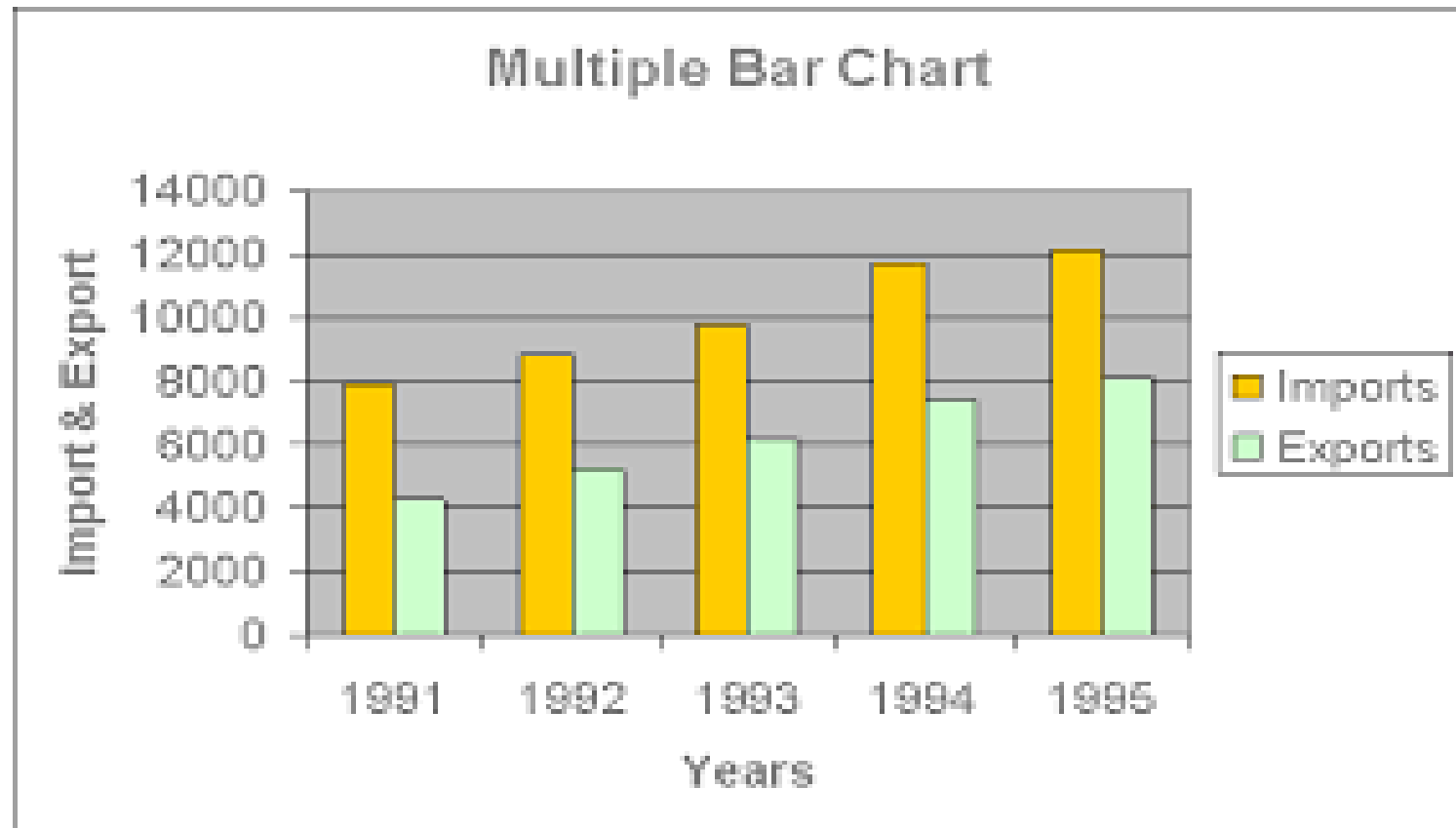
This is a bar chart where a group of bars represent two or more inter related data in each category.

Example 1:- *The import and export of a country for the last five years.*

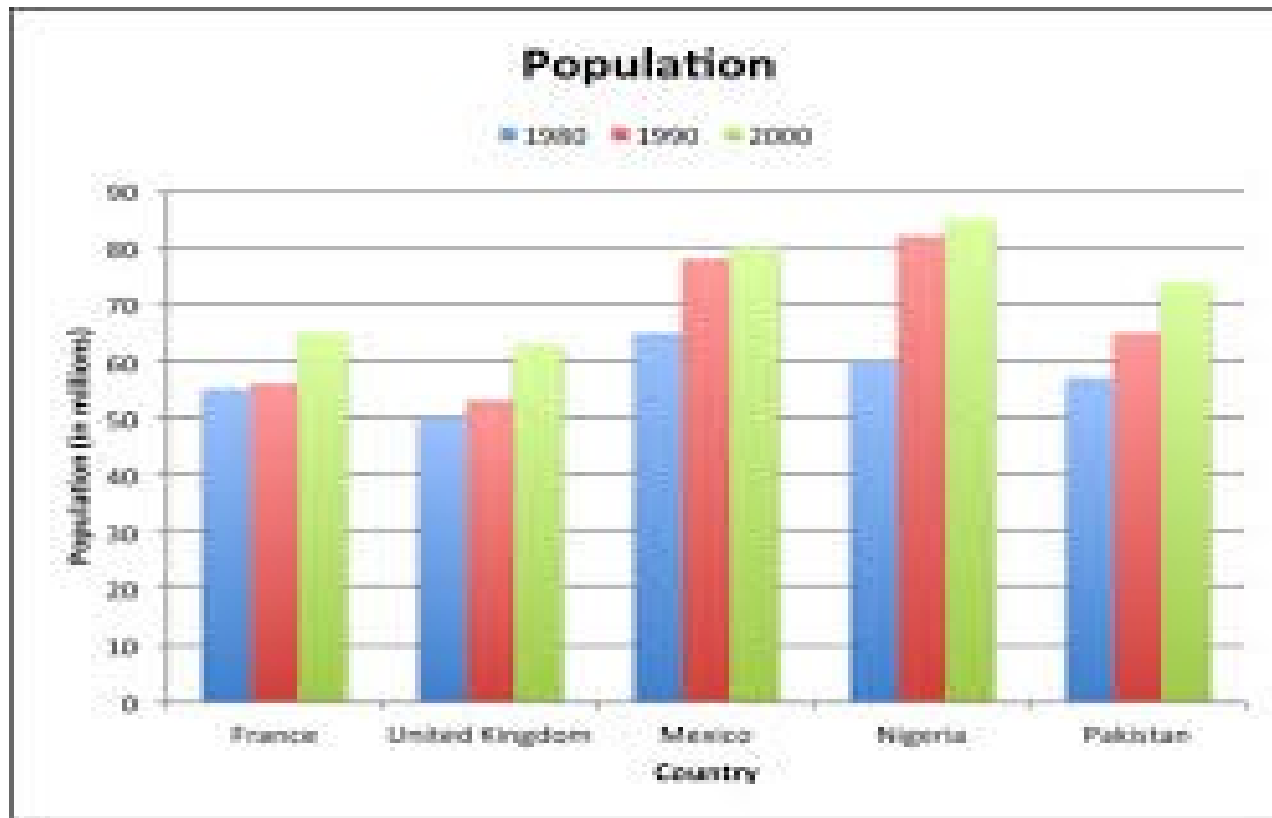
Example 2:- *the population growth of the sample of five countries.*

Example 2:- *The Import and export indicator of Ethiopia from 2011 to 2017.*

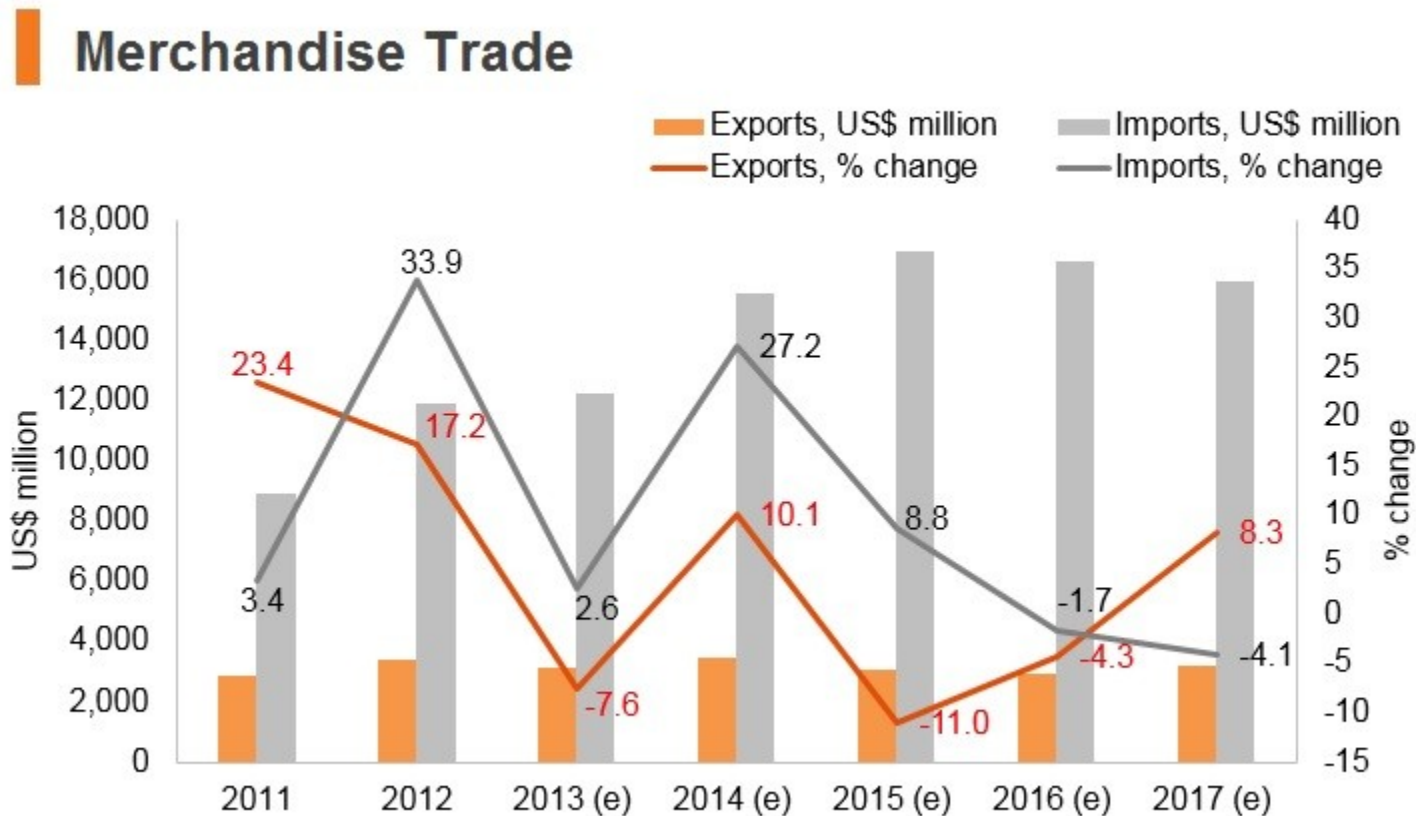
Multiple Bar Graph presenting the import and export of a country for five years



Multiple Bar Graph presenting the population growth of the sample of five countries



Import and export indicator of Ethiopia for seven years



Types of bar charts (Contd...)

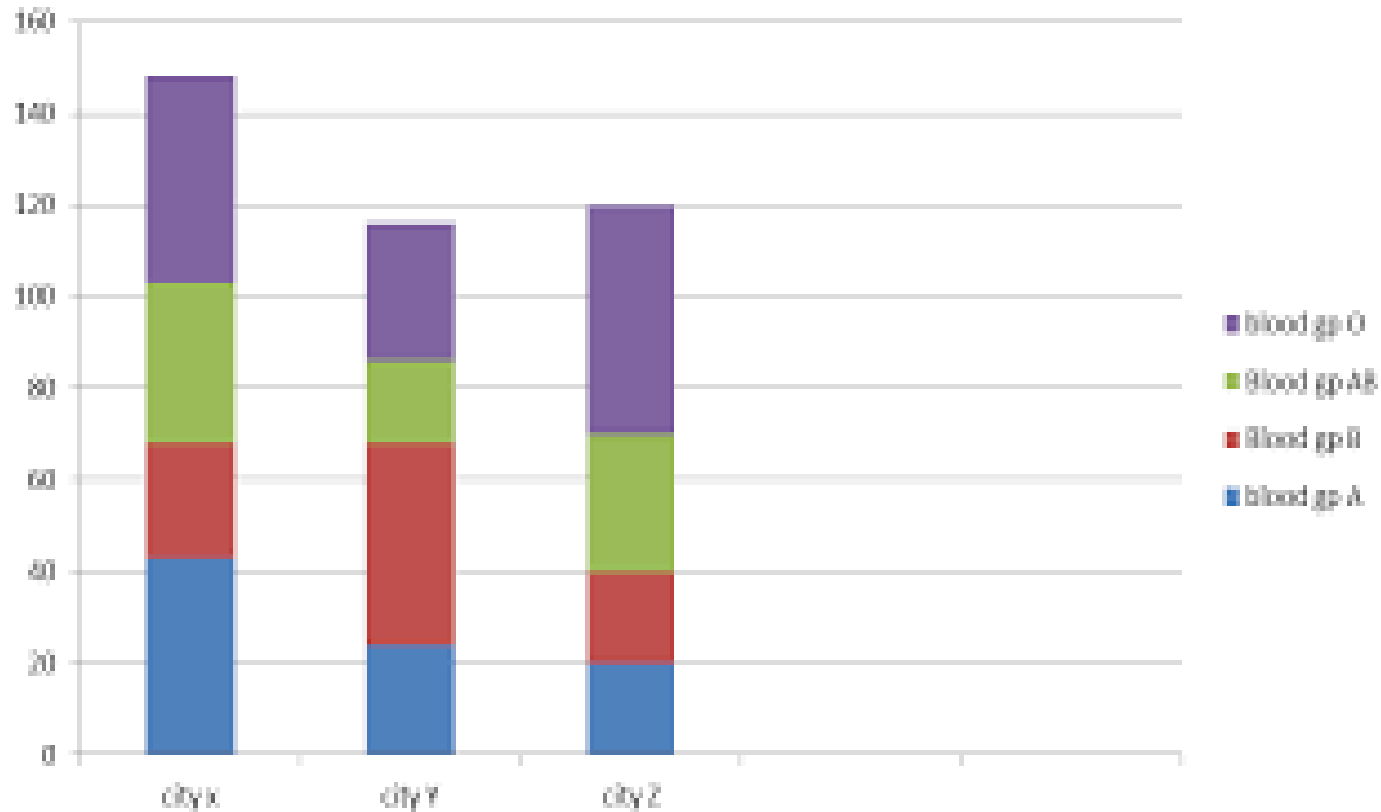
2. Subdivided (Component) bar chart

This is a diagram where each bar represents the cumulative of two or more categories.

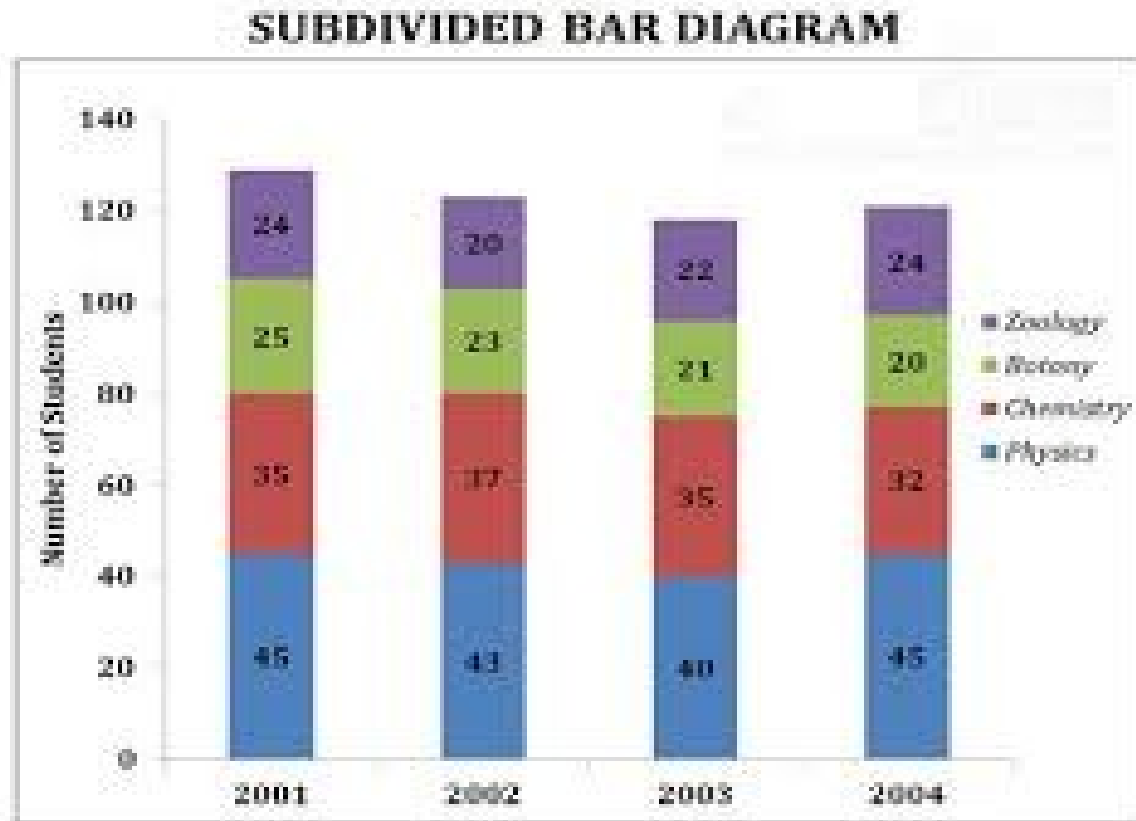
Example 1:- *The number of people in a sample with respect to their blood group.*

Example 2:- Third year students of Biology Department of Addis Ababa University registered for different courses from 2001-2004.

Component Bar graph presenting the number of people in the sample with respect to blood group taken from three different Cities



Third year students of Biology
Department in Addis Ababa University
registered for different courses from 2001-2004.



Types of bar charts (Contd...)

4. Percentage bar chart

This is a bar chart where percentage is used in each category instead of the actual amounts.

✓ ***The most widely used bar charts are percentage component bar charts.***

Example:- Recreational product sales of a sample of four states in USA.



Pie Chart

This is a diagram representation of categorical data on a circle where the circle will be partitioned into different sectors corresponding to the relative frequency of the item in the total.

- **The angle of a sector is given by the formula:**

Angle of a sector = $RF \times 360^\circ$, where RF – relative Frequency

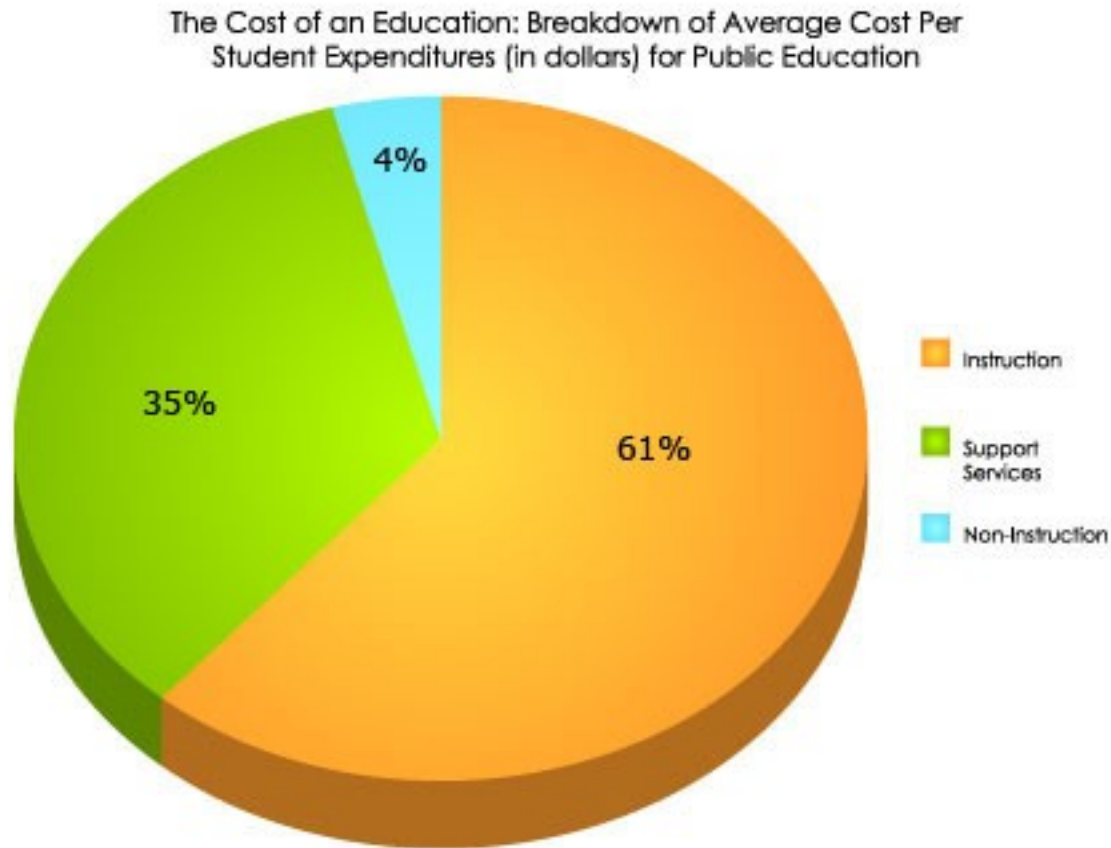
Example 1:- Breakdown of educational cost of students for public education.

Example 2:- Students grade in Network Administration course.

Pie Chart (Contd...)

- **Example:-** There are 2800 students in a certain public university who are attending the 1st year program in the academic year 2019 – 2020. The number of students with respect to their department is given by: Social Science:- 650, Physical Science:- 900, Public Health and Humanities:- 820, Others:- 430. Show this information using Pie Chart.

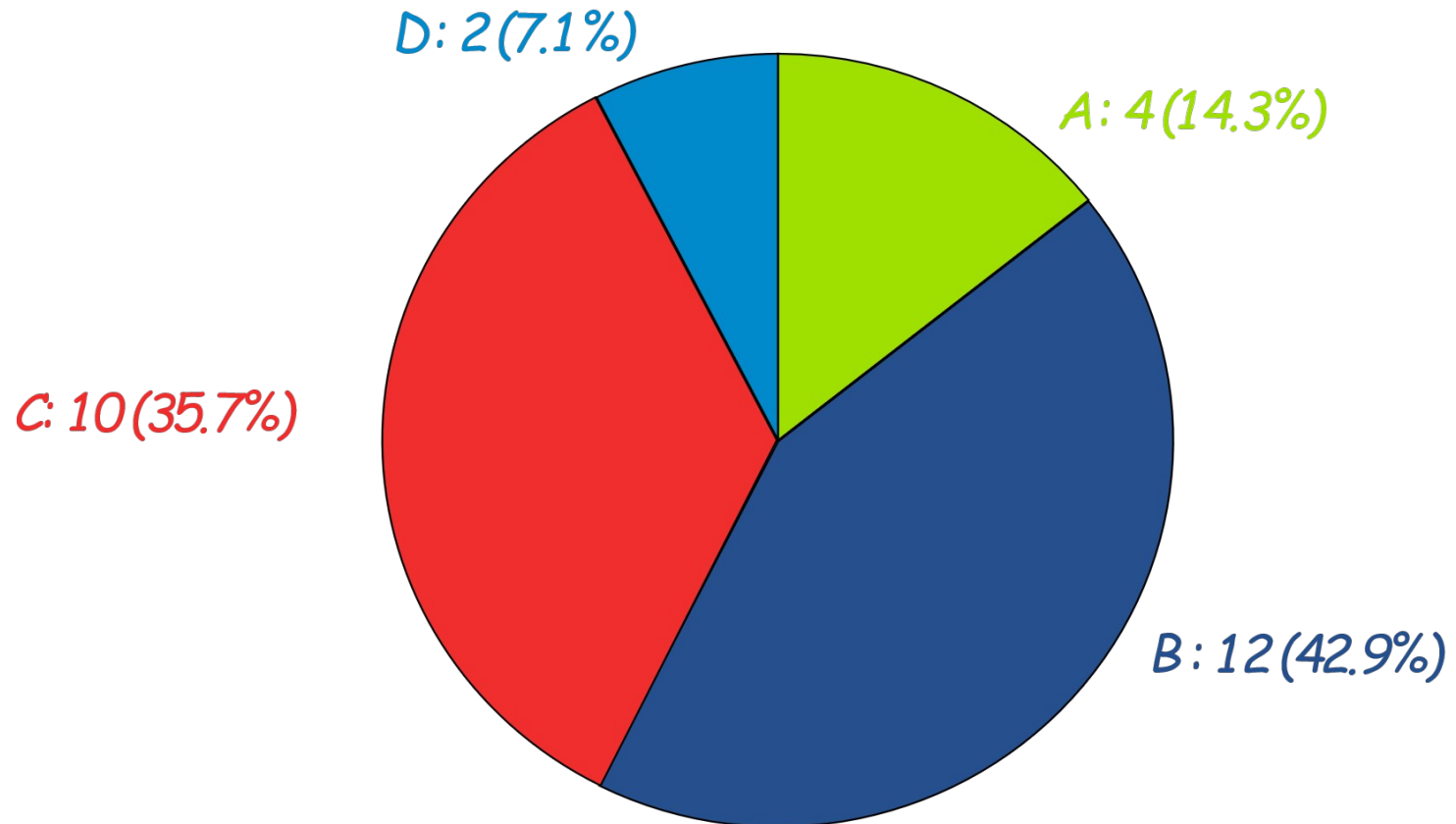
Pie Chart (Contd...)



NCES Common Core Data (CCD) 2002-03

Pie Chart (Contd...)

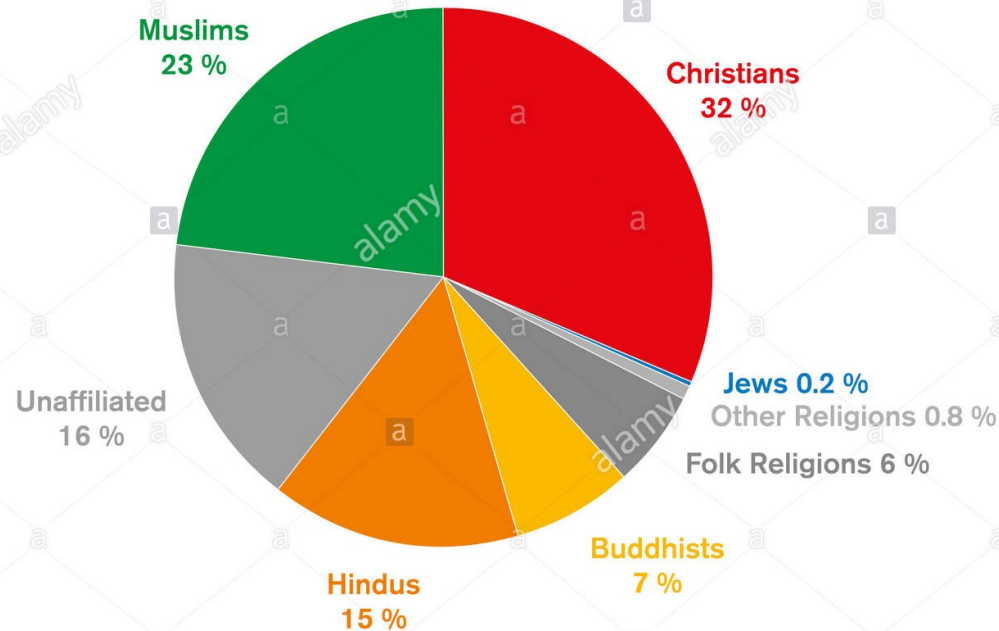
Student Grades



Pie Chart (Contd...)

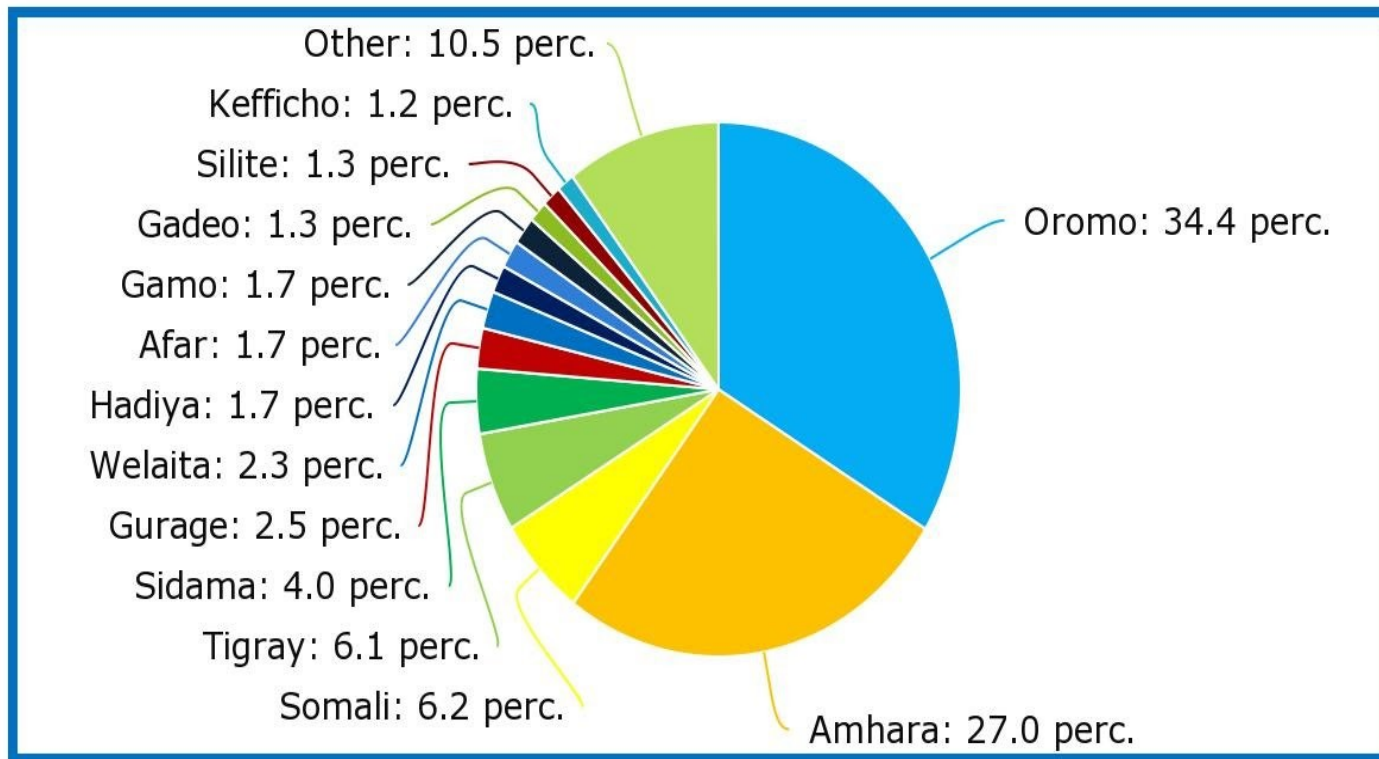
Size of Major Religious Groups

Percentage of the global population



Pie Chart (Contd...)

Ethnicity in Ethiopia



meta-chart.com