Report on Assignment8

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1 Top five import and export destinations, by total imports and total exports

1.1 Import destnations

Imports are calculated using $\text{Total value} INR$.

First group by operation on country is performed and and sum aggregate is applied. After that sort is performed and top 5 countries are extracted using head. Here are top five destinations by total imports

- CHINA P RP

- U ARAB EMTS

- SWITZERLAND

- SAUDI ARAB

- U S A

1.2 Export destnations

Exports are calculated using total value INR using the samew procedure as mentioned above. Here are top five destinations b total exports

- U ARAB EMTS

- U S A

- CHINA P RP

- SINGAPORE

- UNSPECIFIED
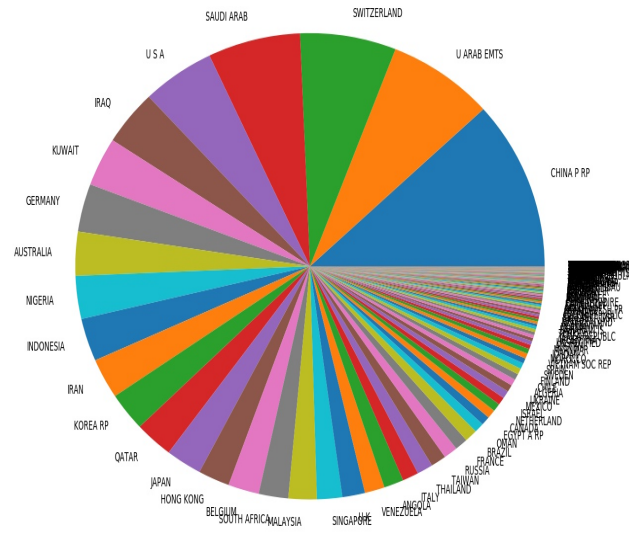
Figure 1: All countries and their contibution in total imports
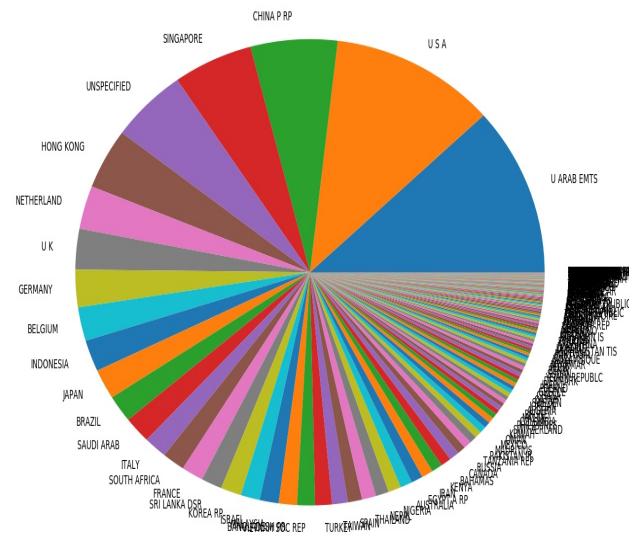
Figure 2: All countries and their contibution in total exports
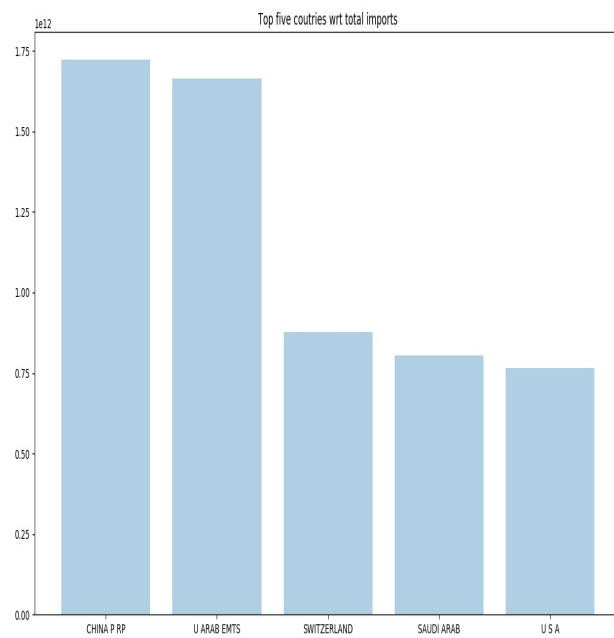
Figure 3: Top five coutries wrt total Imports

Figure 4: Top five coutries wrt total Exports

2 Top five import and export commodities

- Top five import commodities are

  1. PETROLEUM, CRUDE & PRODUCTS
  2. GOLD
  3. ELECTRONIC GOODS
  4. MACHRY EXCPT ELEC & ELECTRONIC
  5. PERLS PRCUS SEMIPRCS STONES

- Top five export commodities are

  1. PETROLEUM, CRUDE & PRODUCTS
  2. GEMS & JEWELLARY
  3. TRANSPORT EQUIPMENTS
  4. OTHER COMMODITIES
  5. MACHINERRY AND INSTRUMENTS

3 All countries to whom our export is more than Rs 10,000 Cr using query method

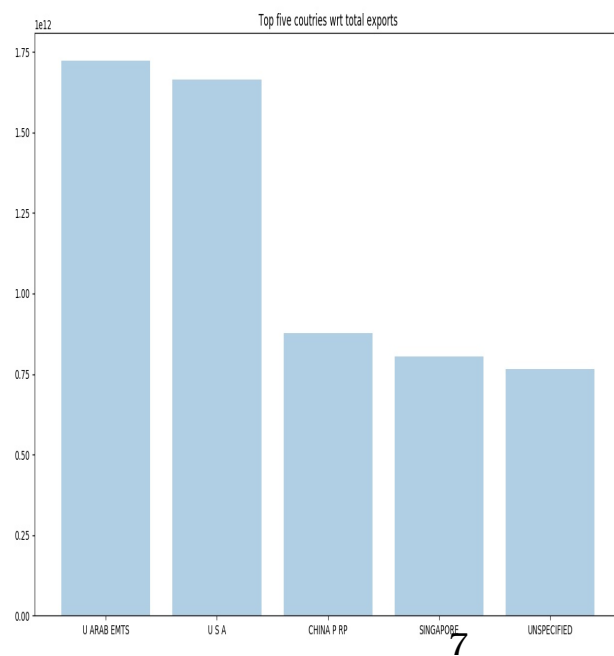|	exports	imports
AUSTRALIA	119902198011	7.130386e+11
BAHAMAS	105614860388	1.568729e+08
BANGLADESH PR	183867403716	2.792558e+10
BELGIUM	342080841360	5.000279e+11
BRAZIL	275768826842	2.065963e+11
CHINA P RP	876693687587	2.759986e+12
EGYPT A RP	117357337775	1.438294e+11
FRANCE	220219207138	2.084836e+11
GERMANY	379817399877	7.809529e+11
HONG KONG	618772346350	5.071798e+11
INDONESIA	321007511450	6.975913e+11
IRAN	115118034607	6.544814e+11
ISRAEL	193326493427	1.240863e+11
ITALY	232826478090	2.596234e+11
JAPAN	305195206178	5.814288e+11
KENYA	109873301637	5.655950e+09
KOREA RP	207814242260	6.290300e+11
MALAYSIA	191032438347	4.578630e+11
NEPAL	131302514781	2.639361e+10
NETHERLAND	439137717400	1.294779e+11
NIGERIA	130514071726	6.979970e+11
SAUDI ARAB	272081981668	1.493500e+12
SINGAPORE	803632863320	4.073224e+11
SOUTH AFRICA	227296847495	4.765721e+11
SPAIN	143687856091	8.632672e+10
SRI LANKA DSR	209514580130	3.435715e+10
TAIWAN	159861741400	2.470947e+11
THAILAND	142535348805	2.578748e+11
TURKEY	168940115453	4.437597e+10
U ARAB EMTS	1722684826477	1.711266e+12
U K	413240885916	3.662315e+11
U S A	1664743129673	1.172933e+12
UNSPECIFIED	764565004286	5.018599e+10
VIETNAM SOC REP	180849830415	8.373222e+10

Table 1: All countries to whom our export is more than Rs 10,000 Cr using query method

	exports	imports
AUSTRALIA	119902198011	7.130386e+11
BAHAMAS	105614860388	1.568729e+08
BANGLADESH PR	183867403716	2.792558e+10
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UNSPECIFIED	764565004286	5.018599e+10
VIETNAM SOC REP	180849830415	8.373222e+10

4 Creating a new table with column headings "Country", "Transaction", "Value" from table in answer 5 using melt mothod

	Country	Transaction	Value
39	CHINA P RP	Imports	2.759986e+12
29	U ARAB EMTS	Exports	1.722685e+12
63	U ARAB EMTS	Imports	1.711266e+12
31	U S A	Exports	1.664743e+12
55	SAUDI ARAB	Imports	1.493500e+12
65	U S A	Imports	1.172933e+12
5	CHINA P RP	Exports	8.766937e+11
22	SINGAPORE	Exports	8.036329e+11
42	GERMANY	Imports	7.809529e+11
32	UNSPECIFIED	Exports	7.645650e+11

Table 2: table with column headings "Country", "Transaction", "Value"

5 Commodities that we both export and import

Commodity	Exports	Imports
COMP.SOFTWARE IN PHYSICAL FORM	4.666247e+10	1.050293e+11
COTTON RAW INCLD. WASTE	4.143706e+11	3.523719e+10
COTTON YARN & FABRICS	7.350993e+11	2.776343e+10
ELECTRONIC GOODS	8.630141e+11	3.276628e+12
HANDLOOM PRODUCTS	5.443871e+10	1.089359e+09
MACHINE TOOLS	3.879292e+10	2.933595e+11
MANUFACTURES OF METALS	1.005158e+12	4.375569e+11
NON-FERROUS METALS	3.665418e+11	5.130657e+11
OTHER CEREALS	1.371015e+11	1.406401e+09
OTHER COMMODITIES	1.453747e+12	1.720925e+12
PETROLEUM, CRUDE & PRODUCTS	5.955936e+12	1.663531e+13
PROJECT GOODS	9.588092e+09	7.790110e+11
PULSES	2.345744e+10	2.166988e+11
SPICES	2.853915e+11	4.780713e+10
SUGAR	1.734298e+11	3.385539e+10
TEA	8.755605e+10	4.933388e+09
TRANSPORT EQUIPMENTS	2.014760e+12	1.420874e+12
WHEAT	1.151162e+11	6.112098e+07

Table 3: Commodities that we both export and import

6 Random content

Here are formulas for gaussian distribution.

$$F(x) = \frac{1}{\sigma\sqrt{2\pi}} e^{\frac{-(x-\mu)^2}{2\sigma^2}} \tag{1}$$

where,

$$\mu = \frac{1}{N} \sum_{i=1}^{N} x_i \tag{2}$$

$$\sigma^2 = \frac{1}{N} \sum_{i=1}^{N} (x_i - \mu)^2 \tag{3}$$

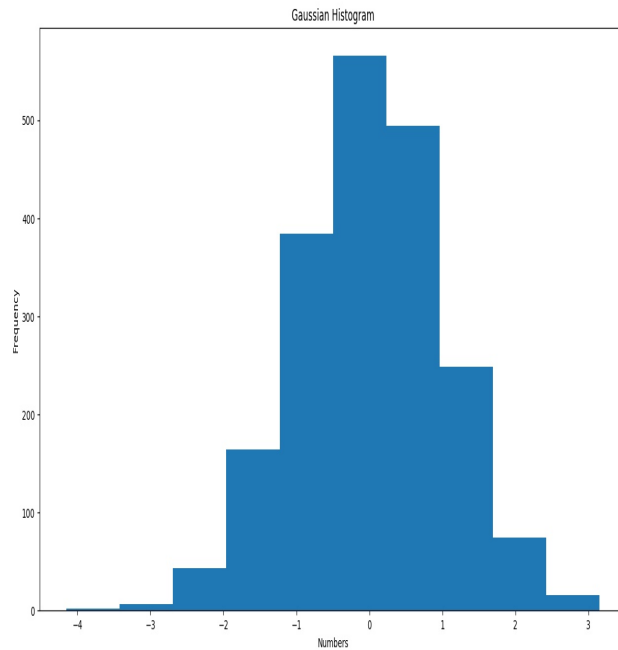Here, is the histogram which decribes above gaussian distribution

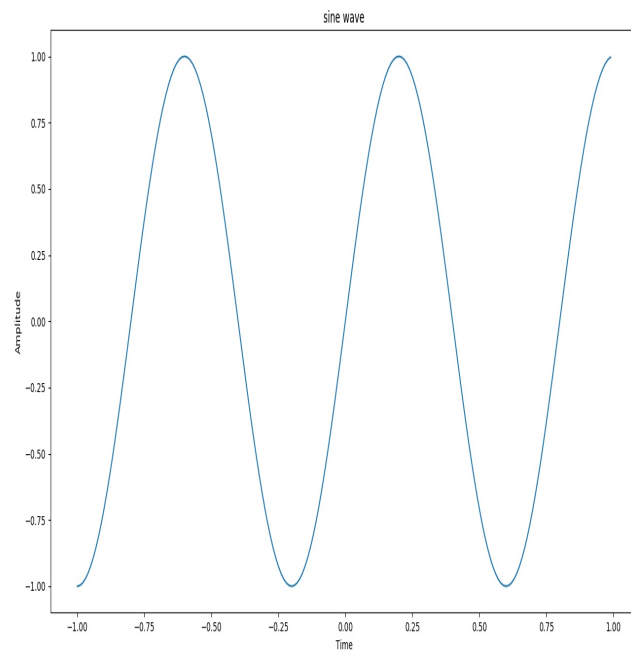
Figure 5: Gaussian histogram
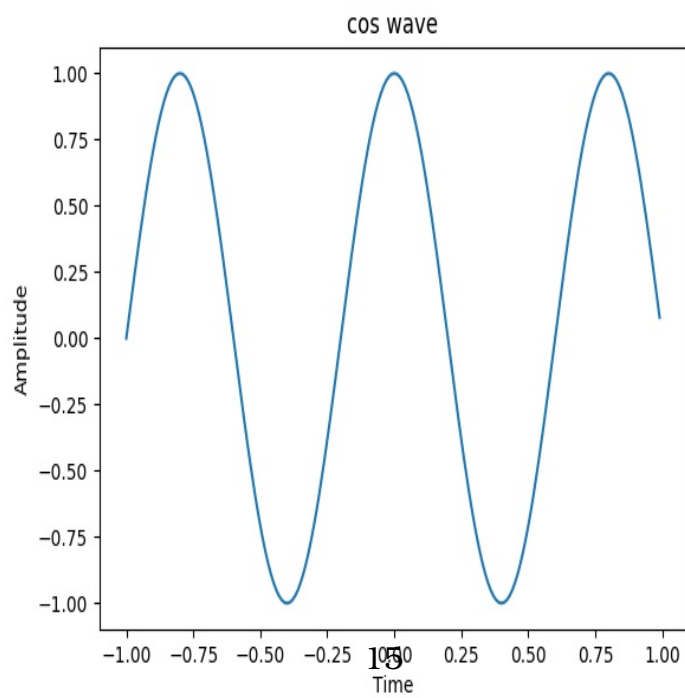
Some more random Line Charts

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Figure 6: Sine wave

Figure 7: Cos wave

Some more formulas

Binomial distribution

$$f(k; p) = p^k(1-p)^{1-k}.....for k \in (0, 1) \tag{4}$$

Beta distribution

$$PDF = \frac{x^{\alpha-1}(1-x)^{\beta-1}}{B(\alpha, \beta)}.....where B(\alpha, \beta) = \frac{\Gamma(\alpha)\Gamma(\beta)}{\Gamma(\alpha+\beta)} \tag{5}$$