BHARATIYA VIDYA BHAVAN'S
SARDAR PATEL INSTITUTE OF TECHNOLOGY
(Empowered Autonomous Institute Affiliated to University of Mumbai)

[Knowledge is Nectar]

Advance Data Visualization

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Batch	Batch G
Aim	To effectively visualize and analyze large-scale datasets related to women empowerment and gender participation using Tableau, creating interactive and informative dashboards.

Dataset: Women Empowerment in STEM fields

Examples:

	High schoolor less	Some college	Bachelor's degree	Master's degree	Professional Doctoral degree
Allemployed	41%	0.5	49%	0.54	42%
STEMjobs	55	59	47	47	41
Computer	30	24	24	27	21
Math	57	58	43	46	37
Engineering/architecture	15	11	14	18	14
Lifescience	45	43	48	55	41
Physicalscience	33	33	43	44	32
Health-related	81	83	80	80	45

Ethnicity	All (Dollars)	Men (Dollars)	Women (Dollars)
White	71897	85000	60828
Asian	90000	96311	81011
Bleck	58000	66834	52718
Hispanic	60758	70000	52000

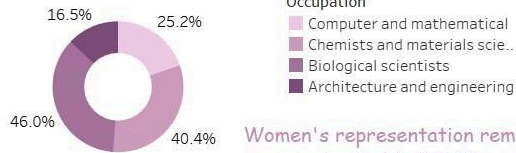| Profession	Men (%)	Women (%)
Health professions major workingin health-relatedjob	61	69
Computer major workingin computers	53	38
Engineering major working in engineering	30	24
Mathmajor working in math	5	5
Lifesciences major workingin lifesciences	5	5
Physicalsciences major workingin physicalsciences	10	8

DASHBOARD:

Women Empowerment in STEM

STEM stands for Science, Technology, Engineering, and Mathematics. This dashboard is intended to make a social change by making the world aware of the backwardness of women in the STEM fields. The dashboard includes data up to 2015 on.
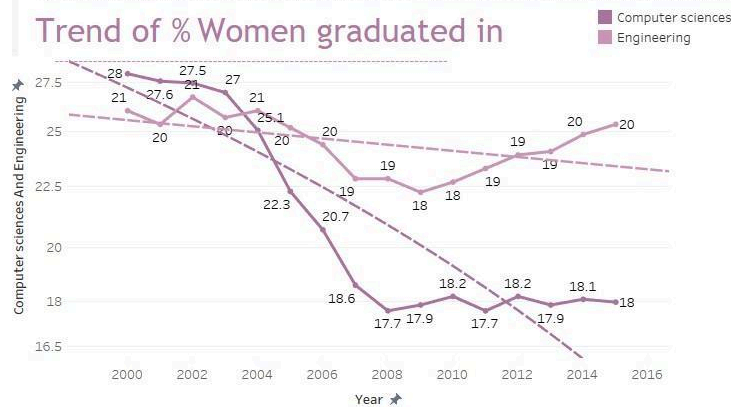
Women % in various field

Occupation
- Computer and mathematical
- Chemists and materials scie..
- Biological scientists
- Architecture and engineering

16.5% 25.2%
46.0% 40.4%

This pie chart shows about the percentage of women working in various STEM related fields. Here we can see

Women's representation remains low in computer/math and engineering fields (25.2% and 16.5% respectively), while biological science (46.0%) and chemistry/materials science (40.4%) show more balanced trends."

Trend of % Women graduated in

Legend:
- Computer sciences
- Engineering

Y-axis: Computer sciences And Engineering
X-axis: Year

Data points: 28, 21, 27.6, 20, 27.5, 21, 27, 21, 25.1, 20, 22.3, 20, 20.7, 20, 18.6, 19, 17.7, 18, 17.9, 19, 18.2, 18, 17.7, 19, 18.2, 19, 17.9, 20, 18.1, 20, 18

Years: 2000, 2002, 2004, 2006, 2008, 2010, 2012, 2014, 2016

The % of women are graduating from stem majors by 2015 ⓘ

Computer science : **18**
Engineering : **20.1**

Over the years from **2000 to 2015**, the average scores in Computer Sciences gradually declined from **28.0 to 18.0**, while Engineering scores remained relatively stable, ranging from **20.5 to 20.1**.

The % of women are in stem jobs by education in field Like ..
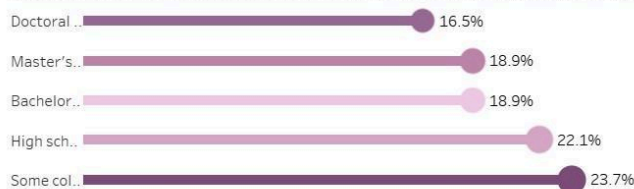
- Doctoral .. — 16.5%
- Master's.. — 18.9%
- Bachelor.. — 18.9%
- High sch.. — 22.1%
- Some col.. — 23.7%

The **% of women** in **health-related** jobs with their **master's education** and **Professional/Doctoⓘgree.**

The **% of Women** in **Health-related jobs** with their **Master's education** is **21.67%**

The **% of Women** in **Health-related jobs** with their **Professional or Doctoral Degree** is **12.20%**

The % of Women are wor ⓘ in

The **% of women** working in **computers** who majored in Computers is **25.50%**

The **% of women** working in **Engineering jobs** who majored in engineering is **16.11%**

Men Vs Momen % by Profession

Profession	Men (%)	Women (%)
Health professions maj..	61	69
Computer major worki..	53	38
Engineering major wor..	30	24
Physicalsciences major..	10	8
Mathmajor working in ..	5	5
Lifesciences major wor..	5	5

Comparison of Salaries

Ethnicity

| Asian | Black | Hispanic | White |

100K
80K
60K
40K
20K
0K

Difference in Salary of Asian Men and W ⓘ en is $15,300

Comparison of Salaries

Ethnicity

| Asian | Black | Hispanic | White |

100K
80K
60K
40K
20K
0K

Asian Women have a Salary of 81,011

Difference in Salary of **Asian Men and** W ⓘ **en is $15,300**

Observation:

- **Asian men have the highest average salary:** Among all groups represented, Asian men have the highest average salary.
- **Asian women earn significantly less than Asian men:** The graph highlights a significant gender pay gap within the Asian community, with Asian women earning considerably less than Asian men.
- **White individuals have the second-highest average salary:** Following Asian men, White individuals have the second-highest average salary.

- **Black and Hispanic individuals have lower average salaries:** Compared to Asian and White individuals, Black and Hispanic individuals have lower average salaries.

The % of women are in stem jobs by education in field Like ..
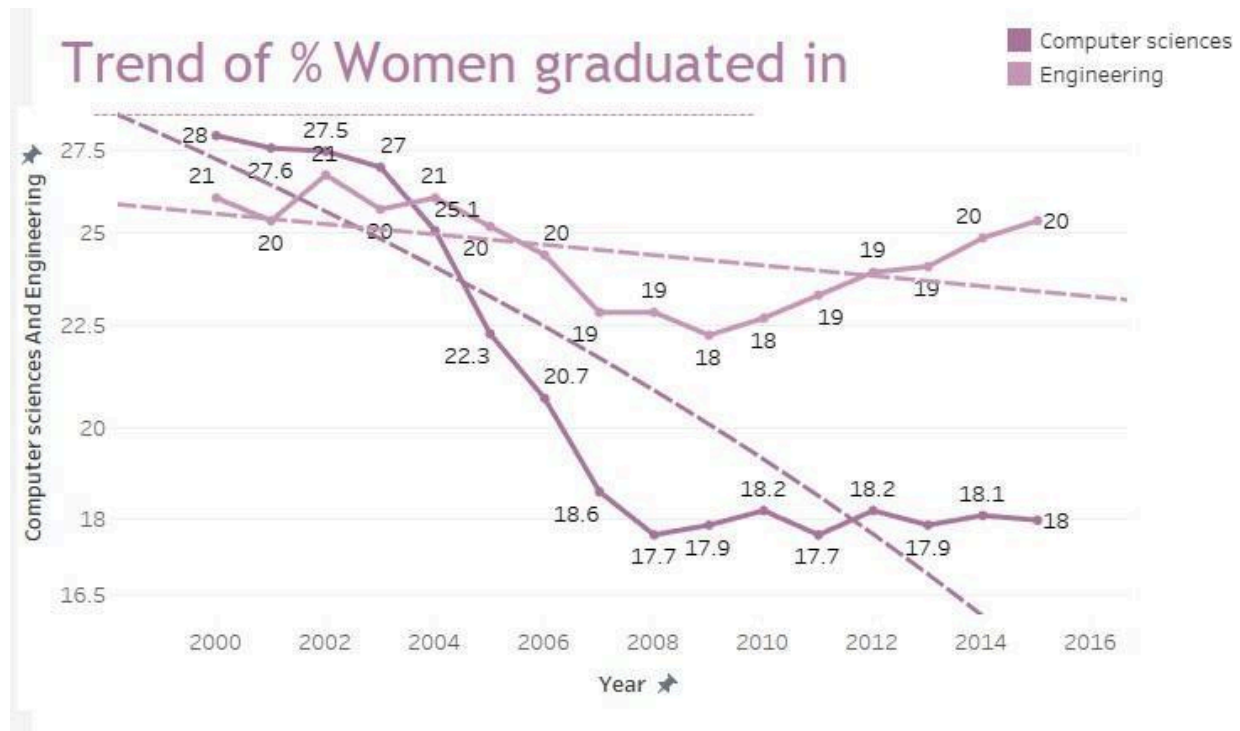
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The % of women in **health-related** jobs with their **master's education** and **Professional/Doctoral** gree.

The **%** of Women in **Health-related jobs** with their **Master's education** is **21.67%**

The **%** of Women in **Health-related jobs** with their **Professional or Doctoral Degree** is **12.20%**

Observation:

- **STEM Jobs:**
  - Women with some college education have the highest representation in STEM.
  - Representation remains relatively consistent across educational levels.
  - Doctoral degrees have the lowest representation for women in STEM.
- **Health-related Jobs:**
  - Master's degrees have the highest representation for women in health-related jobs.
  - A significant drop occurs from master's to professional/doctoral levels.
- **Overall Observations:**
  - Gender gap exists in STEM fields, especially at higher education levels.
  - Higher education leads to greater representation in both fields.
  - Field-specific differences influence women's choices.
- **Possible Explanations:**
  - Stereotypes and biases.
  - Work-life balance challenges.
  - Lack of mentorship and support.
- **Addressing the Gender Gap:**
  - Challenge stereotypes.
  - Improve work-life balance.
  - Increase mentorship and support.
  - Encourage diversity and inclusion.

Trend of % Women graduated in

Legend: Computer sciences, Engineering

X-axis: Year (2000–2016)
Y-axis: Computer sciences And Engineering

Computer sciences data points: 28, 27.6, 27.5, 27, 25.1, 22.3, 20.7, 18.6, 17.7, 17.9, 18.2, 17.7, 18.2, 17.9, 18.1, 18

Engineering data points: 21, 20, 21, 20, 20, 20, 19, 19, 18, 19, 19, 20, 20
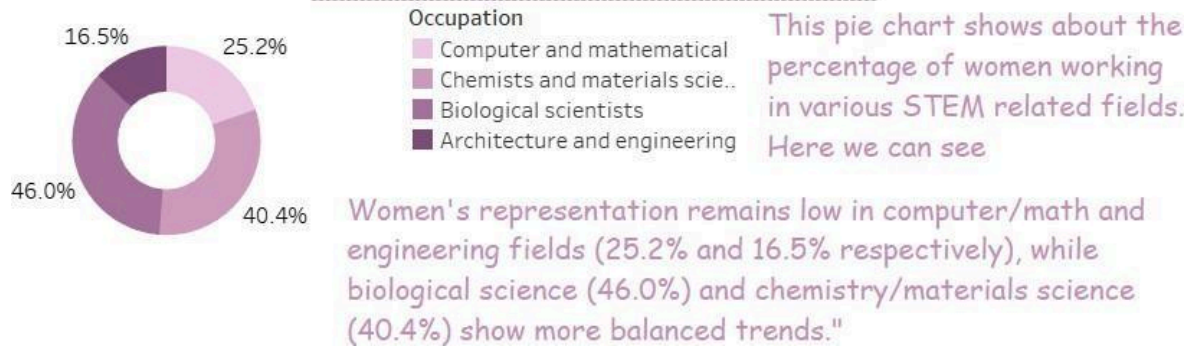
Key observations:

- **Overall decline:** The overall trend for both computer sciences and engineering is a decline in the percentage of women graduates.
- **Computer sciences:** The percentage of women graduating in computer sciences started at a relatively high point in 2000, then declined steadily until 2014, and finally increased slightly in 2016.
- **Engineering:** The percentage of women graduating in engineering also showed a decline from 2000 to 2014, with a more gradual decrease compared to computer sciences. In 2016, the percentage remained relatively stable.
- **Gender gap:** Throughout the period, there has been a consistent gender gap between the percentage of women graduating in computer sciences and engineering compared to men.

Possible explanations for the decline:

- **Stereotypes and biases:** Societal stereotypes and biases about women's abilities in STEM fields may discourage them from pursuing careers in these areas.
- **Lack of mentorship and support:** Women in STEM fields may benefit from having mentors and support networks to help them navigate challenges and advance their careers.
- **Work-life balance:** Balancing work and family responsibilities can be challenging for women in STEM fields, which may lead to them leaving their jobs or choosing less demanding roles.

Women % in various field

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16.5%   25.2%

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Observation:

- **Women's representation in STEM fields varies widely:** While women are well-represented in biological sciences (46.0%) and chemistry/materials science (40.4%), they remain underrepresented in computer/math (25.2%) and engineering (16.5%) fields.
- **Gender gap persists in certain STEM areas:** The significant disparity in women's representation in computer/math and engineering highlights a continuing gender gap in these fields.
- **Positive trends in some fields:** The relatively balanced representation of women in biological sciences and chemistry/materials science indicates positive progress.

CONCLUSION:

This experiment successfully utilized Tableau to create interactive dashboards that analyze large-scale datasets related to women empowerment and gender participation. By effectively visualizing and analyzing key metrics, the dashboards provide valuable insights into trends, disparities, and success stories. The findings can inform policy decisions, guide community initiatives, and contribute to advancing gender equality.