

Chapter1

INTRODUCTION

Data Visualization

Data Sciences - UL 2024-2025

What's this **course** about?

Data visualization

The natural way to **communicate** data

Wealth inequality increasing

Raw data

AMOUNT OF WEALTH PER YEAR AND PERCENTILE

Perc.	1963	1983	1989	1992	1995	1998	2001	2004	2007	2010	2013	2016
1	-6405	-7939	-15151	-18951	-19967	-33773	-29129	-32787	-36200	-88315	-81354	-80620
2	-4430	-3542	-8975	-10985	-11322	-20804	-16041	-17423	-21771	-56902	-54339	-50920
3	-3458	-1932	-6437	-5954	-7360	-12617	-9010	-11065	-12437	-37913	-38615	-34580
4	-2689	-727	-3526	-3807	-4213	-8440	-4918	-6969	-8222	-26959	-25778	-25749
5	-2080	-85	-1586	-1895	-2349	-4426	-2100	-3459	-5327	-17022	-19127	-17300
6	-1514	0	-933	-839	-940	-2375	-677	-1488	-2281	-11882	-13465	-11710
7	-1003	0	-224	-84	-16	-885	0	-216	-892	-7936	-9331	-7998
8	-548	0	0	0	0	0	0	0	0	-4974	-6290	-5170
9	-295	302	0	0	0	0	0	1	0	-2885	-3908	-2818
10	-18	724	0	0	94	0	135	254	35	-1105	-2114	-950
11	6	1219	0	168	501	148	542	1145	359	-66	-691	0
12	6	1661	93	553	1175	472	1192	1908	1100	0	0	60
13	6	1992	373	1140	1724	885	2032	2416	1853	0	1	320
14	6	2415	746	1509	2553	1608	2845	2951	2571	133	206	680
15	160	2873	1120	2012	3461	2287	3658	3561	3474	774	557	1100
16	437	3460	1866	2683	4353	3143	4471	4197	4354	1470	1237	1560
17	794	4023	2146	3254	5481	4131	5419	5062	5362	2211	2011	2350
18	1144	4754	2799	3857	6421	5238	6612	5977	6369	3207	2939	3230
19	1298	5469	3732	4746	7172	6123	7859	6931	7353	3869	3712	4080
20	1821	6293	4105	5920	8143	7259	9213	8228	8488	4753	4434	4800
21	2314	7029	4777	6960	9286	8263	11042	9780	9496	5598	5186	5620
22	2793	7855	5803	8221	10805	9369	12194	11319	11349	6356	6094	6410
23	3156	9176	7277	9516	12215	11066	13725	13036	13028	7140	7094	7651
24	3839	10480	8415	11069	13483	12763	15554	14880	14568	8124	8259	8971

Raw data

Perc.	1963	1983	1989	1992	1995	1998	2001	2004	2007	2010	2013	2016
1	-6405	-7939	-15151	-18951	-19967	-33773	-29129	-32787	-36200	-88315	-81354	-80620
2	-4430	-3542	-8975	-10985	-11322	-20804	-16041	-17423	-21771	-56902	-54339	-50920
3	-3458	-1932	-6437	-5954	-7360	-12617	-9010	-11065	-12437	-37913	-38615	-34580
4	-2689	-727	-3526	-3807	-4213	-8440	-4918	-6969	-8222	-26959	-25778	-25749
5	-2080	-85	-1586	-1895	-2349	-4426	-2100	-3459	-5327	-17022	-19127	-17300
6	-1514	0	-933	-839	-940	-2375	-677	-1488	-2281	-11882	-13465	-11710
7	-1003	0	-224	-84	-16	-885	0	-216	-892	-7936	-9331	-7998
8	-548	0	0	0	0	0	0	0	0	-4974	-6290	-5170
9	-295	302	0	0	0	0	0	1	0	-2885	-3908	-2818
10	-18	724	0	0	94	0	135	254	35	-1105	-2114	-950
11	6	1219	0	168	501	148	542	1145	359	-66	-691	0
12	6	1661	93	553	1175	472	1192	1908	1100	0	0	60
13	6	1992	373	1140	1724	885	2032	2416	1853	0	1	320
14	6	2415	746	1509	2553	1608	2845	2951	2571	133	206	680
15	160	2873	1120	2012	3461	2287	3658	3561	3474	774	557	1100
16	437	3460	1866	2683	4353	3143	4471	4197	4354	1470	1237	1560
17	794	4023	2146	3254	5481	4131	5419	5062	5362	2211	2011	2350
18	1144	4754	2799	3857	6421	5238	6612	5977	6369	3207	2939	3230
19	1298	5469	3732	4746	7172	6123	7859	6931	7353	3869	3712	4080
20	1821	6293	4105	5920	8143	7259	9213	8228	8488	4753	4434	4800
21	2314	7029	4777	6960	9286	8263	11042	9780	9496	5598	5186	5620
22	2793	7855	5803	8221	10805	9369	12194	11319	11349	6356	6094	6410
23	3156	9176	7277	9516	12215	11066	13725	13036	13028	7140	7094	7651
24	3839	10480	8415	11069	13483	12763	15554	14880	14568	8124	8259	8971



Data



Message

Raw data

Perc.	1963	1983	1989	1992	1995	1998	2001	2004	2007	2010	2013	2016
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6	-1514	0	-933	-839	-940	-2375	-677	-1488	-2281	-11882	-13465	-11710
7	-1003	0	-224	-84	-16	-885	0	-216	-892	-7936	-9331	-7998
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12	6	1661	93	553	1175	472	1192	1908	1100	0	0	60
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21	2314	7029	4777	6960	9286	8263	11042	9780	9496	5598	5186	5620
22	2793	7855	5803	8221	10805	9369	12194	11319	11349	6356	6094	6410
23	3156	9176	7277	9516	12215	11066	13725	13036	13028	7140	7094	7651
24	3839	10480	8415	11069	13483	12763	15554	14880	14568	8124	8259	8971



Data



Message

**Communication
fails**

Verbal language

**“Wealth inequality
has risen almost
7 times in the past
50 years”**

Verbal language

**“Wealth inequality
has risen almost
7 times in the past
50 years”**



Message

Verbal language

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Message



Data

Verbal language

**“Wealth inequality
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Message

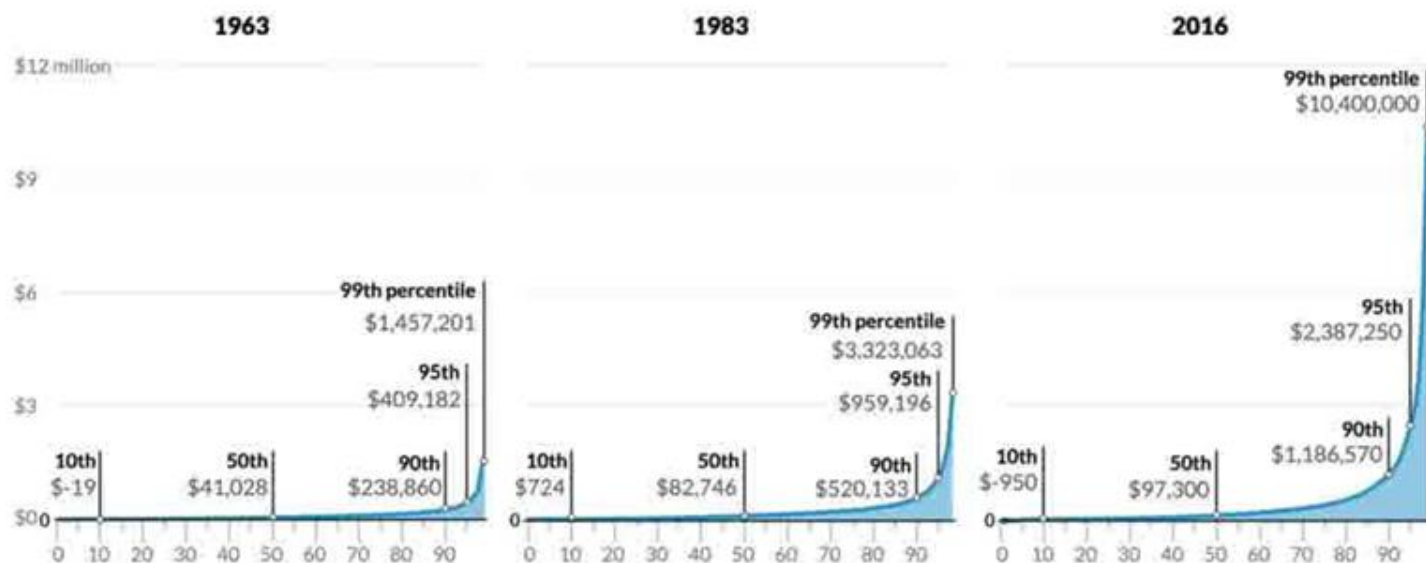


Data

**Communication
fails**

Visual description of the data

Distribution of Family Wealth, 1963-2016



Source: Urban Institute calculations from Survey of Financial Characteristics of Consumers 1962 (December 31), Survey of Changes in Family Finances 1963, and Survey of Consumer Finances 1983-2016.

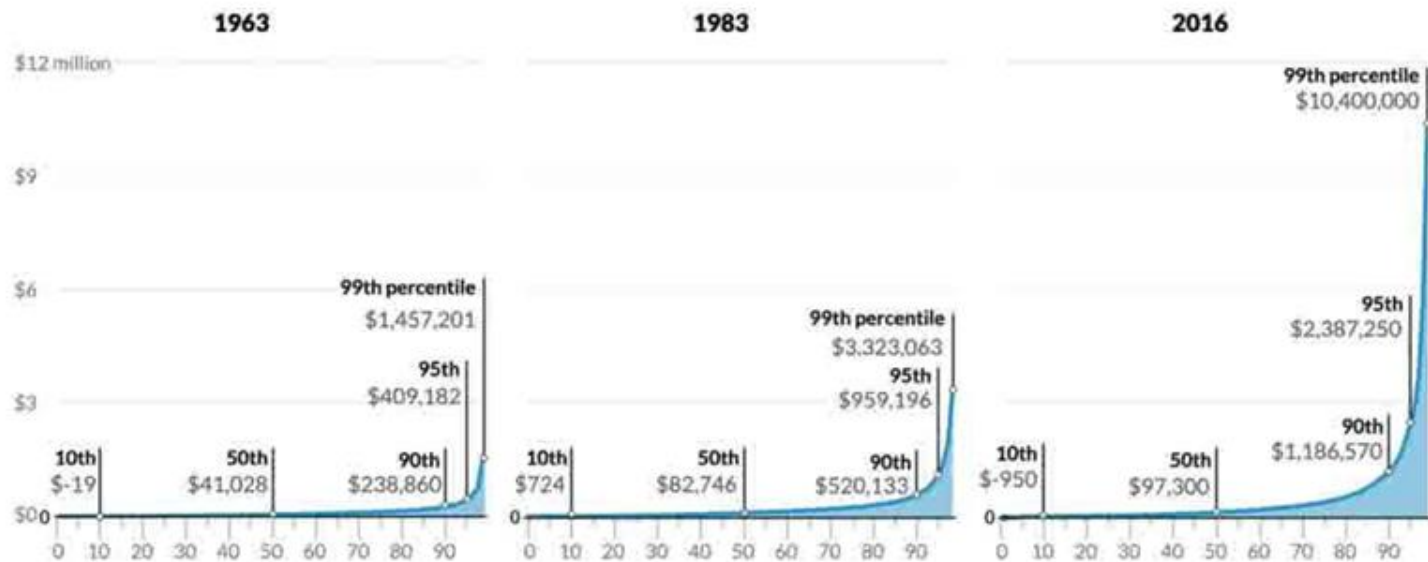
Note: 2016 dollars.

URBAN INSTITUTE

SOURCE: APPS.URBAN.ORG/FEATURES/WEALTH-INEQUALITY-CHARTS

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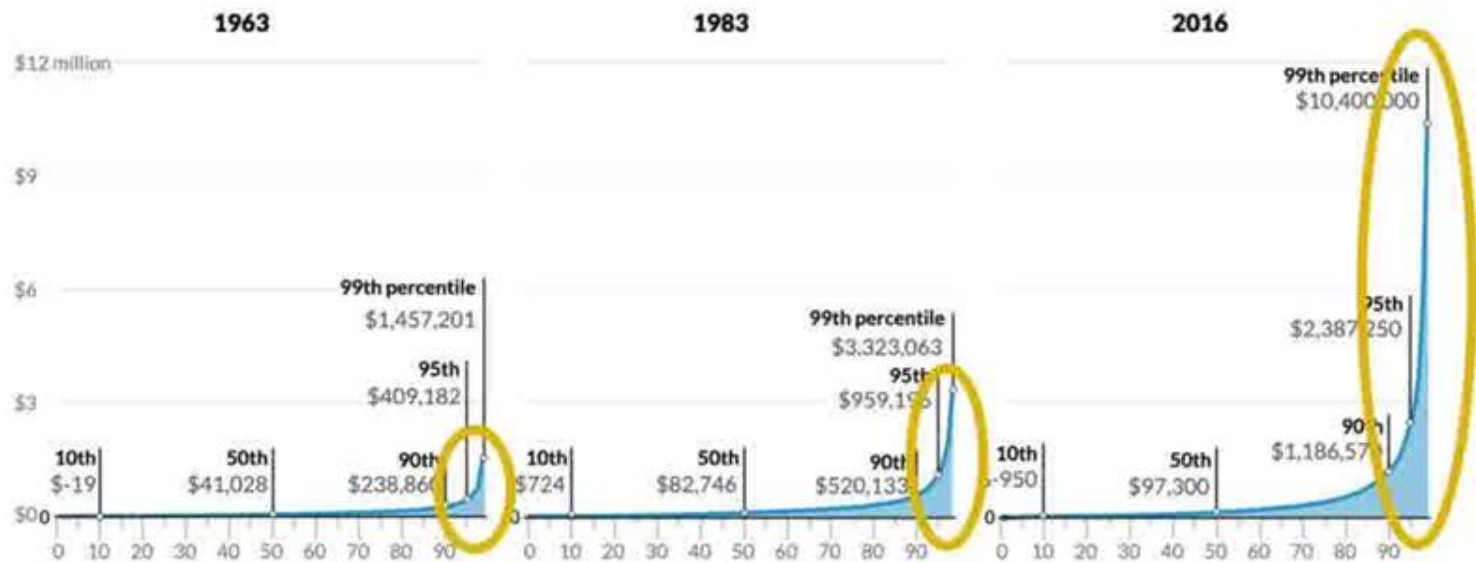
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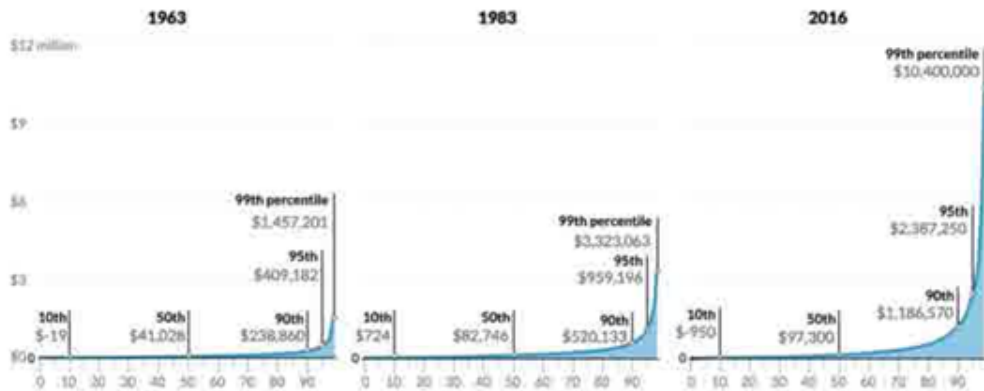
Note: 2016 dollars.

URBAN INSTITUTE

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Visual description of the data

Distribution of Family Wealth, 1963–2016



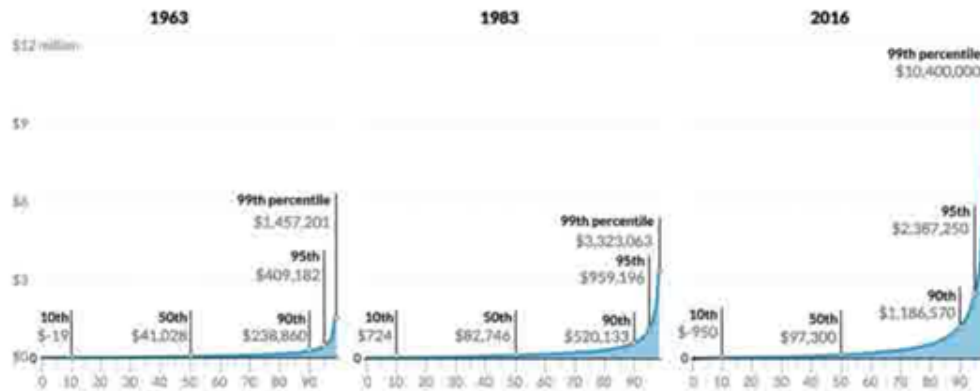
Source: Urban Institute calculations from Survey of Financial Characteristics of Consumers 1962 (December 31), Survey of Changes in Family Finances 1963, and Survey of Consumer Finances 1983–2016.

Note: 2016 dollars.

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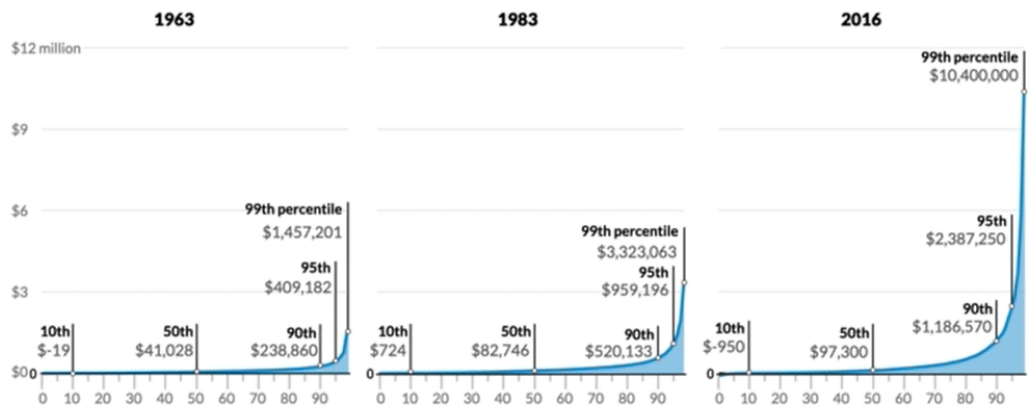
Message



Data

Visual description of the data

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Source: Urban Institute calculations from Survey of Financial Characteristics of Consumers 1962 (December 31), Survey of Changes in Family Finances 1963, and Survey of Consumer Finances 1983–2016.
 Note: 2016 dollars.

URBAN INSTITUTE



Message



Data

**Communication
succeeds**

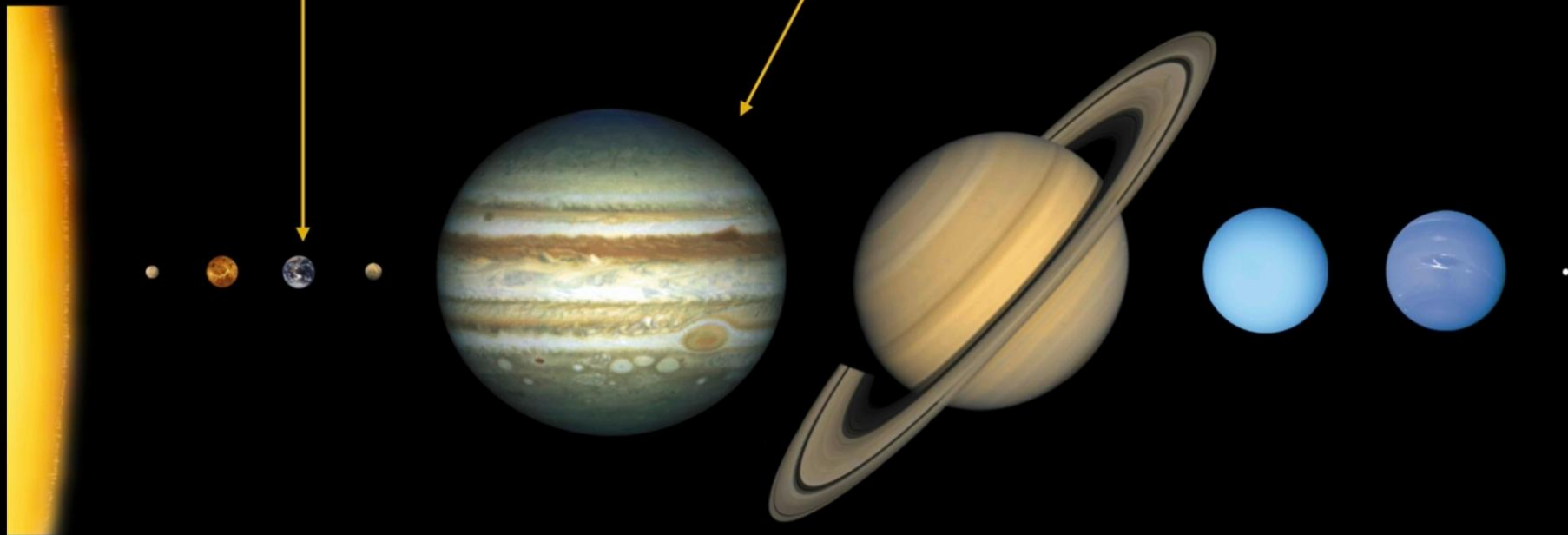
Planet	Radius (km)
Jupiter	69,911
Saturn	58,232
Uranus	25,362
Neptune	24,622
Earth	6,371
Venus	6,052
Mars	3,390
Mercury	2,440

Planet	Radius (km)
Jupiter	69,911
Saturn	58,232
Uranus	25,362
Neptune	24,622
Earth	6,371
Venus	6,052
Mars	3,390
Mercury	2,440

**“Jupiter’s radius is 10x
the radius of the Earth”**

Earth

Jupiter





*A picture is worth a
thousand words*

“

*A picture is worth a
thousand words*



"V-J DAY ON TIMES SQUARE": ALFRED EISENSTAEDT, 1945

“

*A (good) graph is worth a
thousand numbers*

What is data visualization?

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Communicate data in a natural, effective way

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Communicate data in a natural, effective way

Reveal information in a more impactful way

What is data visualization?

Communicate data in a natural, effective way

Reveal information in a more impactful way

Assist the viewer in **thinking** about the content

What is data visualization?

Communicate data in a natural, effective way

Reveal information in a more impactful way

Assist the viewer in **thinking** about the content

Tool to **lie** about data and **distort** information

What is data visualization?

Communicate data in a natural, effective way

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~~Tool to **lie** about data and **distort** information~~