# Introduction to Data Visualization

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# Profile

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**Visualizing information can give us a very quick solution to problems**

**- David McCandless**

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# What is Data Visualization?

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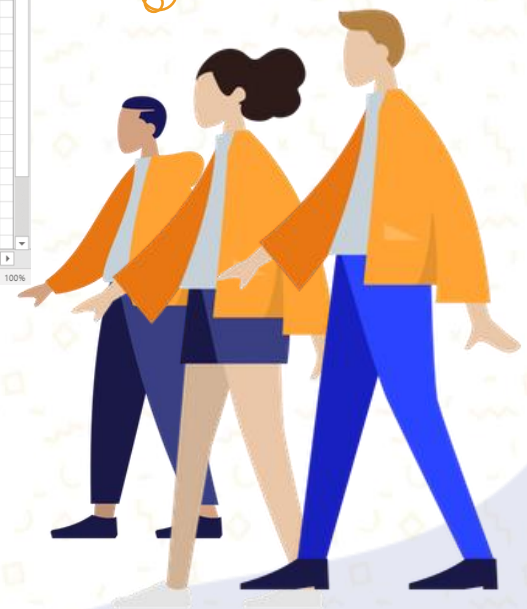
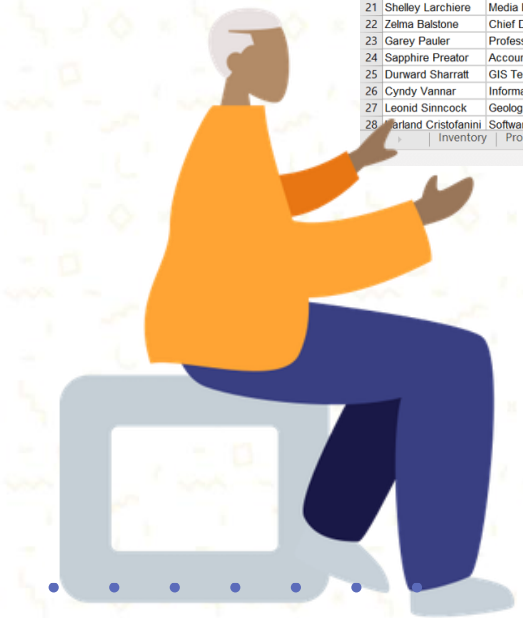
Excel to App Example Spreadsheet - Saved

| | Name | Title | Department | Office Address | Start Date | Email | Phone | Birthday | Image |
|---|---|---|---|---|---|---|---|---|---|
| 2 | Emanuele Garner | Research Nurse | Services | Bellevue, WA, 98004 | 5/18/2017 | egarner0@alexa.com | 942-493-2803 | 11/18/1994 | https://randomuser.me/api/portraits/men/89.jpg |
| 3 | Nicolina Tall | Health Coach IV | Research and Develc | Bellevue, WA, 98004 | 8/7/2018 | ntall1@pbs.org | 776-430-4577 | 10/2/1995 | https://randomuser.me/api/portraits/women/70.jpg |
| 4 | Adrianne Leyborne | Recruiter | Legal | Bellevue, WA, 98004 | 12/28/2017 | aleyborne2@wsj.com | 801-682-6424 | 7/6/1976 | https://randomuser.me/api/portraits/women/45.jpg |
| 5 | Tanner Casino | GIS Technical Architect | Business Developmer | Bellevue, WA, 98004 | 7/5/2016 | tcasino3@narod.ru | 293-662-7062 | 1/30/1967 | https://randomuser.me/api/portraits/men/8.jpg |
| 6 | Minnie Quilliam | Developer I | Legal | Bellevue, WA, 98004 | 11/4/2017 | mquilliam4@walmart.com | 853-234-0775 | 7/23/1987 | https://randomuser.me/api/portraits/women/17.jpg |
| 7 | Sawyer Livingstone | Administrative Officer | Business Developmer | Bellevue, WA, 98004 | 12/1/2018 | slivingstone5@guardian.co.uk | 404-572-3261 | 2/9/1979 | https://randomuser.me/api/portraits/men/90.jpg |
| 8 | Ursula Wanklin | Analog Circuit Design manager | Human Resources | Bellevue, WA, 98004 | 6/7/2017 | uwanklin6@sourceforge.net | 554-320-6015 | 9/27/1963 | https://randomuser.me/api/portraits/women/26.jpg |
| 9 | Mora Colling | Software Consultant | Human Resources | Bellevue, WA, 98004 | 8/25/2017 | mcolling7@addtoany.com | 591-829-4654 | 6/15/1970 | https://randomuser.me/api/portraits/women/63.jpg |
| 10 | Lonny Lynnett | Junior Executive | Engineering | Bellevue, WA, 98004 | 1/4/2017 | llynnett8@smugmug.com | 857-812-8268 | 8/27/1967 | https://randomuser.me/api/portraits/women/7.jpg |
| 11 | Bartlet Lamps | VP Sales | Marketing | Bellevue, WA, 98004 | 5/29/2017 | blamps9@tripadvisor.com | 620-546-4759 | 9/3/1982 | https://randomuser.me/api/portraits/women/64.jpg |
| 12 | Alard Kobu | Geologist I | Sales | Bellevue, WA, 98004 | 3/13/2018 | akobua@rambler.ru | 304-195-3878 | 11/17/1976 | https://randomuser.me/api/portraits/men/40.jpg |
| 13 | Sylvester Shreeves | Biostatistician IV | Legal | Bellevue, WA, 98004 | 7/11/2016 | sshreevesb@tiny.cc | 735-996-5448 | 12/10/1961 | https://randomuser.me/api/portraits/men/80.jpg |
| 14 | Brod Morsley | Research Associate | Business Developmer | Bellevue, WA, 98004 | 3/15/2019 | bmorsleyc@tinypic.com | 928-783-5846 | 8/28/1987 | https://randomuser.me/api/portraits/men/10.jpg |
| 15 | Costanza Fayter | Systems Administrator III | Services | Bellevue, WA, 98004 | 3/7/2018 | cfayterd@bloglines.com | 285-245-3025 | 12/31/1983 | https://randomuser.me/api/portraits/men/54.jpg |
| 16 | Sorcha Eisikowitch | Executive Secretary | Legal | Seattle, WA, 98109 | 6/15/2017 | seisikowitche@miibeian.gov.cn | 196-513-8975 | 3/4/1995 | https://randomuser.me/api/portraits/women/67.jpg |
| 17 | Hanni Llewellin | Senior Financial Analyst | Marketing | Seattle, WA, 98109 | 2/2/2017 | hllewellinf@cyberchimps.com | 565-680-1720 | 1/29/1989 | https://randomuser.me/api/portraits/women/51.jpg |
| 18 | Arlene Shoesmith | Paralegal | Legal | Seattle, WA, 98109 | 12/11/2016 | ashoesmithg@wordpress.org | 666-256-9424 | 5/22/1967 | https://randomuser.me/api/portraits/women/42.jpg |
| 19 | Ingamar D'Andrea | Developer IV | Research and Develc | Seattle, WA, 98109 | 4/5/2018 | idandreah@ibm.com | 554-819-6509 | 12/17/1979 | https://randomuser.me/api/portraits/men/38.jpg |
| 20 | Hadria Gut | Social Worker | Accounting | Seattle, WA, 98109 | 8/27/2017 | hguti@nifty.com | 185-927-0435 | 7/16/1976 | https://randomuser.me/api/portraits/women/50.jpg |
| 21 | Shelley Larchiere | Media Manager IV | Services | Seattle, WA, 98109 | 4/13/2019 | slarchierej@va.gov | 471-825-8911 | 10/14/1984 | https://randomuser.me/api/portraits/women/22.jpg |
| 22 | Zelma Balstone | Chief Design Engineer | Product Management | Seattle, WA, 98109 | 12/25/2017 | zbalstonek@ycombinator.com | 443-596-4137 | 5/15/1976 | https://randomuser.me/api/portraits/women/3.jpg |
| 23 | Garey Pauler | Professor | Support | Seattle, WA, 98109 | 1/8/2017 | gpaulerl@narod.ru | 646-921-0513 | 10/25/1970 | https://randomuser.me/api/portraits/men/76.jpg |
| 24 | Sapphire Preator | Account Representative IV | Business Developmer | Seattle, WA, 98109 | 10/10/2018 | spreatorm@amazon.de | 957-743-3403 | 5/10/1984 | https://randomuser.me/api/portraits/women/23.jpg |
| 25 | Durward Sharratt | GIS Technical Architect | Sales | Seattle, WA, 98109 | 8/17/2018 | dsharrattn@myspace.com | 255-547-0260 | 5/25/1973 | https://randomuser.me/api/portraits/men/28.jpg |
| 26 | Cyndy Vannar | Information Systems Manager | Accounting | Seattle, WA, 98109 | 10/25/2017 | cvannaro@dmoz.org | 733-905-2393 | 8/11/1997 | https://randomuser.me/api/portraits/women/9.jpg |
| 27 | Leonid Sinncock | Geologist IV | Support | Seattle, WA, 98109 | 4/11/2019 | lsinncockp@yale.edu | 428-564-7468 | 6/28/1983 | https://randomuser.me/api/portraits/men/57.jpg |
| 28 | Harland Cristofanini | Software Test Engineer II | Engineering | Seattle, WA, 98109 | 7/13/2016 | hcristofaniniq@sciencedaily.com | 724-847-6747 | 6/15/1973 | https://randomuser.me/api/portraits/men/48.jpg |



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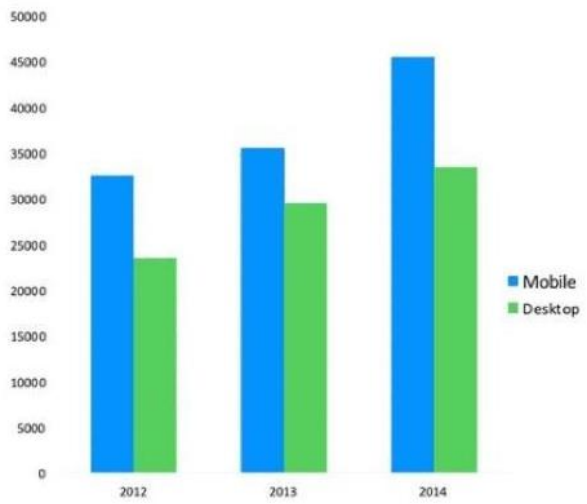
Desktop vs Mobile:

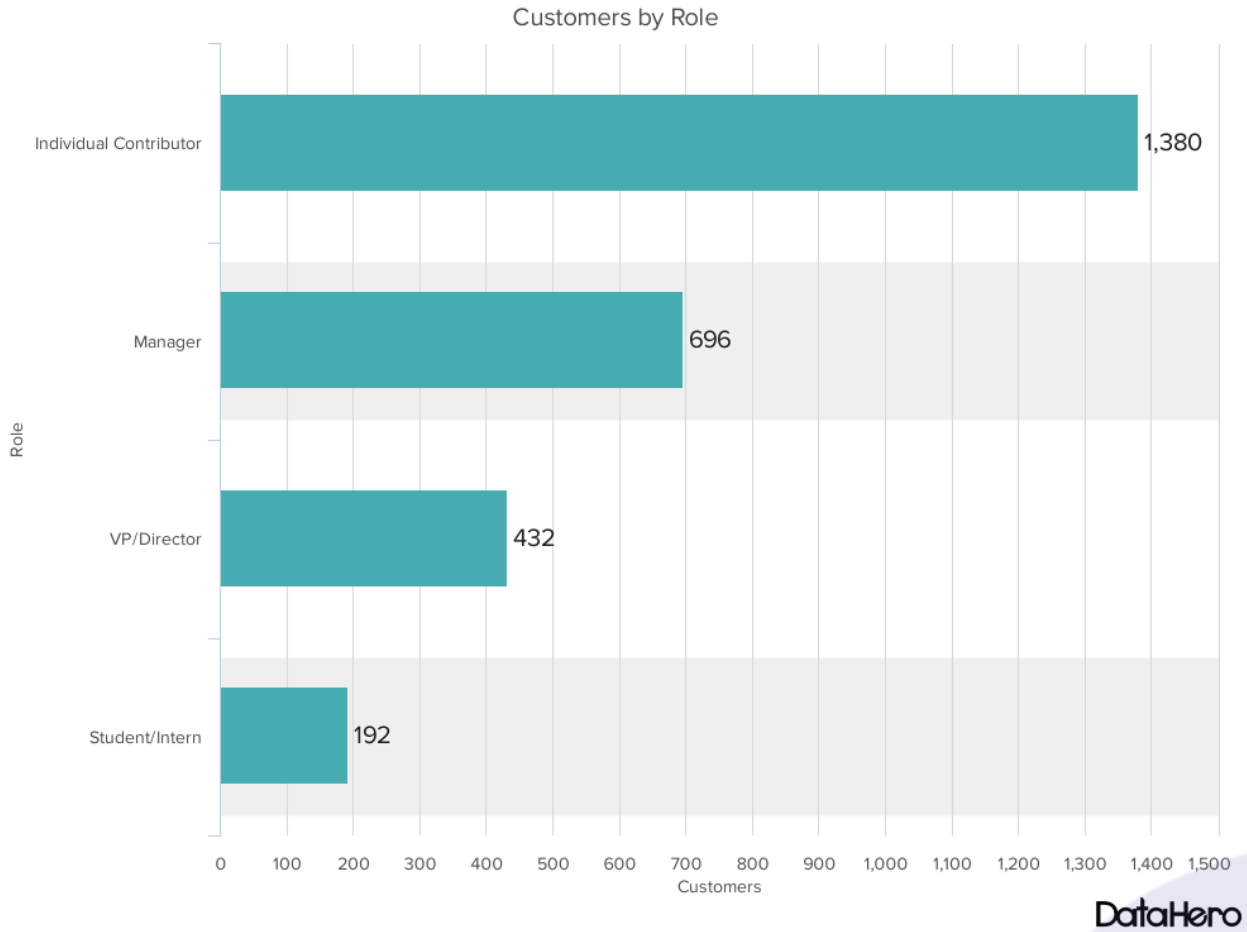


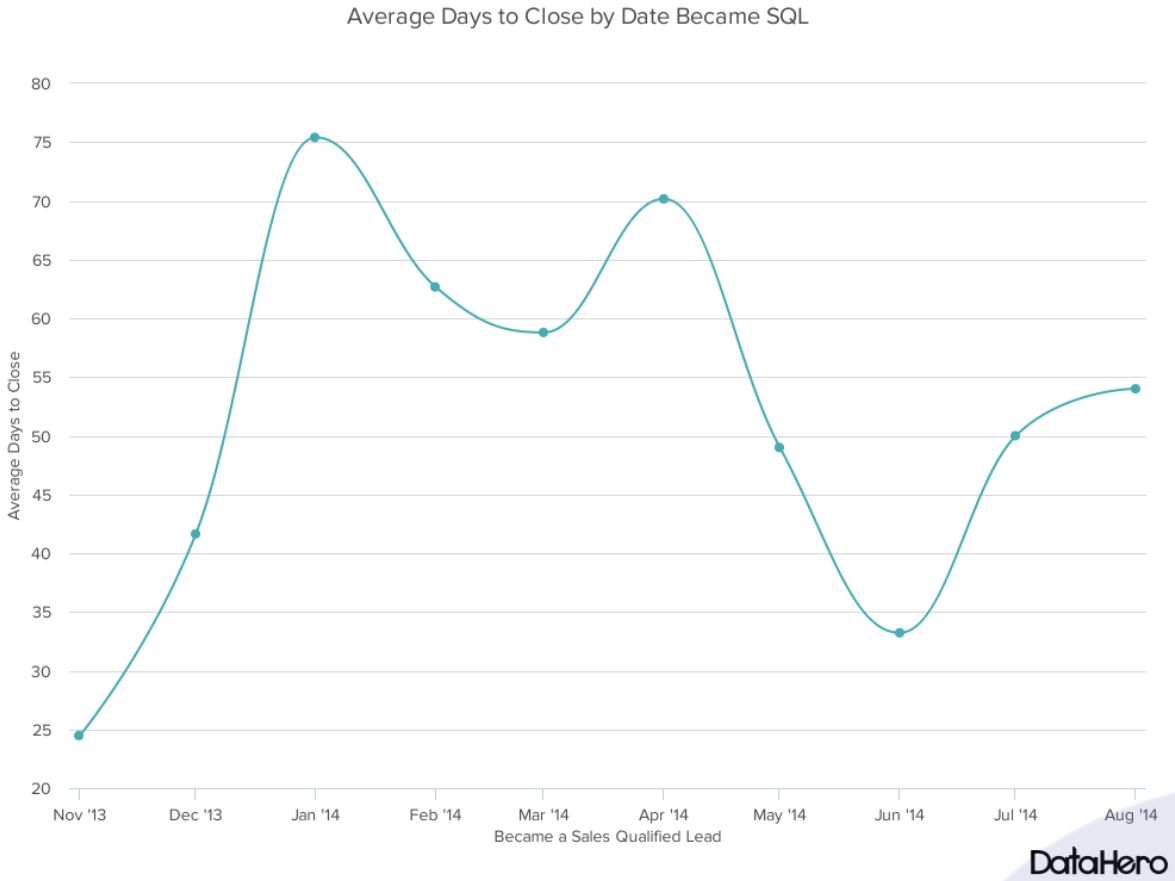

Percentage:

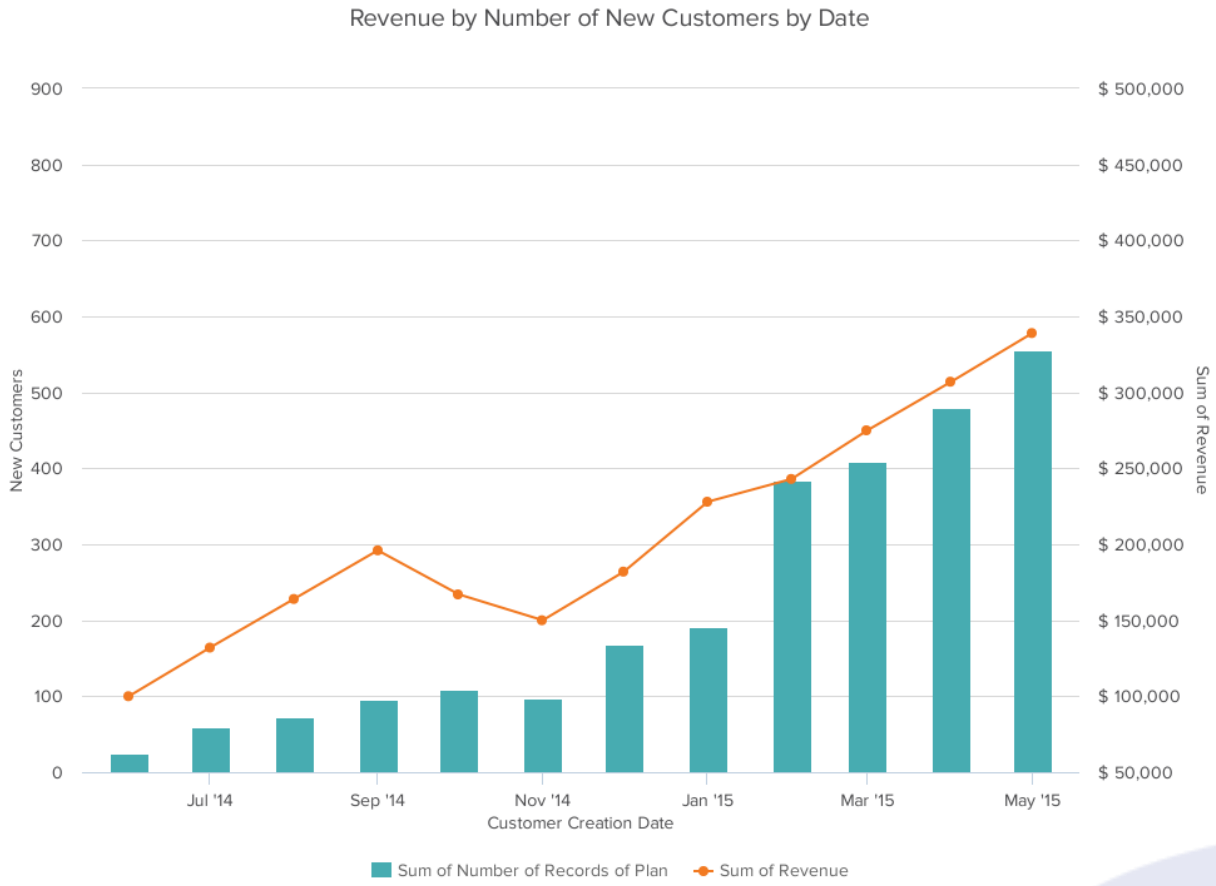

Growth:

**10905**
VISITORS

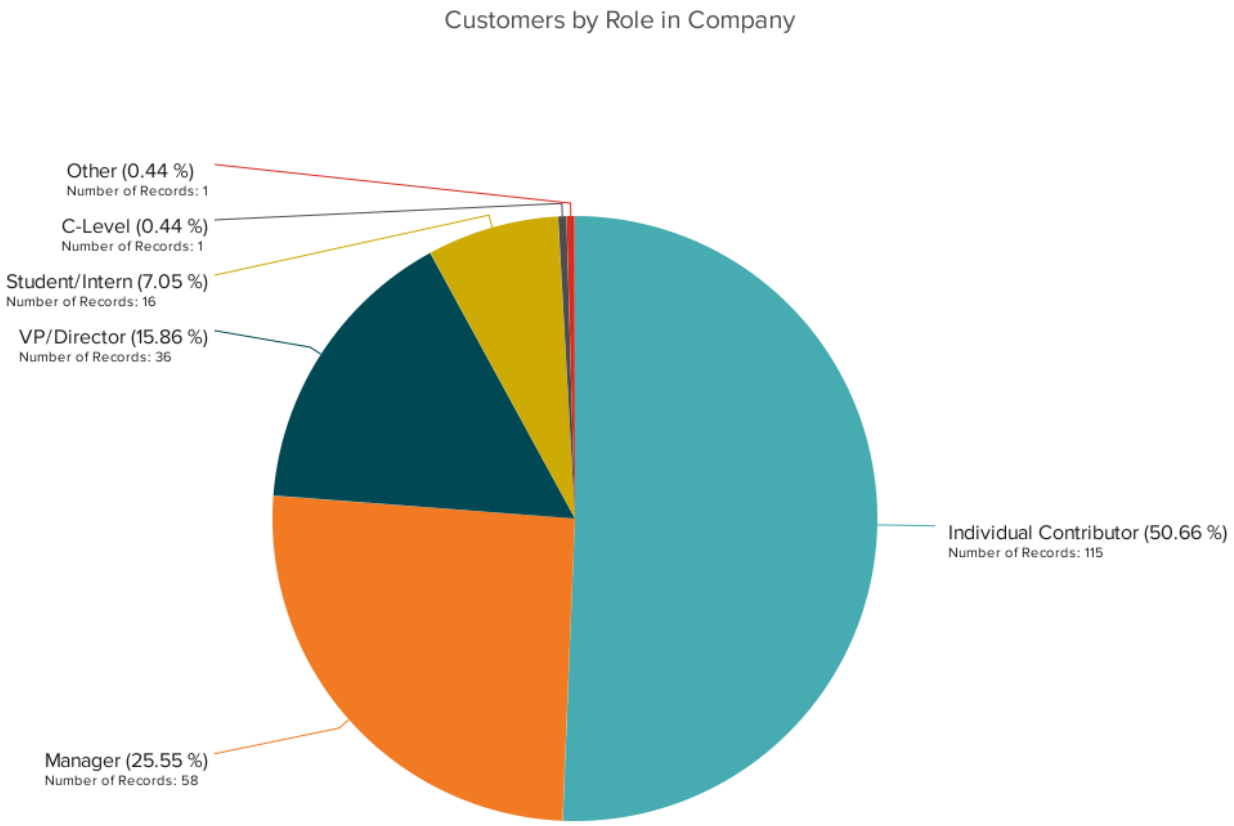
| | 2012 | 2013 | 2014 |
|---|---|---|---|
| Desktop | 23424 | 29424 | 33424 |








DataHero




DataHero

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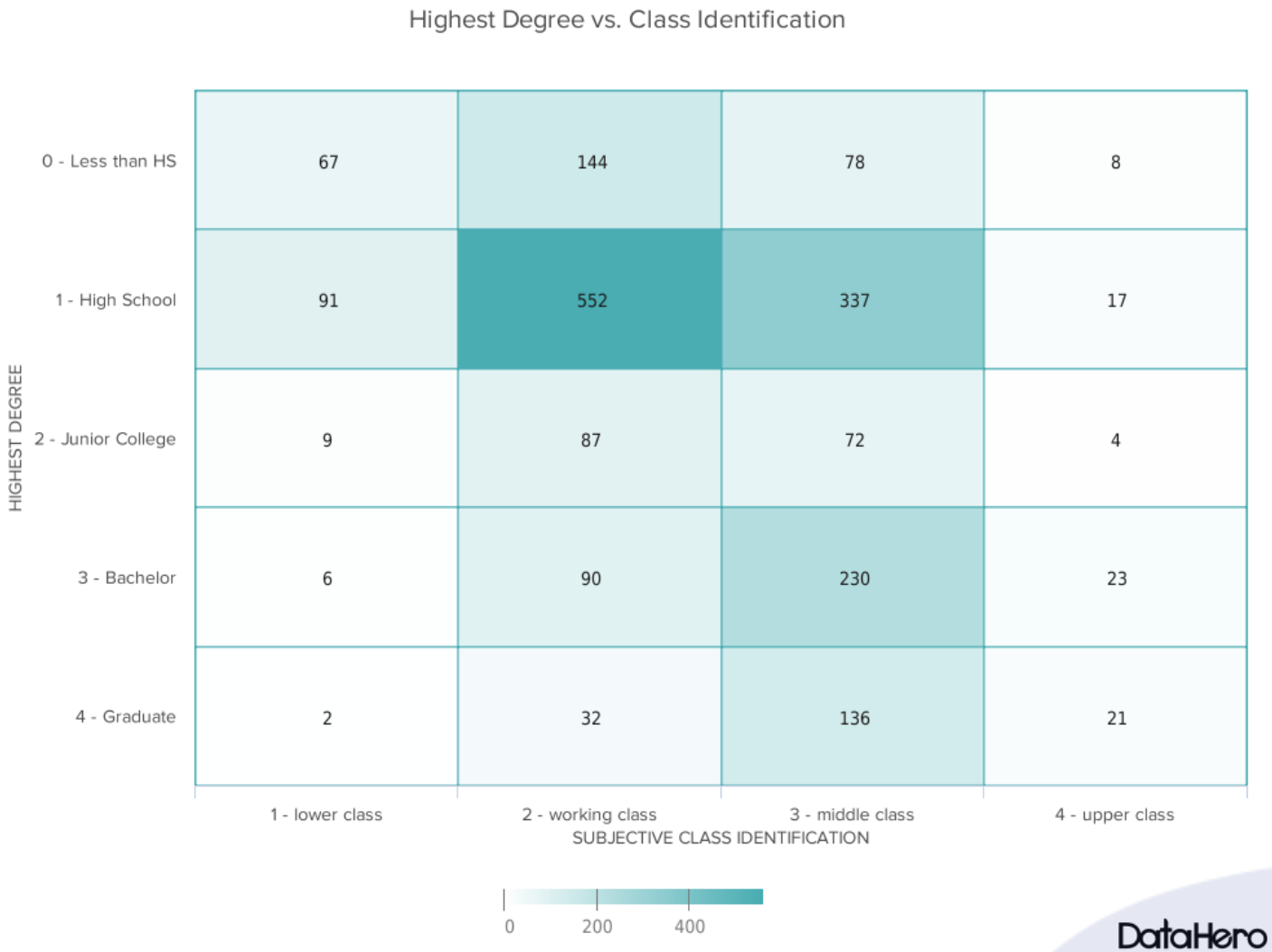
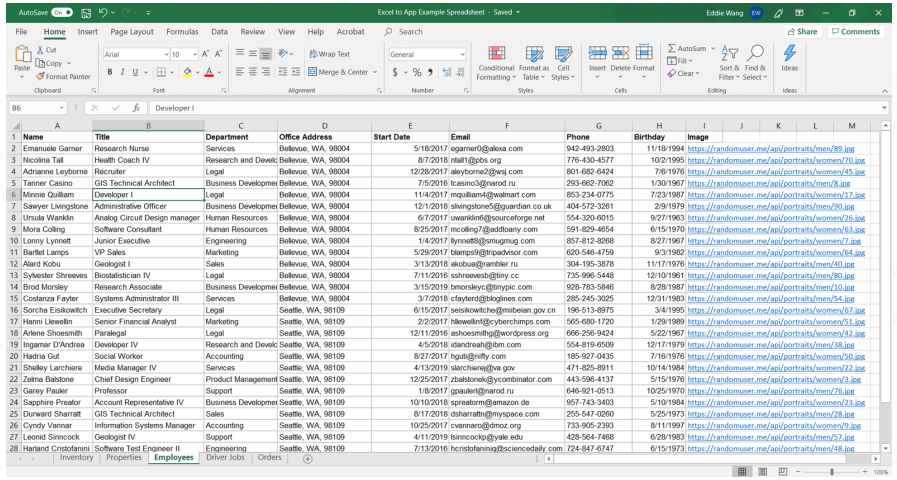
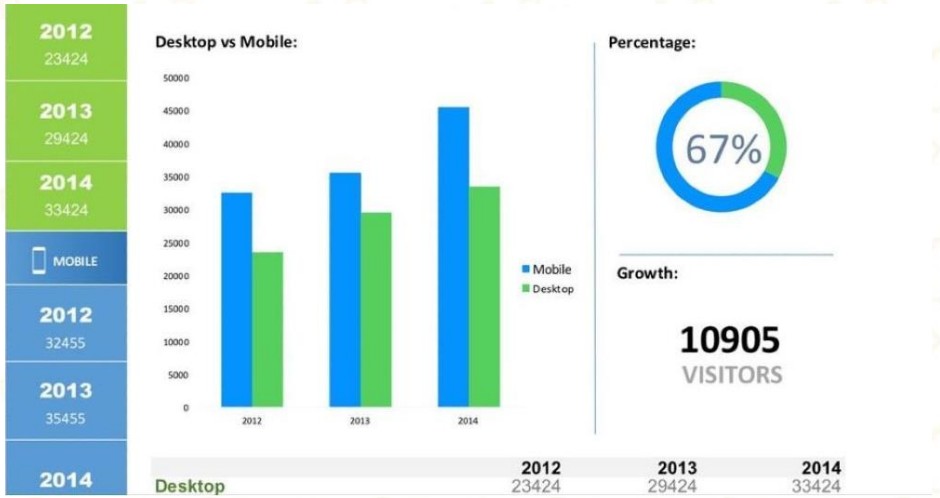



DataHero

# What is Data Visualization?






Tampilan berupa grafis atau visual dari informasi dan data.

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# Why we need Data Visualization

# Why we need Data Visualization

1. Untuk Data Scientist

- Memudahkan dalam memahami data yang sedang dikerjakan

  Contoh : dalam proses Exploratory Data Analysis (EDA)

- Memudahkan dalam membagikan hasil analisis

  Contoh : mempresentasikan analisis penjualan dalam bentuk line chart

# Why we need Data Visualization

2. Untuk Stakeholder

- Memudahkan dalam memahami data
- Memberikan ringkasan singkat tentang isi data
- Membantu pengambilan keputusan yang tepat dan akurat

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# Which chart to use?

# Which Chart to use?

Dalam merepresentasikan data yang kita miliki, kita perlu memilih jenis chart atau grafik yang tepat.

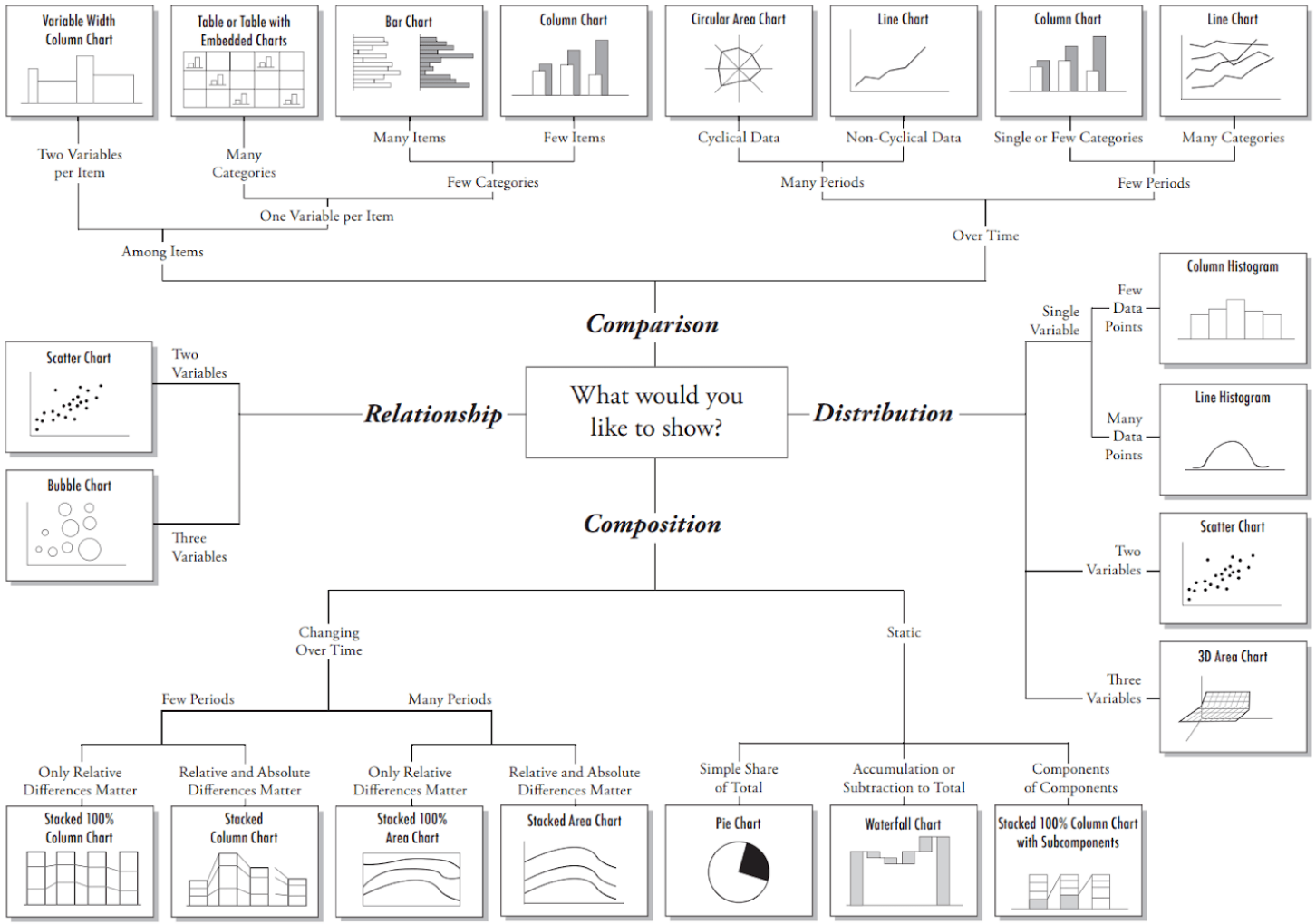
A. Do you want to **compare** values?

B. Do you want to show the **composition** of something?

C. Do you want to understand the **distribution** of your data?

D. Do you want to better understand the **relationship** between value sets?

# Chart Suggestions—A Thought-Starter



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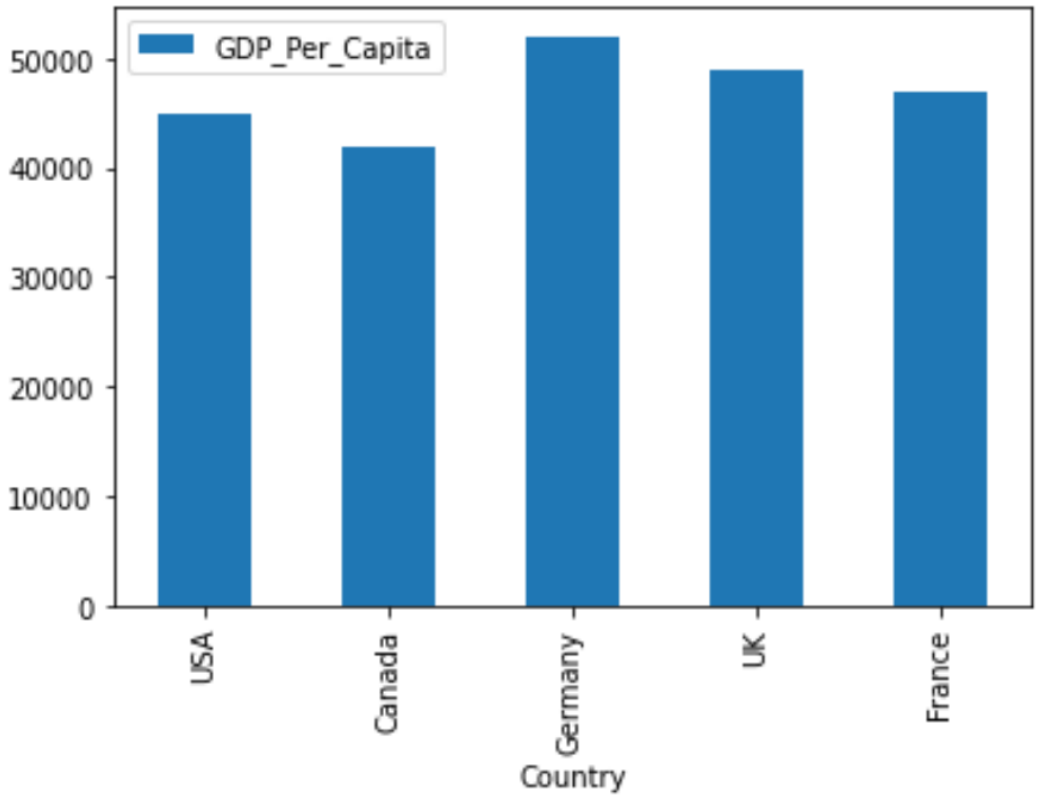
# Data Visualization in Python

# Bar Chart

```
df_3.plot(x ='Country', y='GDP_Per_Capita', kind = 'bar')
```

```
<matplotlib.axes._subplots.AxesSubplot at 0x7ffa7df49290>
```



# Line Chart

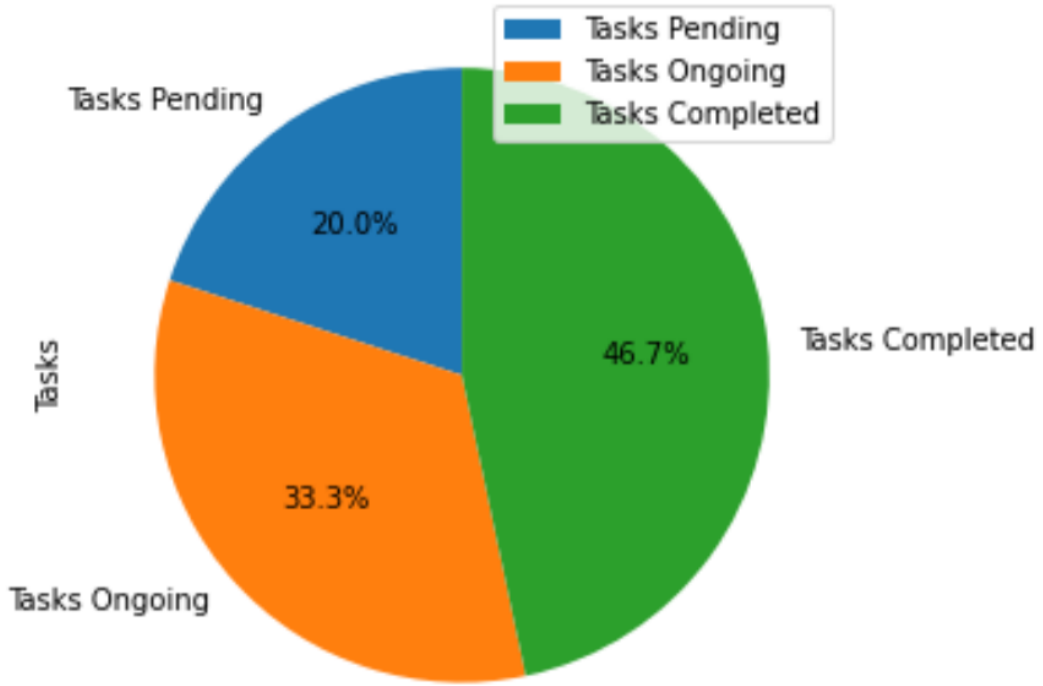
```
df_2_sort.plot(x ='Year', y='Unemployment_Rate', kind = 'line')
```

```
<matplotlib.axes._subplots.AxesSubplot at 0x7ffa7dfc0c90>
```

# Pie Chart

```
df_4.plot.pie(y='Tasks',figsize=(5, 5),autopct='%1.1f%%', startangle=90)
```

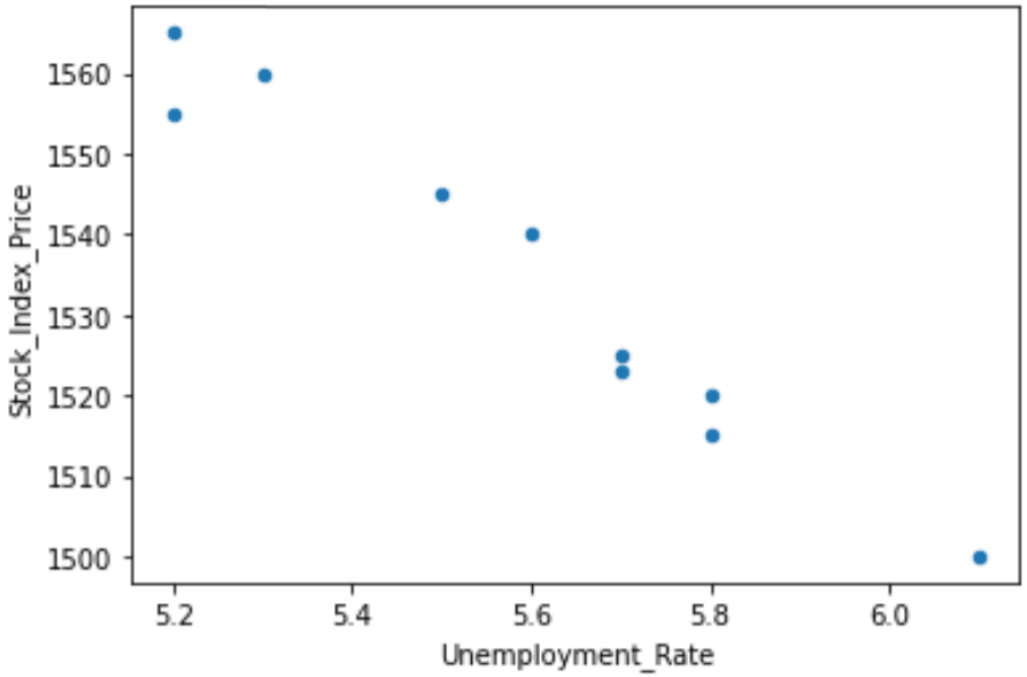
```
<matplotlib.axes._subplots.AxesSubplot at 0x7ffa7d36b310>
```



# Scatter Plot

```
df_1.plot(x ='Unemployment_Rate', y='Stock_Index_Price', kind = 'scatter')
```

```
<matplotlib.axes._subplots.AxesSubplot at 0x7ffa8848bbd0>
```



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# Keep practicing

# in your Google Colab!

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# BONUS !

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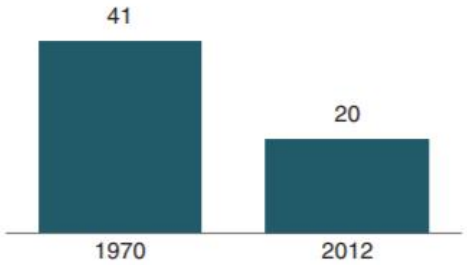
# Level Up in Data Visualization

## Children with a "Traditional" Stay-at-Home Mother

*% of children with a married stay-at-home mother with a working husband*




Note: Based on children younger than 18. Their mothers are categorized based on employment status in 1970 and 2012.

Source: Pew Research Center analysis of March Current Population Surveys Integrated Public Use Microdata Series (IPUMS-CPS), 1971 and 2013

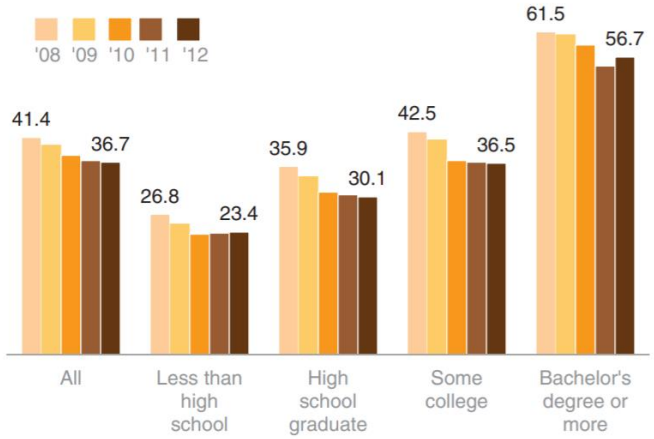
Adapted from PEW RESEARCH CENTER

# 20%

of children had a **traditional stay-at-home mom** in 2012, compared to 41% in 1970

## New Marriage Rate by Education

*Number of newly married adults per 1,000 marriage eligible adults*



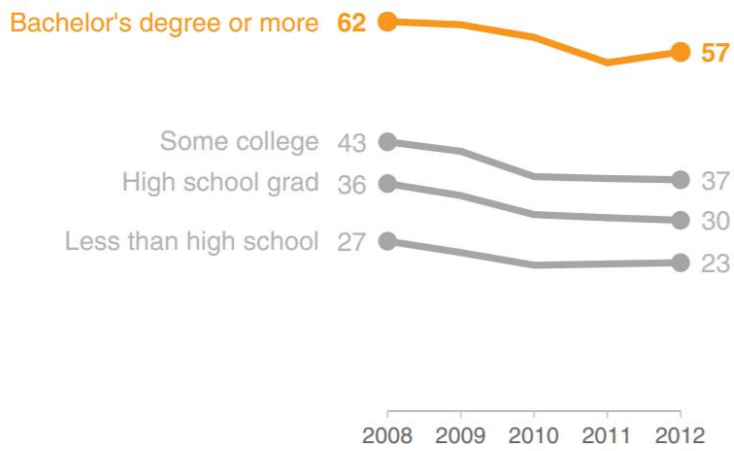

Note: Marriage eligible includes the newly married plus those widowed, divorced, or never married at interview.

Source: U.S. Census

Adapted from **PEW RESEARCH CENTER**

## New marriage rate by education

Number of newly married adults per 1,000 marriage eligible adults




Note: Marriage eligible includes the newly married plus those widowed, divorced, or never married at interview.

Source: U.S. Census

Adapted from PEW RESEARCH CENTER

## Table

| | A | B | C |
|---|---|---|---|
| Category 1 | 15% | 22% | 42% |
| Category 2 | 40% | 36% | 20% |
| Category 3 | 35% | 17% | 34% |
| Category 4 | 30% | 29% | 26% |
| Category 5 | 55% | 30% | 58% |
| Category 6 | 11% | 25% | 49% |

## Heatmap

LOW-**HIGH**

| | A | B | C |
|---|---|---|---|
| Category 1 | 15% | 22% | 42% |
| Category 2 | 40% | 36% | 20% |
| Category 3 | 35% | 17% | 34% |
| Category 4 | 30% | 29% | 26% |
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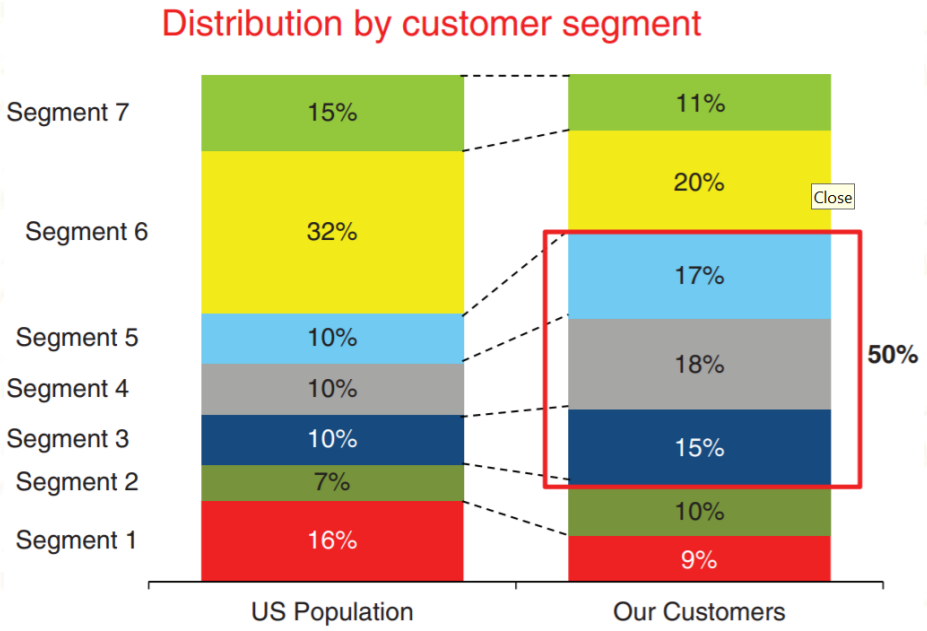


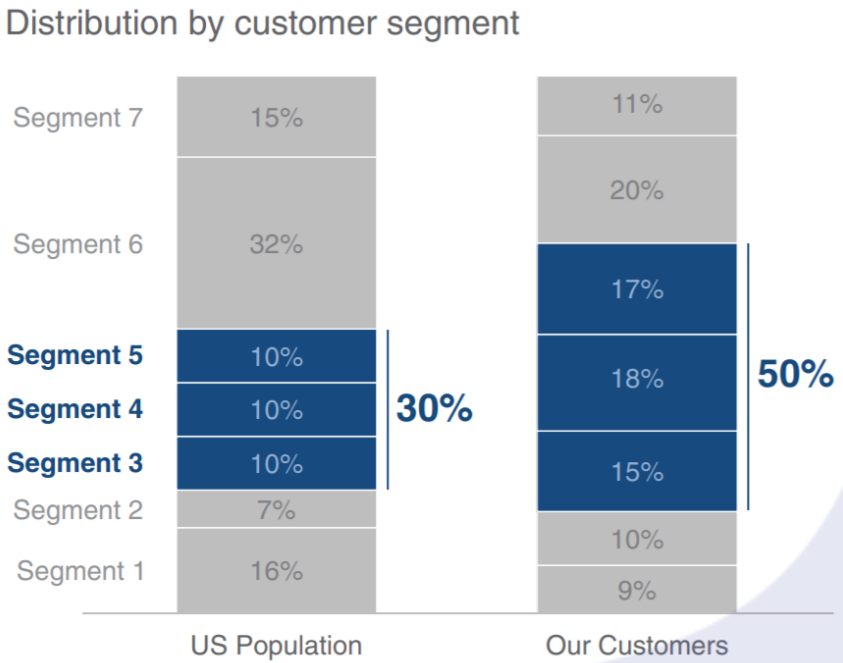

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# Thank You