

Introduction to Statistics and Data Science using *eStat*

Chapter 2 Visualization of Categorical Data

2.2 Visualization of Categorical Summary Data

Jung Jin Lee

Professor of Soongsil University, Korea

Visiting Professor of ADA University, Azerbaijan

2.2 Visualization of Summary Data

2.2.1 Summary Data

- Survey on gender in a class, and write them as 'male', 'female', 'male' and 'male'... => **raw data**
- Compile the raw data as a frequency distribution table

Gender	Student
Male	6
Female	4

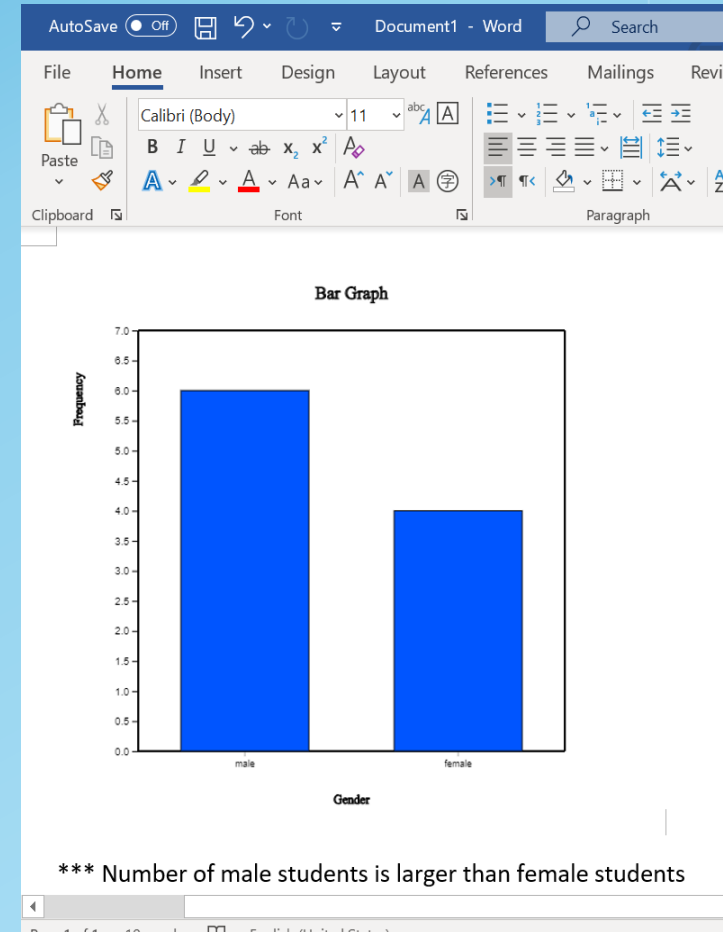
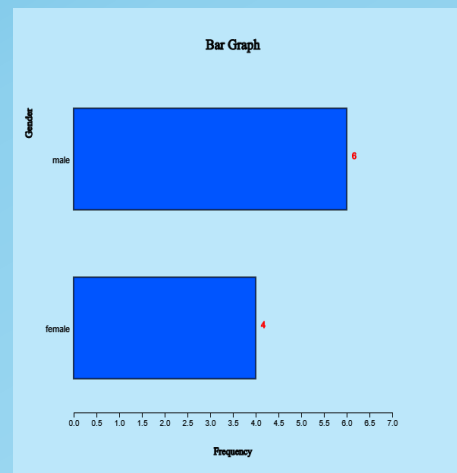
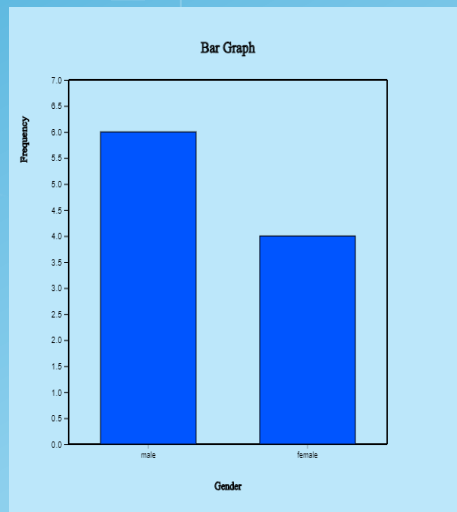
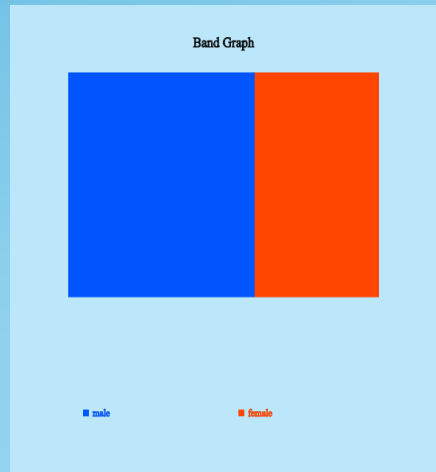
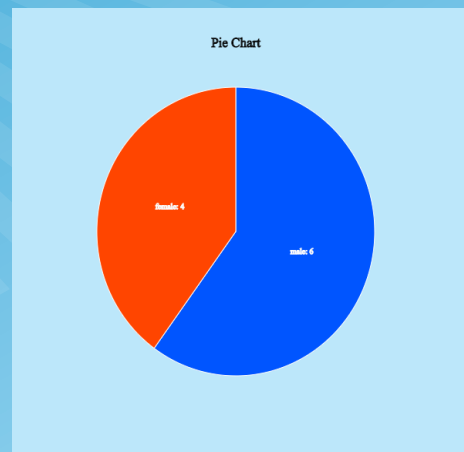
=> **summary data.**

- Textbooks or governmental institutions provide information in the form of summary data.

2.2 Visualization of Summary Data

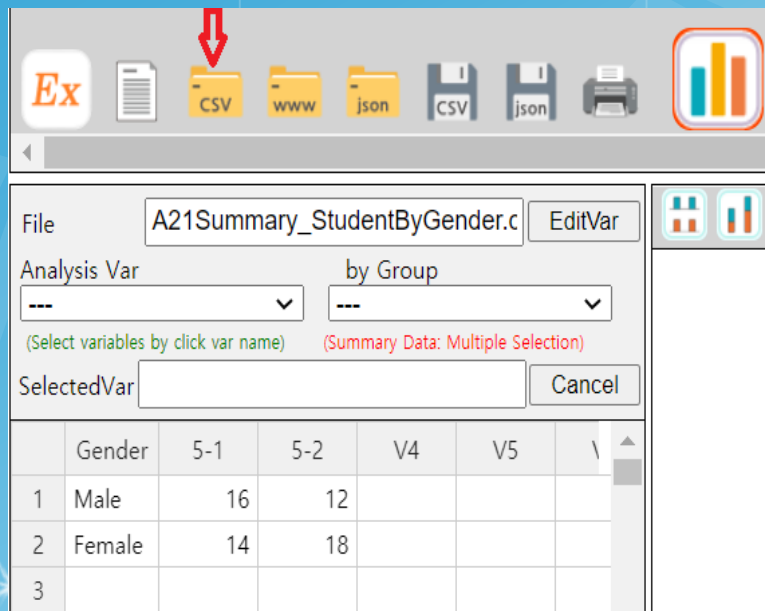
[EX 2.2.1] Summary data on gender of a class

Gender	Student
Male	6
Female	4



2.2 Visualization of Summary Data

[EX 2.2.3] Summary data on gender of two class

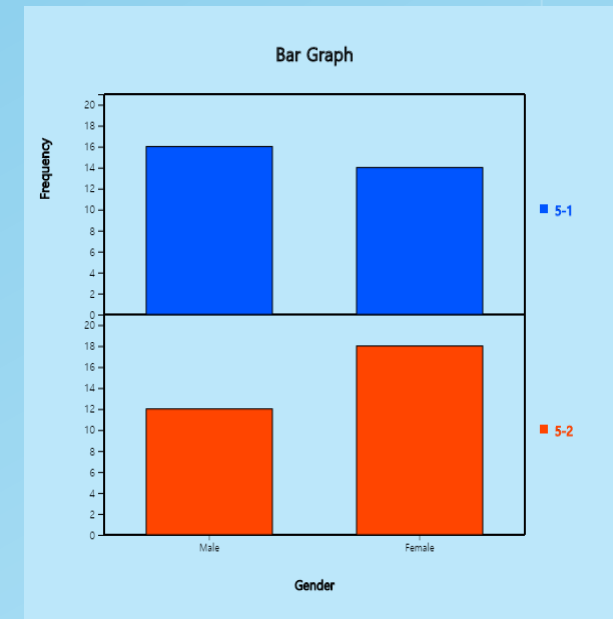


	Gender	5-1	5-2	V4	V5
1	Male	16	12		
2	Female	14	18		
3					

A21Summary_StudentByGender - Notepad

File Edit Format View Help

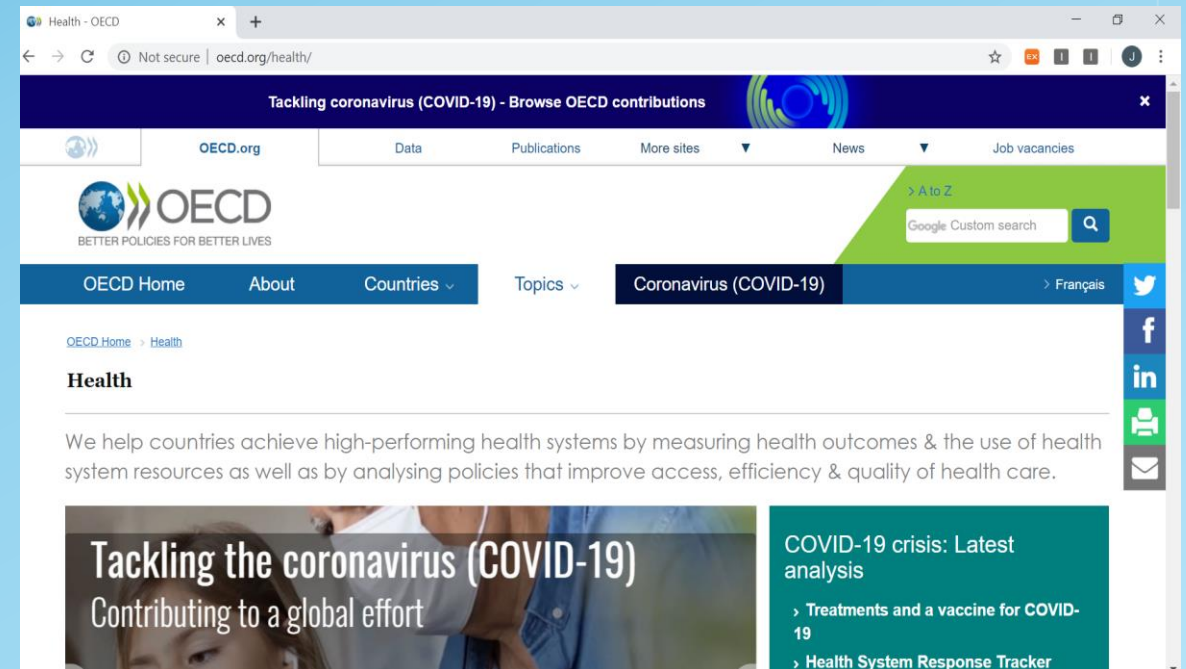
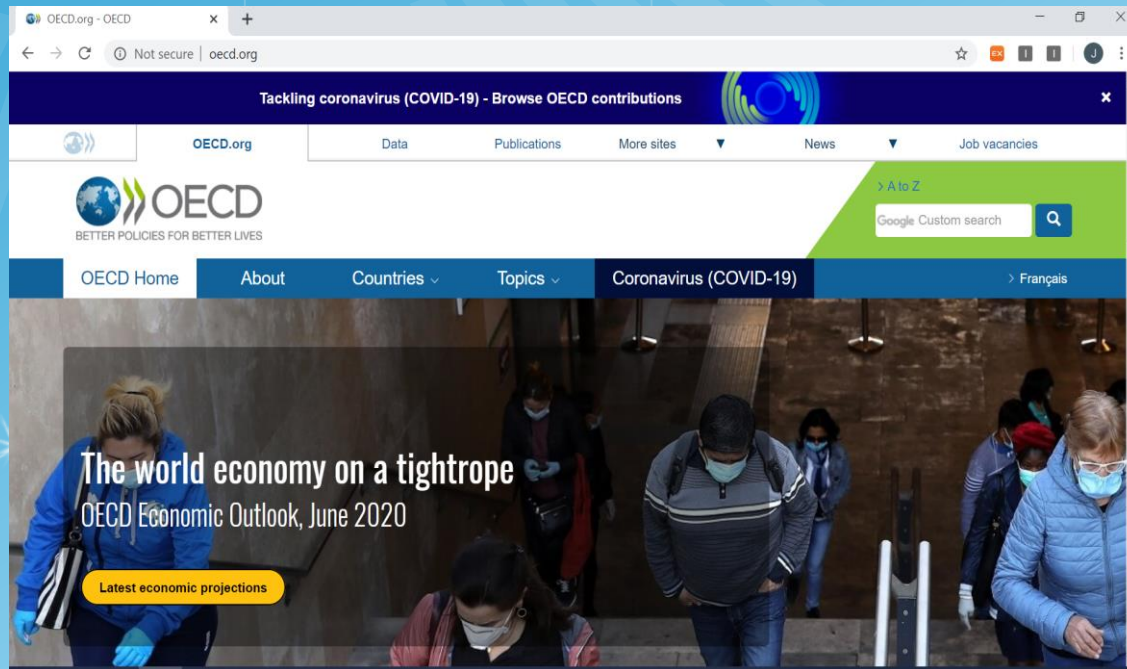
Gender, 5-1, 5-2
Male, 16, 12,
Female, 14, 18



2.2 Visualization of Summary Data

[Ex 2.2.2] (Life Expectancy at Birth : OECD)

<https://www.oecd.org>



2.2 Visualization of Summary Data

[Ex 2.2.2] (Life Expectancy at Birth : OECD) <https://www.oecd.org>



OECD Health Statistics 2020

The main OECD Health database includes more than 1200 indicators covering all aspects of health systems and key partners. Access [time series in 12 datasets](#), and the full list of indicators in various languages. The full list is also available in one single user-friendly document.

> **OECD Health Statistics 2020: Frequently Requested Data** (June version available)

[Read more](#)



Health Care Quality

The HCQO project compares health care quality across OECD countries. It covers areas such as Primary Care, Acute Care, Mental Health and Long-term Care.

[Read more](#)

OECD Health Statistics 2020 - Frequently Requested Data



JUNE 2020

[OECD Health Statistics 2020: website](#)
[Statistiques de l'OCDE sur la santé 2020 : site internet](#)

[Access all data series in OECD.Stat via https://oe.cd/ds/health-statistics](https://oe.cd/ds/health-statistics)

Access the full information on **definitions, sources and methods** from one single user-friendly document:
<http://www.oecd.org/health/health-systems/Table-of-Content-Metadata-OECD-Health-Statistics-2020.pdf>

Health expenditure

- [Current expenditure on health, % of gross domestic product](#)
- [Current expenditure on health, per capita, US\\$ purchasing power parities](#)
- [Annual growth rate of current expenditure on health, per capita, in real terms](#)
- [Government and compulsory health insurance schemes, % of current expenditure on health](#)

Updated

2.2 Visualization of Summary Data

[Ex 2.2.2] (Life Expectancy at Birth : OECD)

<https://www.oecd.org>

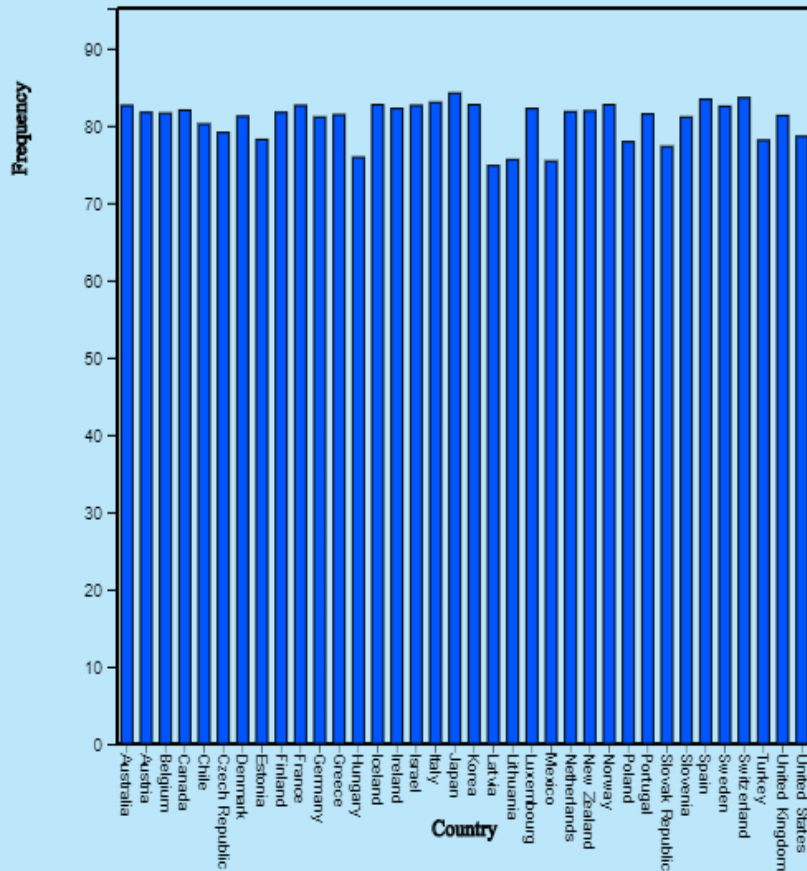
	1960	1961	1962	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2017 (or nearest year)
Australia	70.9	71.2	71	81.1	81.4	81.5	81.6	81.8	82	82.1	82.2	82.4	82.5	82.5	82.6	82.6	82.6
Austria	68.7	69.7	69.4	80	80.3	80.5	80.4	80.7	81.1	81	81.2	81.6	81.3	81.7	81.7	81.7	81.7
Belgium	69.8	70.6	70.3	79.5	79.9	79.8	80.1	80.3	80.7	80.5	80.7	81.4	81.1	81.5	81.6	81.6	81.6
Canada		71.3		80.3	80.4	80.6	80.8	81.1	81.3	81.5	81.7	81.8	81.9	82	82	82	82.0
Chile				78	77.5	78.1	78.2	78	78.7	78.7	79.5	79.7	79.9	80.2			80.2
Czech Republic	70.7	70.7	69.9	76.7	77	77.3	77.4	77.7	78	78.2	78.3	78.9	78.7	79.1	79.1	79.1	79.1
Denmark	72.4			78.4	78.4	78.8	79	79.3	79.9	80.1	80.4	80.8	80.8	80.9	81.2	81.2	81.2
Estonia	68.9	69.2	69.4	73.1	73.2	74.2	75.2	75.9	76.4	76.5	77.3	77.2	77.7	77.8	78.2	78.2	78.2
Finland	69			79.5	79.6	79.9	80.1	80.2	80.6	80.7	81.1	81.3	81.6	81.5	81.7	81.7	81.7
France	70.3	71	70.5	81	81.2	81.4	81.5	81.8	82.3	82.1	82.3	82.8	82.4	82.6	82.6	82.6	82.6
Germany	69.1	69.7	69.9	79.8	80.1	80.2	80.3	80.5	80.5	80.6	80.6	81.2	80.7	81.1	81.1	81.1	81.1
Greece		72	71.7	79.9	79.7	80.3	80.4	80.7	80.8	80.7	81.4	81.5	81.1	81.5	81.4	81.4	81.4
Hungary	68.1	69	67.9	73.5	73.6	74.2	74.4	74.7	75	75.2	75.7	75.9	75.7	76.2	75.9	75.9	75.9
Iceland		73.6	73.8	81.2	81.5	81.7	81.8	82	82.4	83	82.1	82.9	82.5	82.3	82.7	82.7	82.7
Ireland	70			79.3	79.7	80.2	80.3	80.8	80.8	80.9	81	81.4	81.5	81.8	82.2	82.2	82.2
Israel				80.6	80.6	81	81.5	81.7	81.7	81.8	82.1	82.2	82.1	82.5	82.6	82.6	82.6
Italy		69.8		81.4	81.5	81.6	81.7	82.1	82.3	82.3	82.8	83.2	82.6	83.3	83	83	83.0
Japan	67.8	68.4	68.7	82.4	82.6	82.7	83	82.9	82.7	83.2	83.4	83.7	83.9	84.1	84.2	84.2	84.2
Korea				78.8	79.2	79.6	80	80.2	80.6	80.9	81.4	81.8	82.1	82.4	82.7	82.7	82.7
Latvia				70.6	70.8	72	72.6	73	73.7	73.9	74.1	74.3	74.6	74.7	74.8	74.8	74.8
Lithuania				71.1	70.9	71.8	72.9	73.3	73.7	74	74.1	74.7	74.5	74.8	75.6	75.6	75.6
Luxembourg	69.4			79.4	79.5	80.6	80.7	80.7	81.1	81.5	81.9	82.3	82.4	82.8	82.2	82.2	82.2
Mexico	57.5	58.2	58.8	74.1	74.2	74.1	74	74.1	74.2	74.4	74.6	74.8	75	75.2	75.4	75	75.4
Netherlands	73.5	73.8	73.4	79.9	80.3	80.5	80.8	81	81.3	81.2	81.4	81.8	81.6	81.6	81.8	81.8	81.8
New Zealand		71.1	71.2	80.1	80.3	80.5	80.7	80.8	81	81.2	81.4	81.5	81.7	81.7	81.9	81.9	81.9
Norway	73.8	73.8	73.7	80.6	80.6	80.8	81	81.2	81.4	81.5	81.8	82.2	82.4	82.5	82.7	82.7	82.7
Poland	67.8	67.8	67.5	75.3	75.4	75.7	75.8	76.5	76.8	76.9	77.1	77.7	77.6	78	77.9	77.9	77.9
Portugal	63.9	62.7	64.1	79	79.2	79.5	79.7	80	80.6	80.5	80.8	81.2	81.2	81.2	81.5	81.5	81.5
Slovak Republic	70.3	70.9	70.4	74.4	74.5	75	75.3	75.6	76.1	76.2	76.5	76.9	76.7	77.3	77.3	77.3	77.3
Slovenia				78.3	78.3	79.1	79.3	79.8	80.1	80.2	80.4	81.2	80.9	81.3	81.1	81.1	81.1
Spain	69.8			81.1	81.2	81.5	81.9	82.4	82.6	82.5	83.2	83.3	82.9	83.4	83.4	83.4	83.4
Sweden	73.1	73.5	73.4	81	81.1	81.3	81.5	81.6	81.9	81.8	82	82.3	82.3	82.4	82.5	82.5	82.5
Switzerland	71.4	71.8	71.3	81.7	82	82.2	82.3	82.6	82.8	82.8	82.9	83.3	83	83.7	83.6	83.6	83.6
Turkey	48.3	49	49.7	73.4	73.7	73.9	74.1	74.3	74.6	74.6	78	78	78	78	78.1	78.1	78.1
United Kingdom	70.8	70.7		79.5	79.7	79.8	80.4	80.6	81	81	81.1	81.4	81	81.2	81.3	81.3	81.3
United States	69.9	70.4	70.2	77.8	78.1	78.1	78.5	78.6	78.7	78.8	78.8	78.9	78.7	78.7	78.6	78.6	78.6
OECD AVERAGE																	80.7

	Country	LifeExp	V3	V4
1	Australia	82.6		
2	Austria	81.7		
3	Belgium	81.6		
4	Canada	82.0		
5	Chile	80.2		
6	Czech Republic	79.1		
7	Denmark	81.2		
8	Estonia	78.2		
9	Finland	81.7		
10	France	82.6		
11	Germany	81.1		
12	Greece	81.4		
13	Hungary	75.9		
14	Iceland	82.7		
15	Ireland	82.2		
16	Israel	82.6		
17	Italy	83.0		
18	Japan	84.2		
19	Korea	82.7		
20	Latvia	74.8		
21	Lithuania	75.6		
22	Luxembourg	82.2		
23	Mexico	75.4		
24	Netherlands	81.8		
25	New Zealand	81.9		

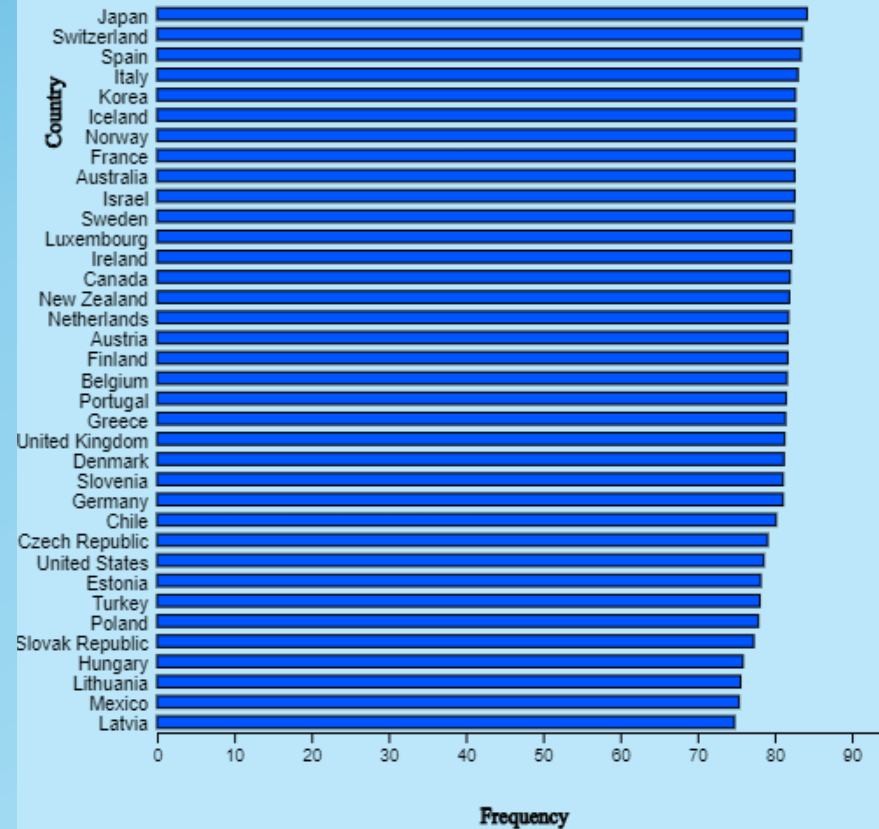
2.2 Visualization of Summary Data

[Ex 2.2.2] (Life Expectancy at Birth : OECD)

Bar Graph



Bar Graph



2.2 Visualization of Summary Data

[Ex 2.2.4] (Male and Female Population by Age Group– Two Group Summary Data)

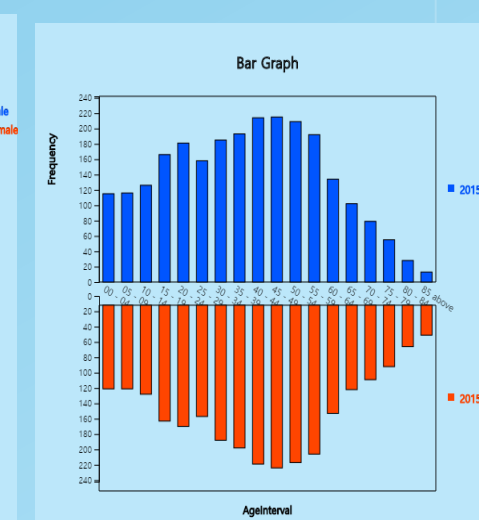
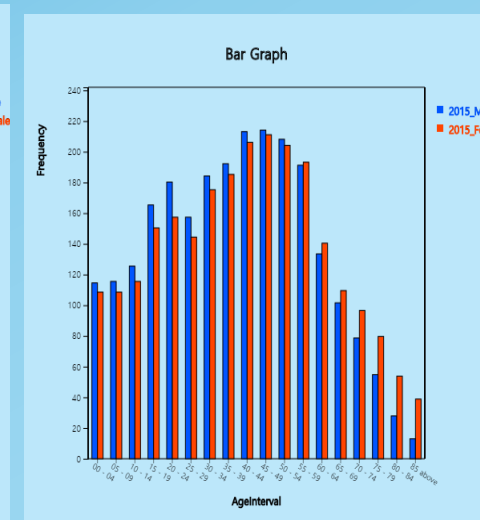
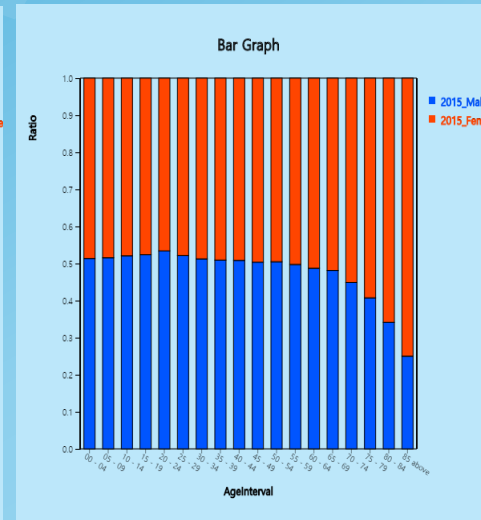
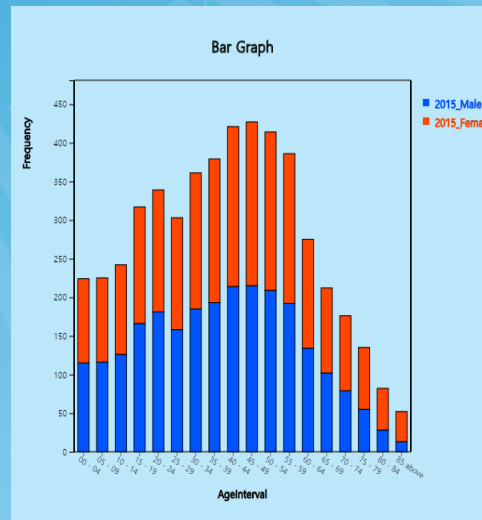
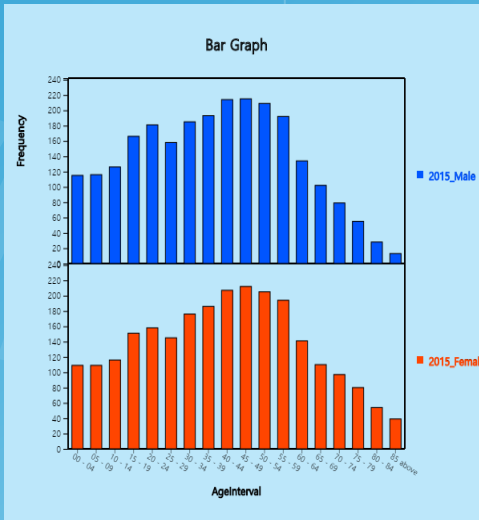
In 2015, the male and female populations by age group in Korea are shown in Table 2.2.3.

Using this data, draw bar chart, pie chart, band graph, and line graph of the population by age group and examine their characteristics.

Age Interval	2015 Male	2015 Female
00 - 04	115	109
05 - 09	116	109
10 - 14	126	116
15 - 19	166	151
20 - 24	181	158
25 - 29	158	145
30 - 34	185	176
35 - 39	193	186
40 - 44	214	207
45 - 49	215	212
50 - 54	209	205
55 - 59	192	194
60 - 64	134	141
65 - 69	102	110
70 - 74	79	97
75 - 79	55	80
80 - 84	28	54
over 85	13	39

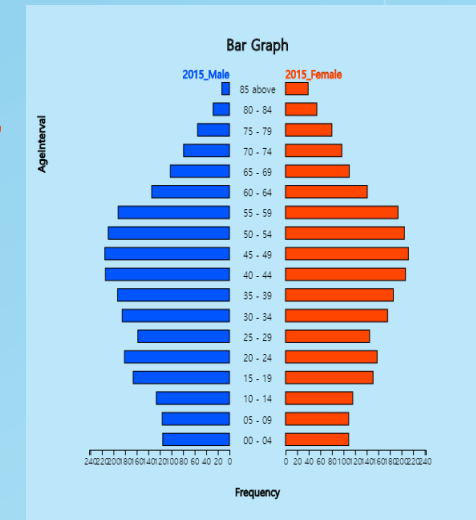
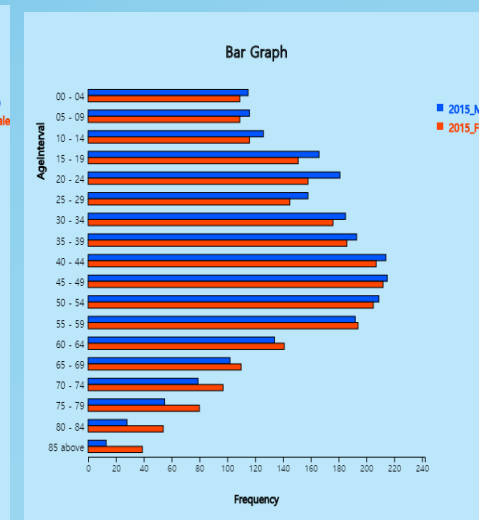
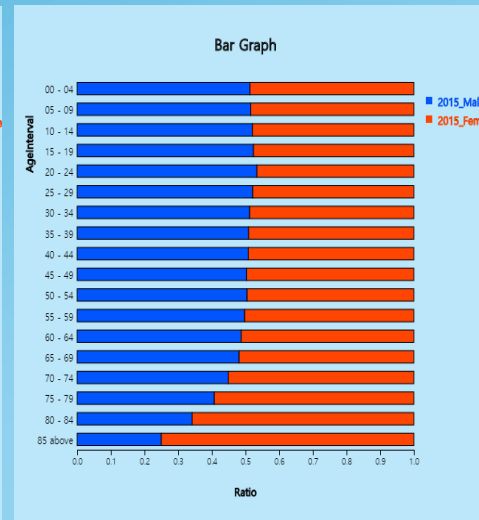
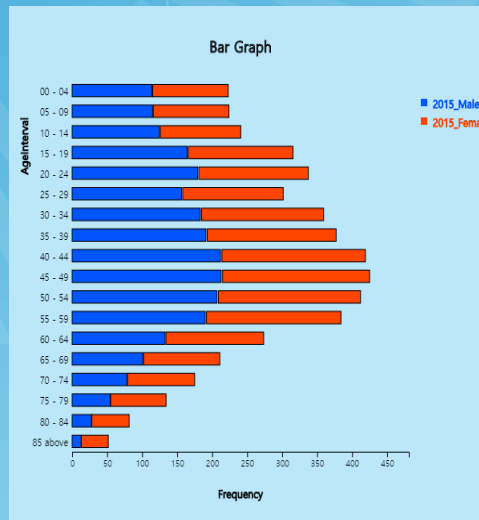
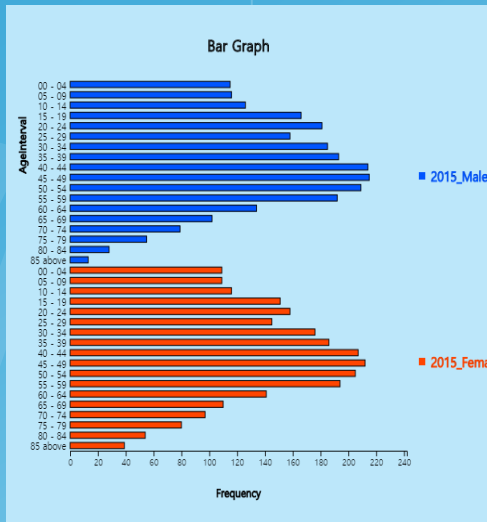
2.2 Visualization of Summary Data

[Ex 2.2.4] (Male and Female Population by Age Group) – Two Group



2.2 Visualization of Summary Data

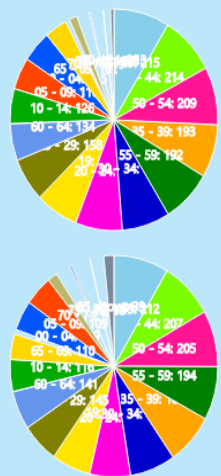
[Ex 2.2.4] (Male and Female Population by Age Group) – Two Group



2.2 Visualization of Summary Data

[Ex 2.2.4] (Male and Female Population by Age Group) – Two Group

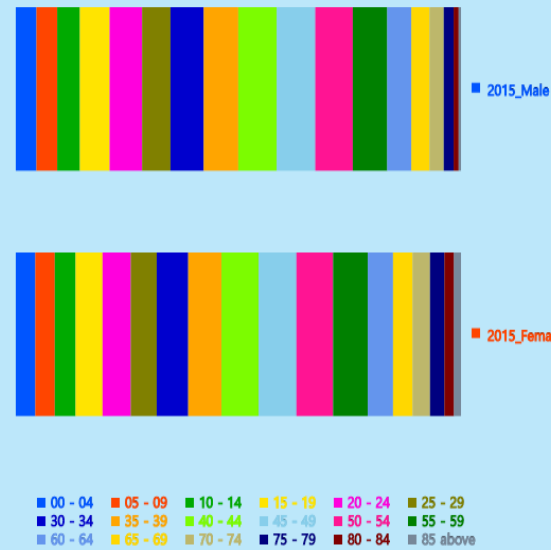
Pie Chart



2015_Male

2015_Female

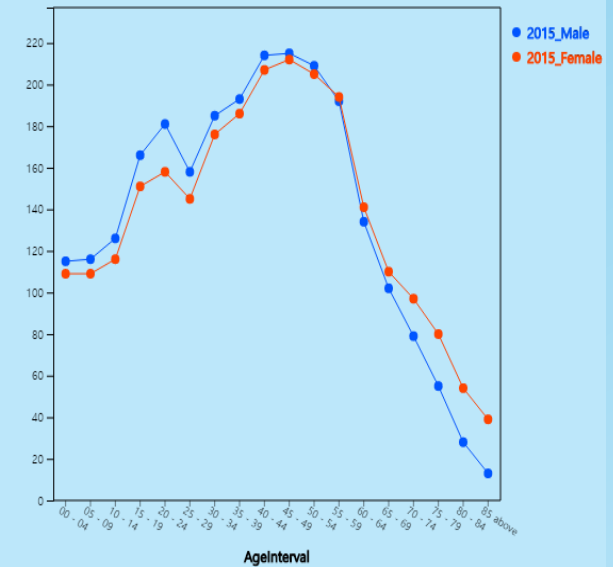
Band Graph



2015_Male

2015_Female

Line Graph



2.2 Visualization of Summary Data

[Example 2.2.5] (OECD Export – Import by Country in 2017) – two group summary data

Ex ⇒ eBook ⇒ EX02020_OECD_ExportImport_2017.csv.

Use a line graph to find out the characteristics of export and import of each country temperature change.

File: 0110ECD_ExportImport_2017.csv EditVar

X Var: 1: Country by Group: 3: Import

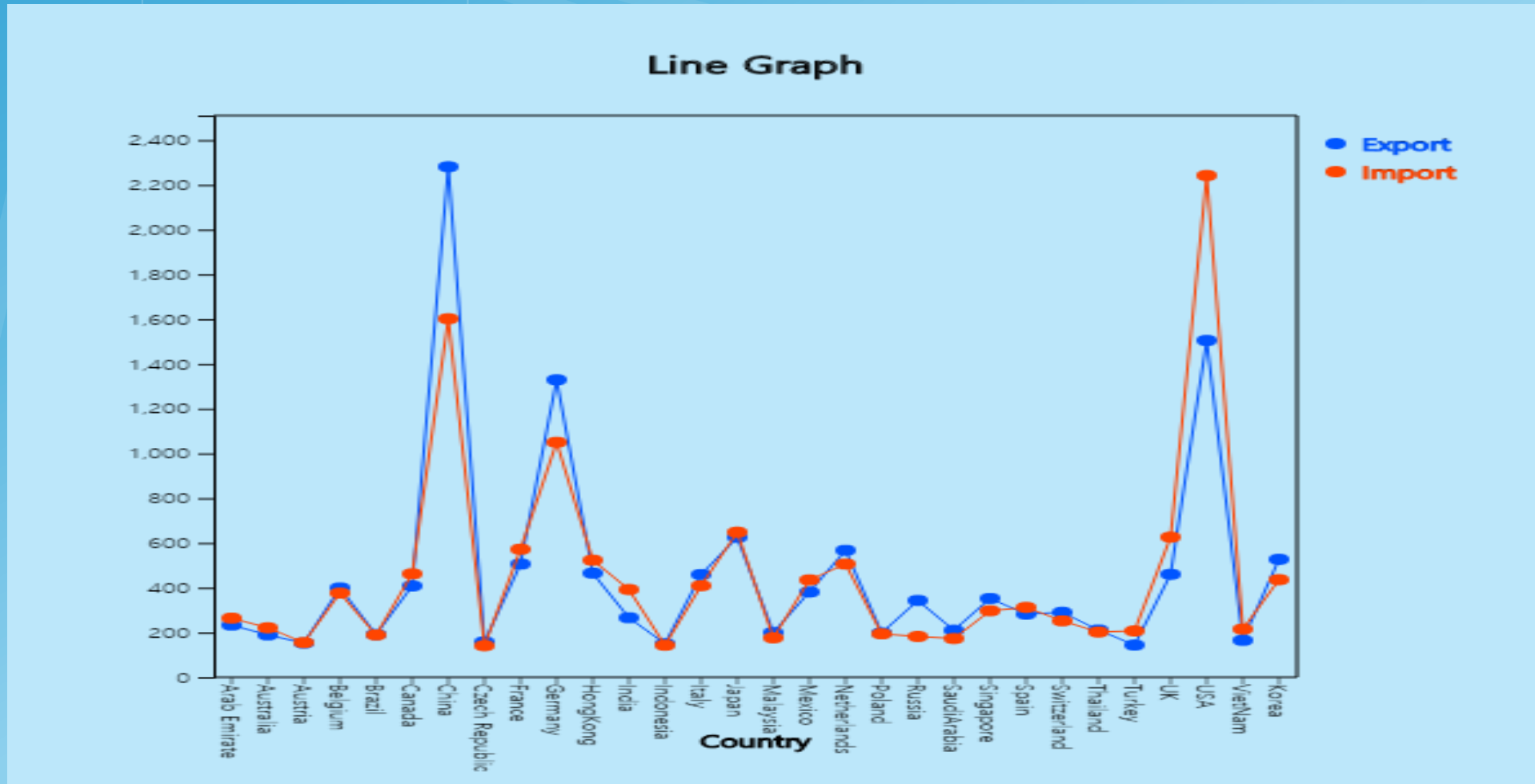
(Selected data: Summary Data) (Summary Data: Multiple Selection)

SelectedVar: V1 by V2,V3, Cancel

	Country	Export	Import	V4	V
1	Arab Emirate	233	264		
2	Australia	189	221		
3	Austria	153	155		
4	Belgium	399	376		
5	Brazil	191	189		
6	Canada	408	462		
7	China	2281	1602		
8	Czech Republic	158	141		
9	France	506	572		
10	Germany	1329	1050		
11	HongKong	465	523		
12	India	266	392		
13	Indonesia	150	143		
14	Italy	459	409		
15	Japan	625	648		
16	Malaysia	200	176		
17	Mexico	381	435		
18	Netherlands	567	506		
19	Poland	198	194		

2.2 Visualization of Summary Data

[Example 2.2.5] (OECD Export – Import by Country)





Thank you