



INFO-B 585 Biomedical Analytics

Microsoft Excel

Guest Teaching Demonstration – Ling Tong



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Theory



Practice



Study Objectives:



Data



Analysis



Idea

Introduction



Microsoft Excel



Why Excel?



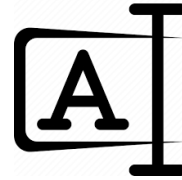
Easy to use

1. File easy to transfer
2. Installed everywhere
3. Can load large data
4. Work in cross departments



Multiple Data type

1. Applies to multiple Scenario
2. E.g. Bank
3. Electronic health records
4. Statistical Analysis
5. Travel Expenses report



12

(number)

10^2

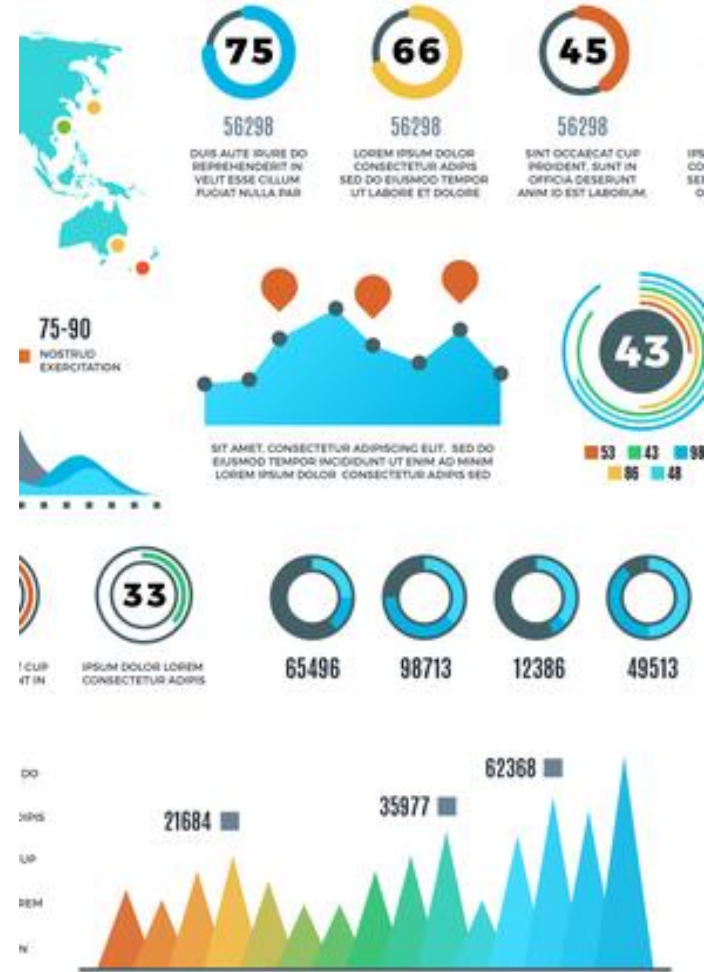
(scientific)

$\frac{1}{2}$

(fraction)

Data Visualization

1. Built-in charting and analyzing tools
2. Example: Dashboard



Patient Demographics Overview

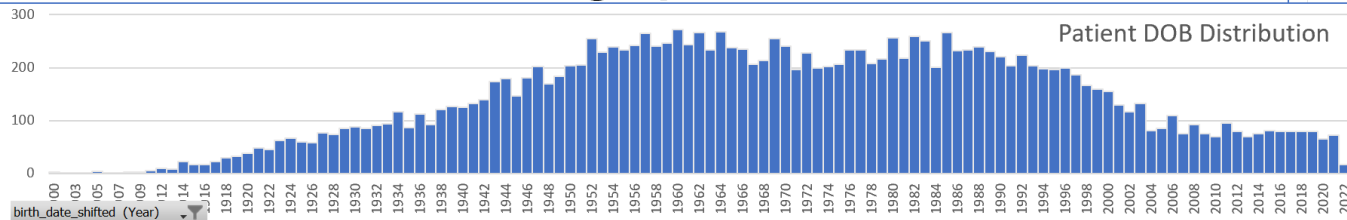
dx_date_shifted

All Periods

YEARS

2016 2017 2018 2019 2020 2021 2022

Patient DOB Distribution



race

- Patient Refused
- Unknown
- White or Caucasian

enc_type

- AV
- ED
- IP
- IS
- NI
- OA
- OS
- OT
- TH

insurance_status

- Other
- Private
- Public
- SELFPAY
- Unknown

provider_id

- 10000166
- 10000470
- 10000655
- 10000757
- 10000856
- 10001324
- 10001403
- 10001417
- 10001553
- 10001644
- 10002031
- 10002096
- 10002661
- 10003
- 10003226
- 10003265
- 10003466
- 10003490
- 10003610
- 10003623
- 10004073
- 10004548
- 10004919
- 10005
- 10005118
- 10005183
- 10005294
- 10005391
- 10005463
- 10005618
- 10005906
- 10005926
- 10005935
- 10005973
- 10006
- 10006248

sex

- Female
- Male
- Unknown

vital_status

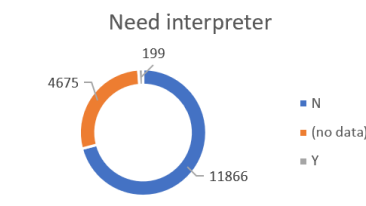
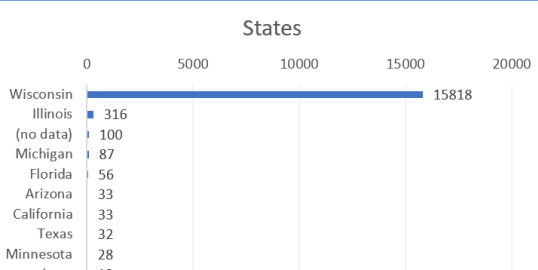
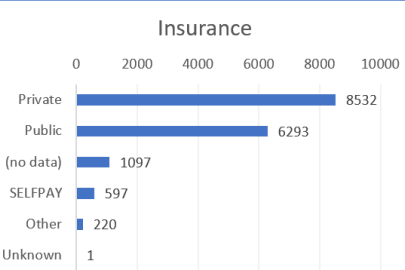
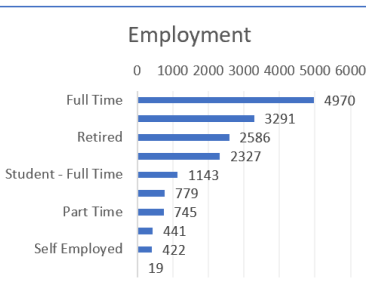
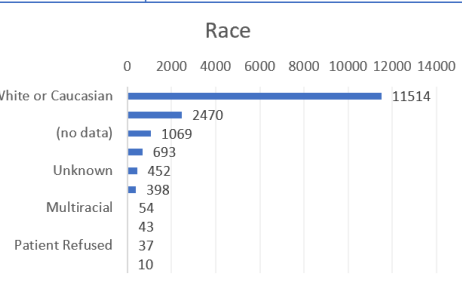
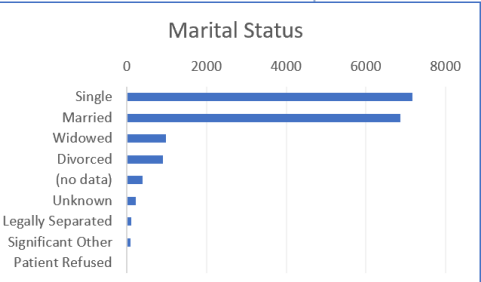
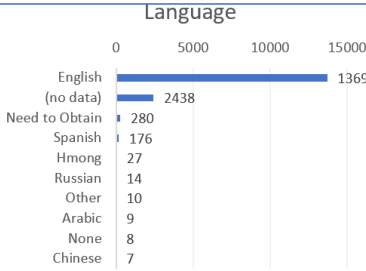
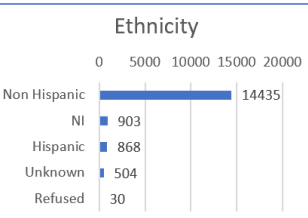
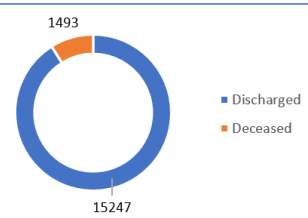
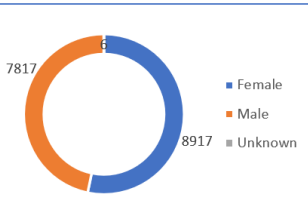
- Deceased

marital_status

- Divorced
- Legally Separated
- Married

employment_status

- Retired
- Self Employed
- Student - Full Time
- Student - Part Time



Patient Diagnosis Overview

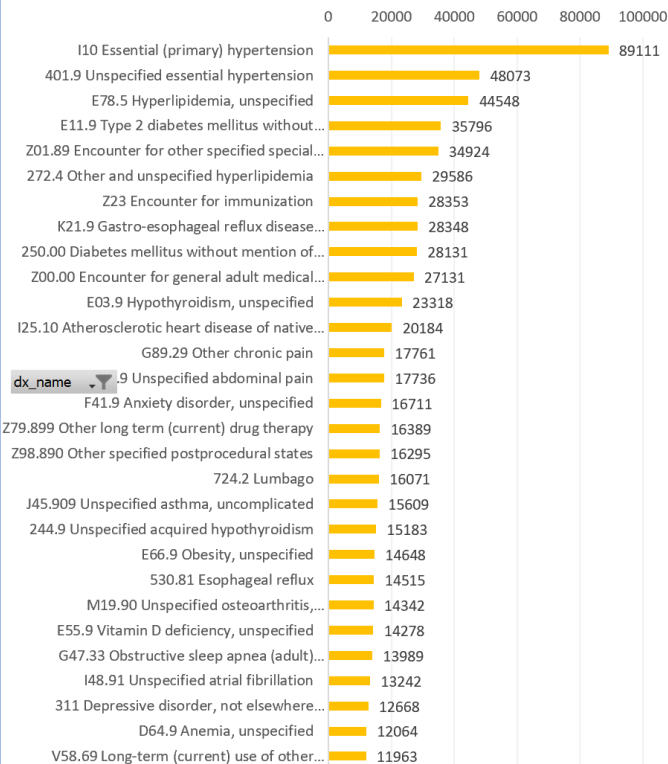
dx_date_shifted

All Periods

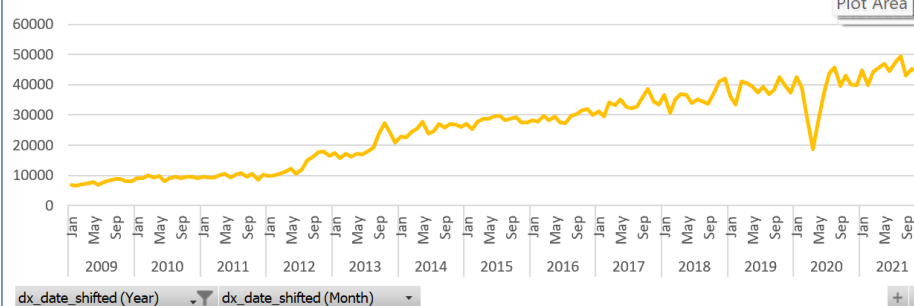
YEARS ▾

2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022

Top Diagnosis

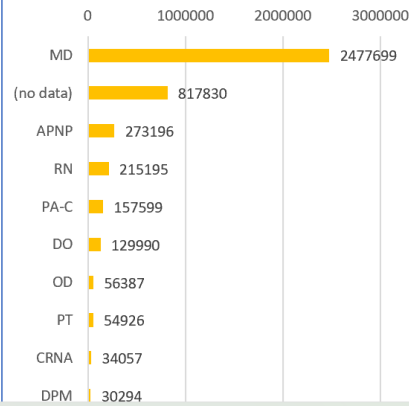


of Diagnosis

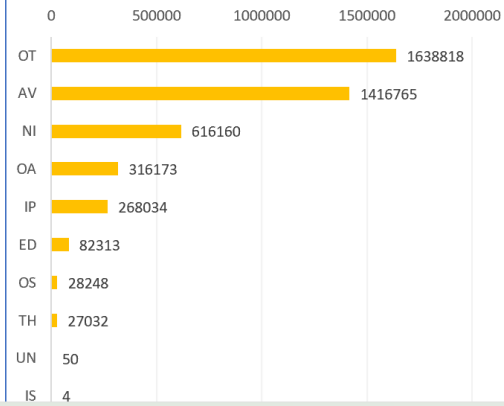


dx_date_shifted (Year) ▾ dx_date_shifted (Month) ▾

Diagnosed by



Encounter Type

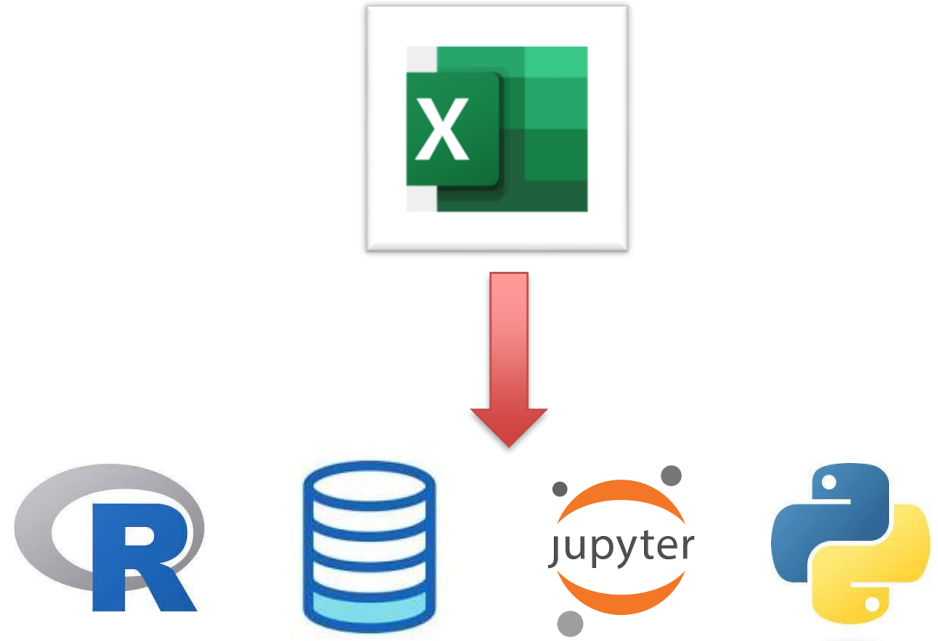


Description

- Abdominal hernia
- Abdominal pain and other digestiv
- Abnormal findings related to subst
- Abnormal findings without diagno
- Acquired absence of limb or organ
- Acquired deformities (excluding fo
- Acquired foot deformities
- Acute and chronic tonsillitis
- Acute and unspecified renal failure
- Acute bronchitis
- Acute hemorrhagic cerebrovascul
- Acute myocardial infarction
- Acute phlebitis; thrombophlebitis
- Acute posthemorrhagic anemia
- Acute pulmonary embolism
- Acute rheumatic heart disease
- Adverse effects of drugs and medi
- Adverse effects of drugs and medi
- Alcohol-related disorders
- Allergic reactions
- Allergic reactions, subsequent enc
- Amputation of a limb, initial encou
- Amputation of a limb, subsequent
- Anal and rectal conditions
- Anesthesia complications during p
- Antenatal screening

File integration

1. Integrate into data analysis tools
2. Flexibility



Microsoft Excel Essential skills



Spreadsheet



Data Visualization
Application



Data Analysis
Toolbox

Spreadsheet

1. Describing Data:

- Data entry
- Formatting
- Editing
- Searching
- Sorting
- Filtering



Data Visualization Application

1. Create Data Summary
2. Creating Charts
3. Describing and Presenting Charts
4. Interpret chart results



Data Analysis Toolbox

1. Support the real problems
2. Improve efficiency, reduce errors
3. Enhance healthcare outcome, etc



Descriptive vs Summative



Descriptive: Search for some **[Data]** you need

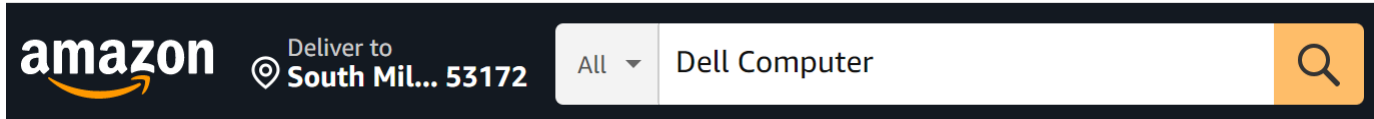


Summative: Look for valuable **[Insights]**

A Computer Search in



Search Function



over 8,000 results for "Dell Computer"

How to Narrow down?

Desktop Computer Price

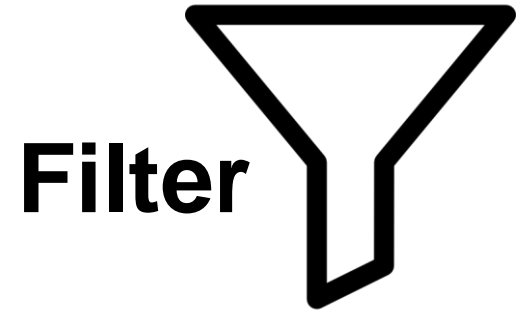
Under \$500

\$500 to \$600

\$600 to \$800

\$800 to \$1000

\$1000 & Above



After we applied filter...

over 2,000 results for "Dell Computer" between \$500 and \$1000





Dell OptiPlex 3000 3080 C GHz - 8 GB RAM DDR4 SDI

5.0 ★★★★★ (16)

Save 7%

\$590⁹⁹ Was: \$635.98

Lowest price in 30 days

FREE delivery **Mar 17 - 21**

Only 3 left in stock - order soon.

More Buying Choices

\$449.99 (20 used & new offers)



Dell OptiPlex 7060 Window M.2 SSD,Built-in Wi-Fi 6e /

4.0 ★★★★★ (1)

\$535⁶⁰

FREE delivery **Wed, Mar 15**

Only 9 left in stock - order soon.

More Buying Choices

\$535.58 (4 new offers)



Dell Vostro 3888 Business 16GB DDR4 RAM, 512GB

2.9 ★★★★★ (3)

\$929⁰⁰

FREE delivery **Mar 10 - 14**

Only 2 left in stock - order soon



Sponsored ⓘ

Dell 2023 Newest Inspiron HDD, Intel UHD Graphics

5.0 ★★★★★ (2)

\$999⁹⁹

FREE delivery **Mar 13 - 16**

Or fastest delivery **Mar 9 - 13**



Many of them have not enough reviews

Sort by Reviews



Featured

Price: Low to High

Price: High to Low

Avg. Customer Review

Newest Arrivals



Dell New Inspiron i3583 15.6" HD
10 - Wireless-AC - Bluetooth - SD

4.6 ★★★★★ (858)

\$537⁹⁹

FREE delivery **Mar 10 - 13**

Or fastest delivery **Thu, Mar 9**

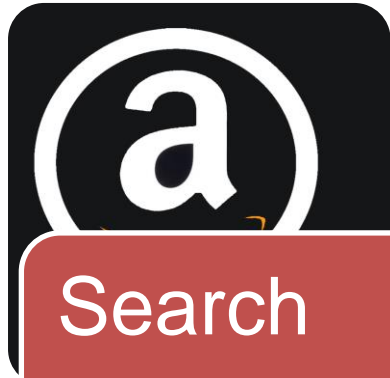
Only 9 left in stock - order soon.

More Buying Choices

\$319.00 (14 used & new offers)



Search for a product



Search

- Keyword
- Dell Desktop



Filter

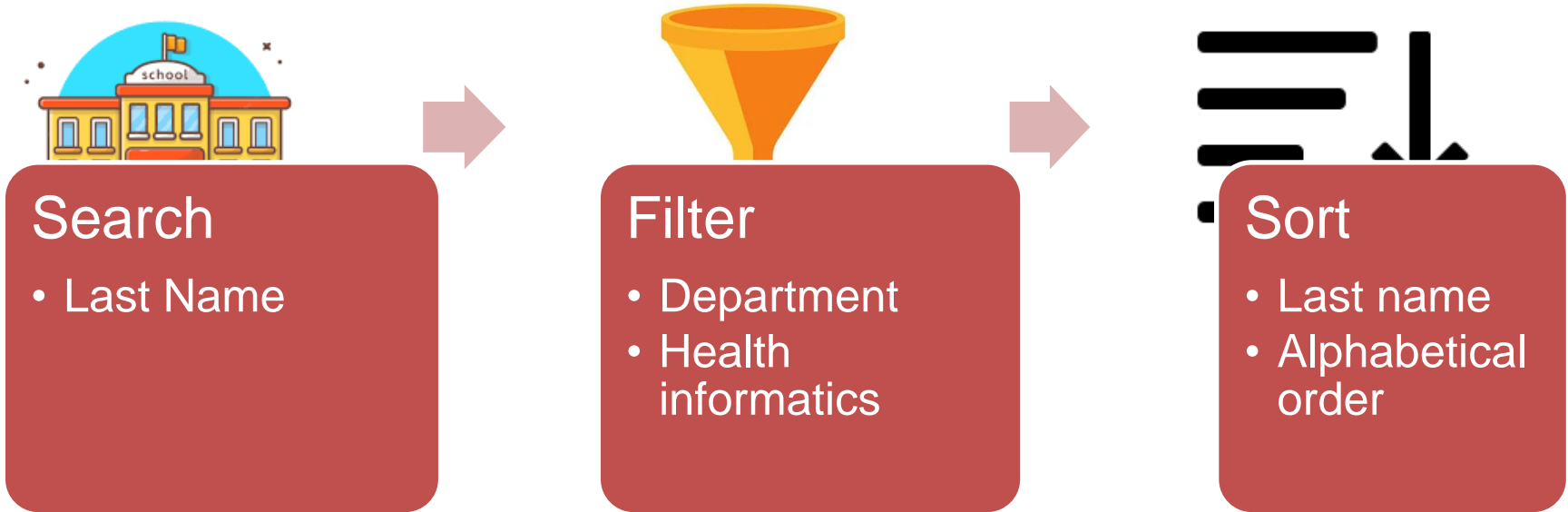
- Price
- \$500-\$1,000



Sort

- Review
- Best first

Search in a employee database



Summary – Descriptive Search

1. Descriptive parts:
2. Finding something you need
3. Excel is providing a toolbox to facilitate your search



Descriptive: Search for some **[Data]** you need

Before placing the order...

1. What else do you need to check?
 - Review
 - Price history

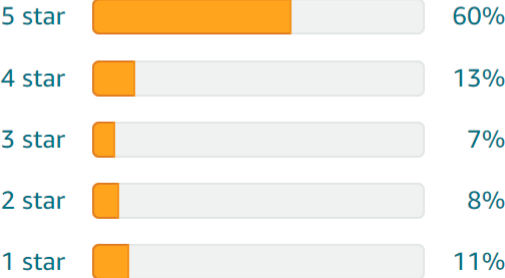


Review

Customer reviews

★★★★☆ 4 out of 5

47 global ratings



Ratings	percentage
5 star	60%
4 star	13%
3 star	7%
2 star	8%
1 star	11%

Summative Table



Ratings	percentage
5 star	60%
4 star	13%
3 star	7%
2 star	8%
1 star	11%

Summative Table

	A	B	C
1	Customer	Ratings	Review comments
2		1 4 star	I ordered the AMD 8GB RAM 256...
3		2 3 star	I am happy with the graphics and ...
4		3 5 star	I ordered this laptop for my son to...
5		4 5 star	Works well except the sound went...
6		5 4 star	Laptop is fast, very nice resolution...
7		6 3 star	Laptop with a high speed processor ...
8	
9	100	5 star	hardware is amazing for the price...
10			

Descriptive Spreadsheet



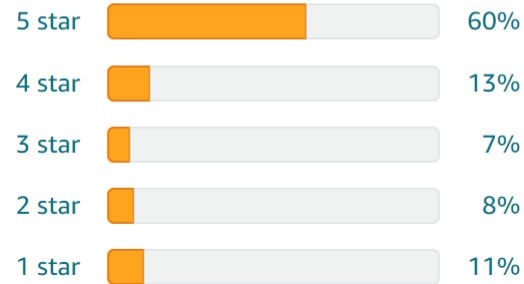
Customer reviews

1. The [average] ratings for all independent customers
 - Summarized data
 - Combined with multiple descriptive records
 - Why we use this: Easy to evaluate the products quality

Customer reviews

★★★★☆ 4 out of 5

47 global ratings



Price History

Price History beta



Last 6 months

	Price	Date
Current	\$299	May 11, 2020
Highest*	\$349	Jan 1, 2020
Lowest*	\$279	Dec 4, 2019
Average	\$325	

* Highest/Lowest price found on Amazon in the last 120 days.



Price History

1. The chart shows product prices and changes in a line chart
 - Summarized data
 - Combined with multiple records
 - Why we use this: Buy the product at lower price

	Price	Date
Last 6 months		
Current	\$299	May 11, 2020
Highest*	\$349	Jan 1, 2020
Lowest*	\$279	Dec 4, 2019
Average	\$325	



How to make these charts?

1. Microsoft Excel
2. Pivot table vs Chart maker



How do we translate then in Healthcare industry?

1. Assignment – In-class example
2. Scenario: Data analysis from a employee ratings report
 - What conclusions you'll be able to make?

