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Week 1

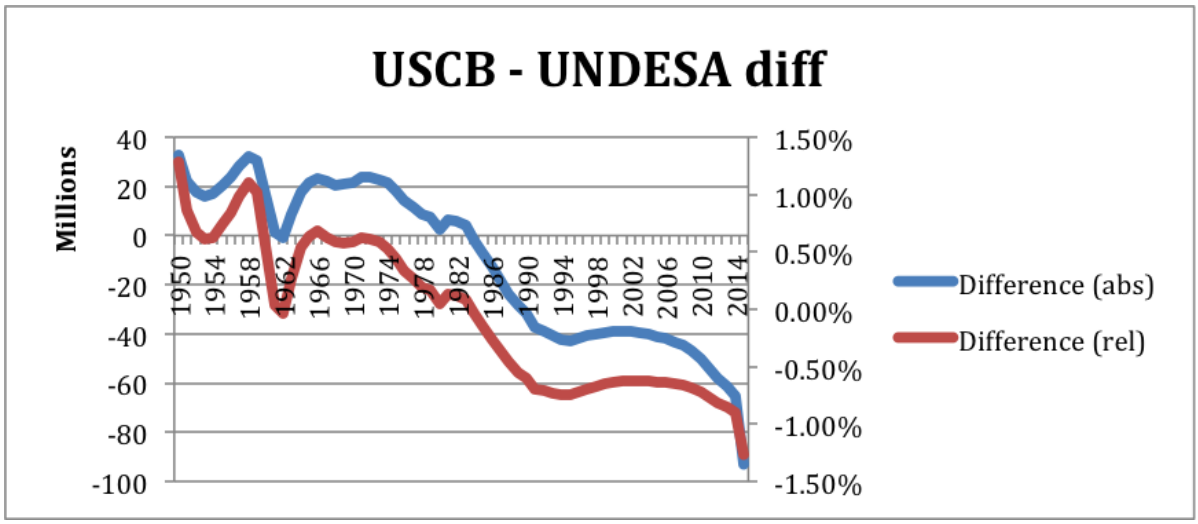
- What trends do you see in the data?
  - From 1950 to 2015 linear trend.
  - Same for 1950-2050
- Analyze how big the differences between various estimates are. Do you see a trend, i.e., do the differences become smaller or larger over time?
  - The differences in the estimates become larger over time. This is because the population is estimated and extrapolated.
- Think about these differences relative to the estimates at the respective time points and in absolute terms. When are the uncertainties the largest in absolute, when in relative terms?
  - The further in time, the more uncertain the estimates become in absolute numbers.
  - In relative terms, the difference becomes larger as well. (2% difference in 2030 between the first and second estimate compared to 4% in 2050)
- Do you think you can faithfully represent the uncertainty and the data in the same plot? Why, or why not?
  - Yes you can represent the data in the same plot. You can show the uncertainty with a dotted line.
- What effect do you think will the linear interpolation have on the uncertainty?
  - It won’t make the uncertainty bigger because the interpolation is the most logical choice for this dataset.
- Is linear interpolation a suitable method for this data?
  - Yes because there are no extreme outliers in the dataset.

Opdracht 2:

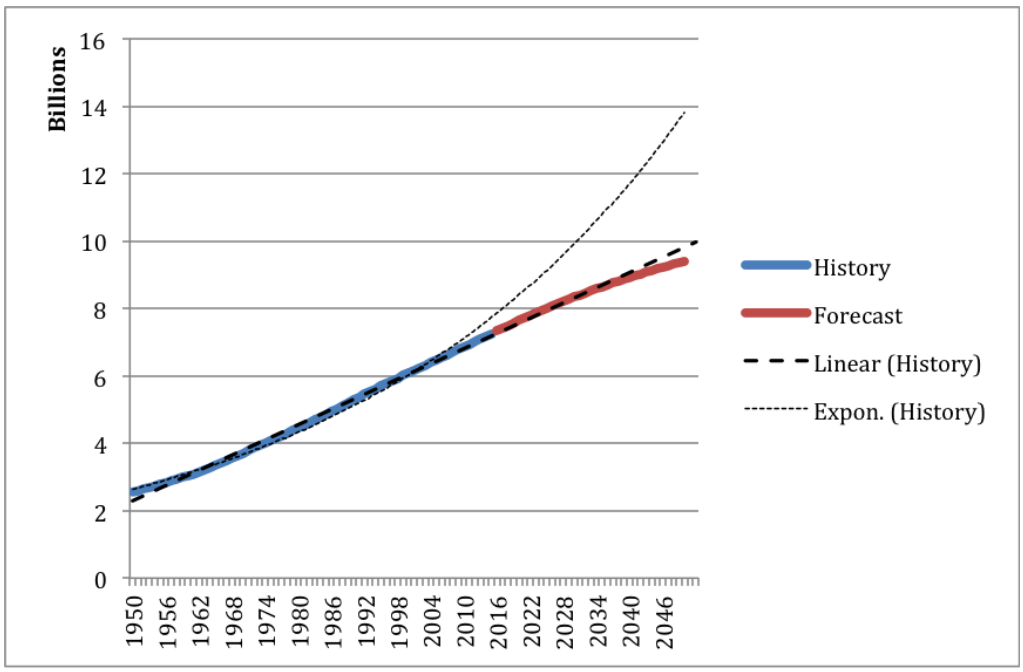
- To get a feeling for the final visualization, try to draw the data to scale.
- Instead of or in addition to showing 5 conflicting lines, develop a visualization that shows the data and the ambiguity. You can use a single visualization, or you can use multiple views.
- Your visualization should show the divergence between estimates in absolute terms (i.e., the difference in number of people) as well as in relative terms (i.e., % of divergence/uncertainty relative to a consensus value for a given year).
- Your visualization should make it easy to read a specific “consensus number” for every year.

Belle

1. Dit is het relatieve en absolute verschil tussen de twee bureaus United States Census Bureau en United Nations Department of Economic and Social Affairs (deze 2 hadden de meeste gegevens hadden) tussen 1950 en 2016.

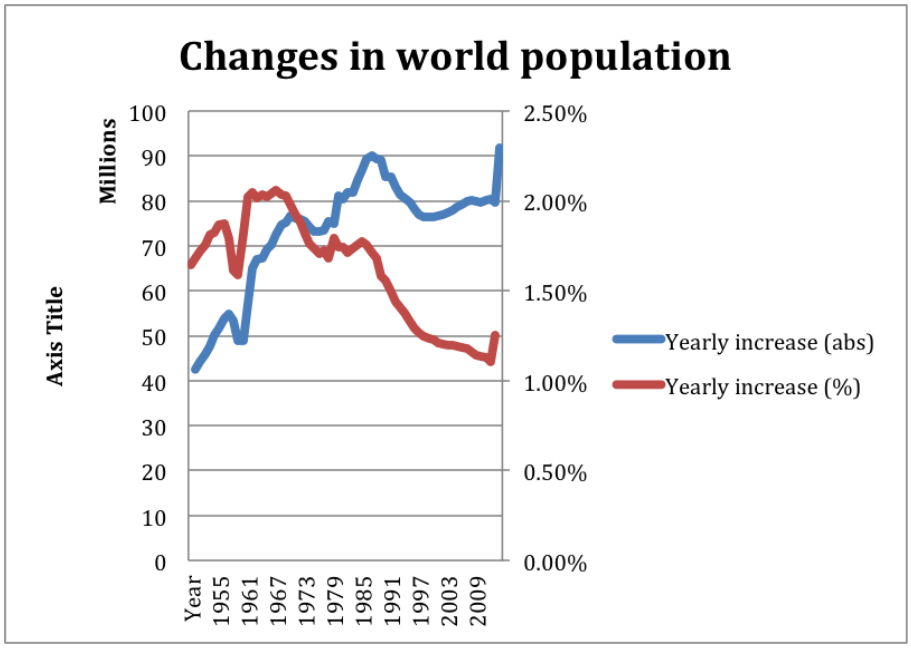


2. Deze grafiek laat de gegevens van United States Census Bureau vanaf 1950 tot 2050 zien. Vanaf 2016 tot 2050 hebben zij een voorspelling gemaakt. De stippellijnen geven een lineaire en exponentiële voorspelling weer aan de hand van de gegevens die het al heeft (dit kon blijkbaar via excel). Er is te zien dat de voorspellingen vooral lineair zijn met de gegevens die ze hebben maar op het einde een klein beetje afloopt.

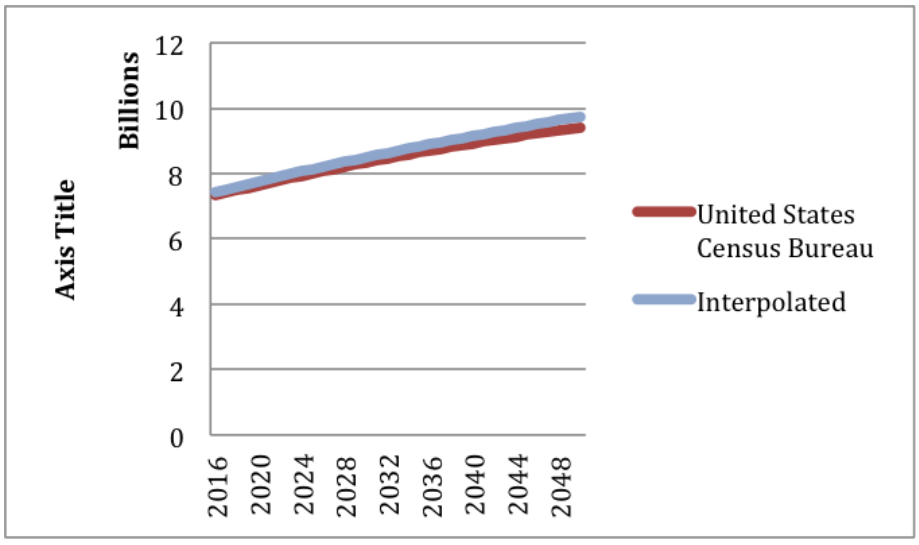


3. Eerst heb ik een gemiddelde gemaakt van de twee bureaus die de meeste gegevens hadden tussen 1950 en 2016. Dit waren United Nations Department of Economic and Social

Affairs en United States Census Bureau. De jaarlijkse stijging van het gemiddelde van die twee bureaus is relatief en absoluut weergegeven. Er is dus te zien dat er een zekere absolute stijging is van de populatie maar relatief is het een daling. Het zou natuurlijk logisch zijn als de populatie elk jaar relatief zou stijgen maar dit is dus niet het geval.

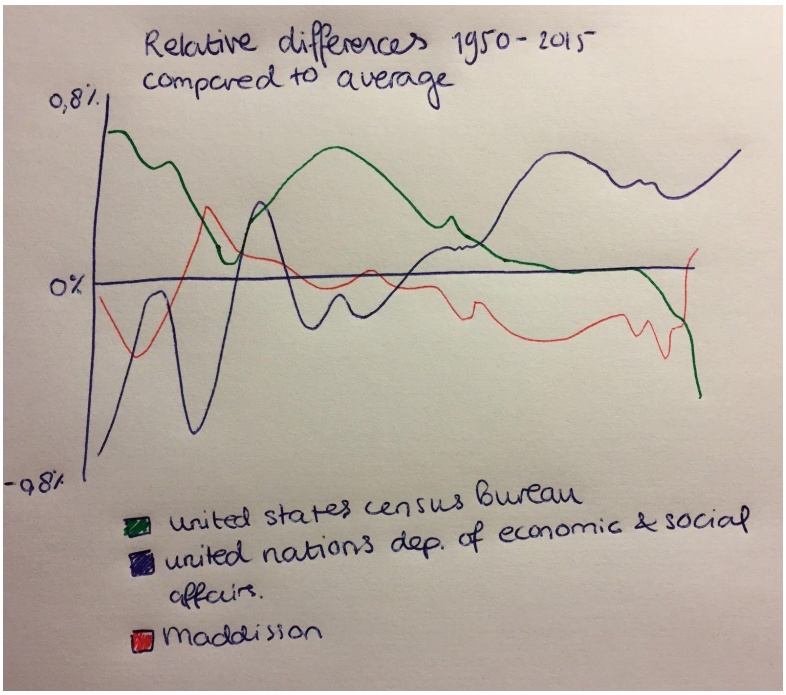


4. De twee bureaus die ik heb gebruikt om de voorspellingen weer te geven zijn United States Census Bureau en United Nations Department of Economic and Social Affairs. Die laatste had ongeveer om de 5 jaar een voorspelling gemaakt dus door extrapolatie heb ik de openstaande jaren ingevuld. De verschillen lijken niet groot tussen de twee maar dit gaat toch om enorme aantallen.

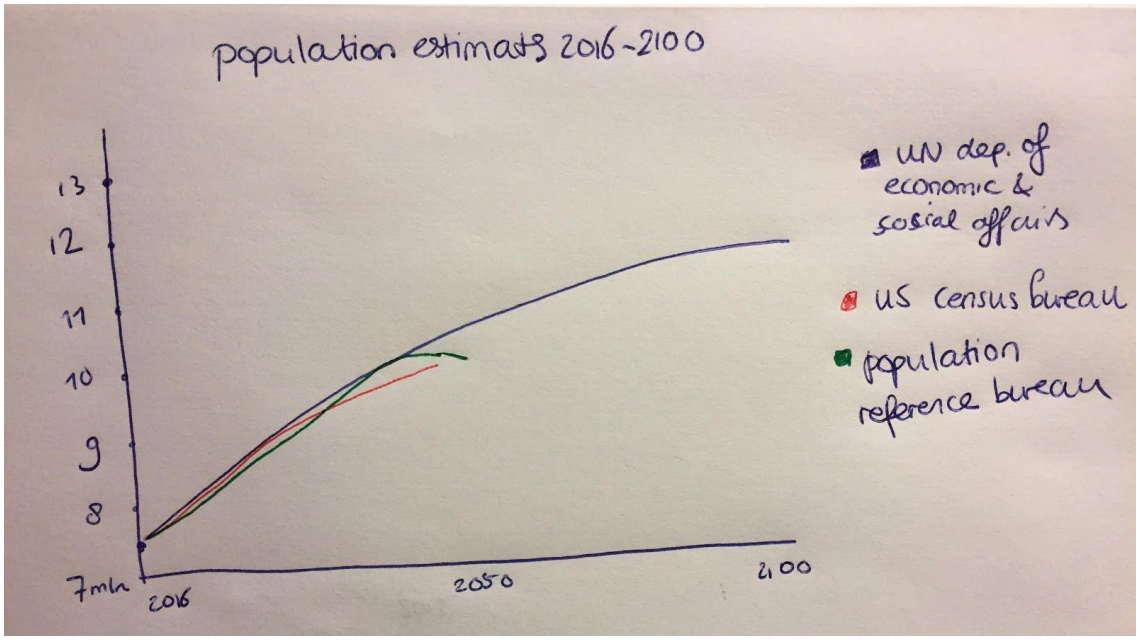


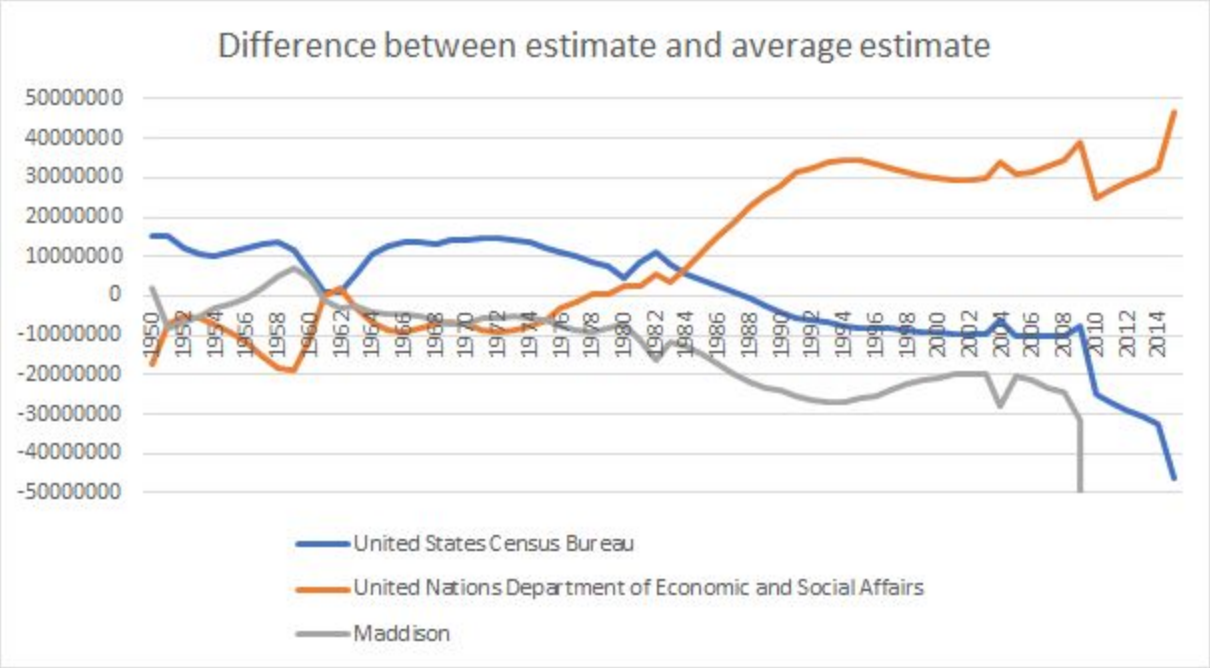
Visualizations:

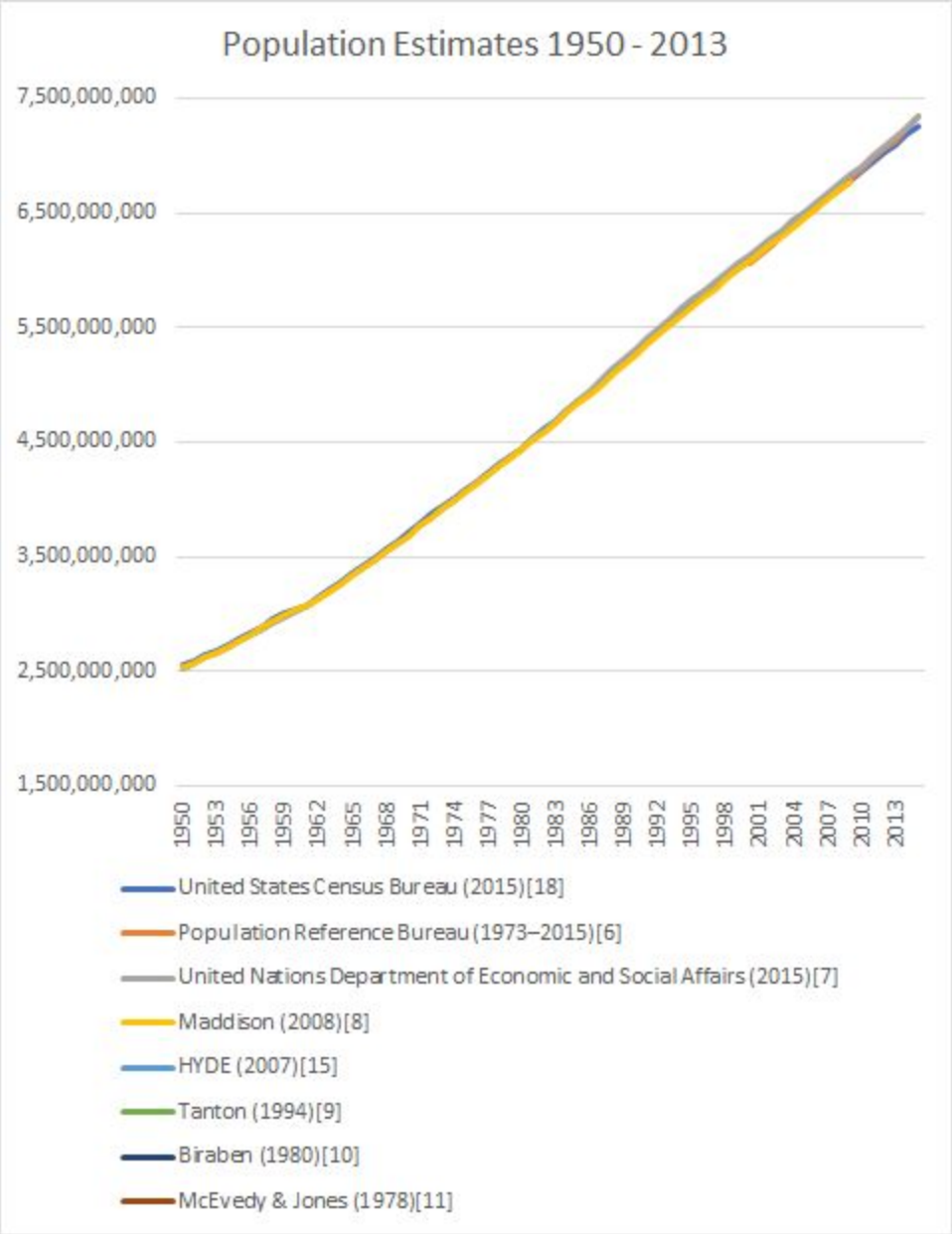
Relative differences compared to average 1950-2015

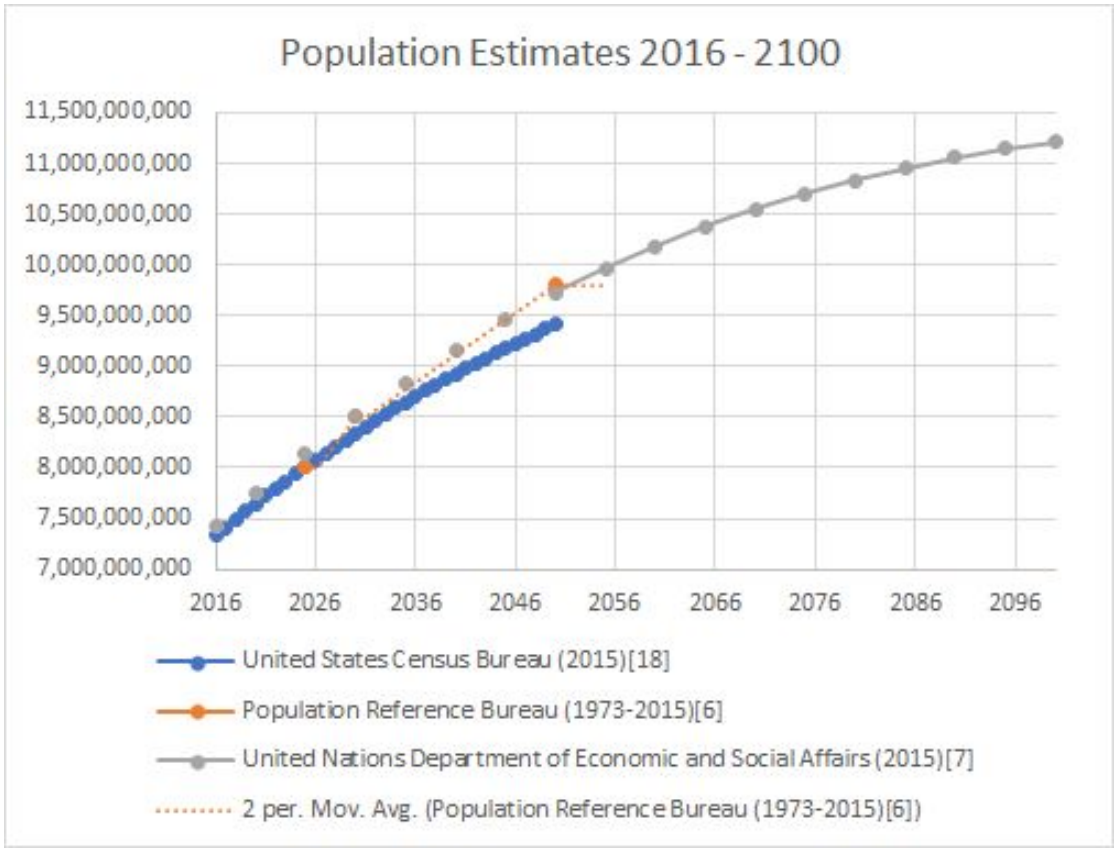


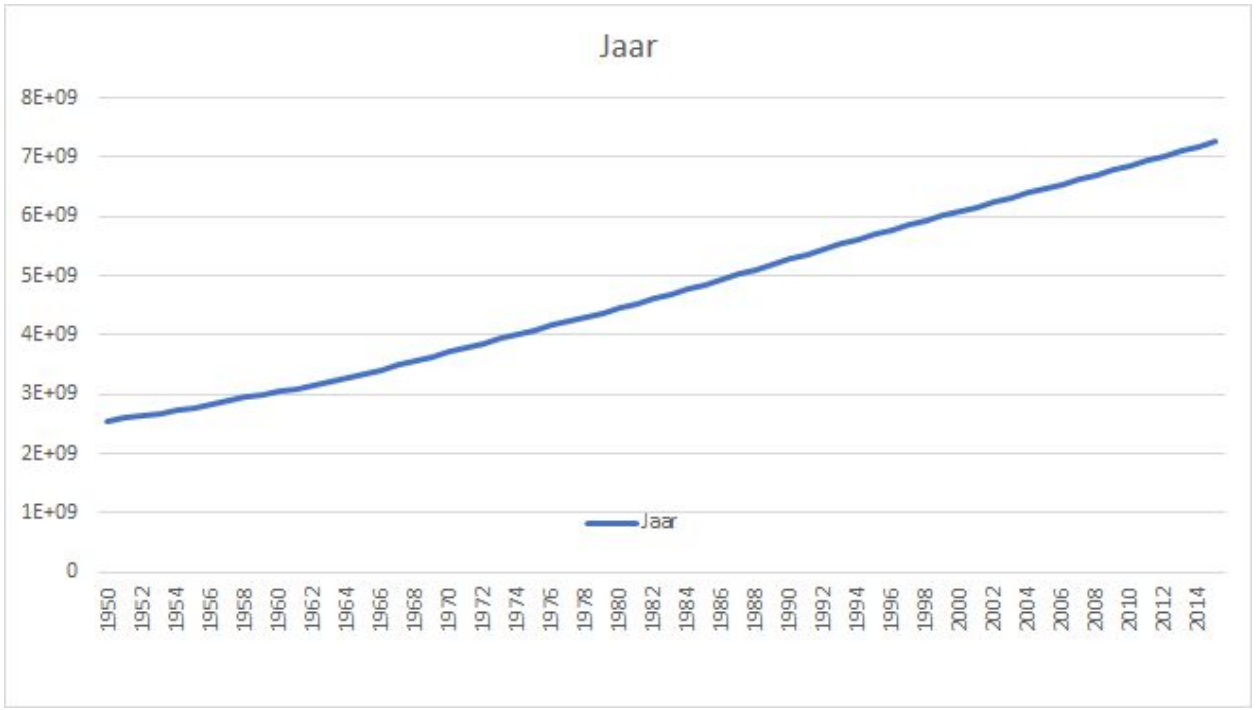
Population estimates 2016-2100




Difference between estimate and average estimate
50000000
40000000
30000000
20000000
10000000
0
-10000000
-20000000
-30000000
-40000000
-50000000
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
United States Census Bureau
United Nations Department of Economic and Social Affairs
Maddison


Population Estimates 1950 - 2013
7,500,000,000
6,500,000,000
5,500,000,000
4,500,000,000
3,500,000,000
2,500,000,000
1,500,000,000
1950
1953
1956
1959
1962
1965
1968
1971
1974
1977
1980
1983
1986
1989
1992
1995
1998
2001
2004
2007
2010
2013
United States Census Bureau (2015)[18]
Population Reference Bureau (1973–2015)[6]
United Nations Department of Economic and Social Affairs (2015)[7]
Maddison (2008)[8]
HYDE (2007)[15]
Tanton (1994)[9]
Biraben (1980)[10]
McEvedy & Jones (1978)[11]


Population Estimates 2016 - 2100
11,500,000,000
11,000,000,000
10,500,000,000
10,000,000,000
9,500,000,000
9,000,000,000
8,500,000,000
8,000,000,000
7,500,000,000
7,000,000,000
2016
2026
2036
2046
2056
2066
2076
2086
2096
United States Census Bureau (2015)[18]
Population Reference Bureau (1973-2015)[6]
United Nations Department of Economic and Social Affairs (2015)[7]
2 per. Mov. Avg. (Population Reference Bureau (1973-2015)[6])


Jaar
8E+09
7E+09
6E+09
5E+09
4E+09
3E+09
2E+09
1E+09
0
Jaar
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
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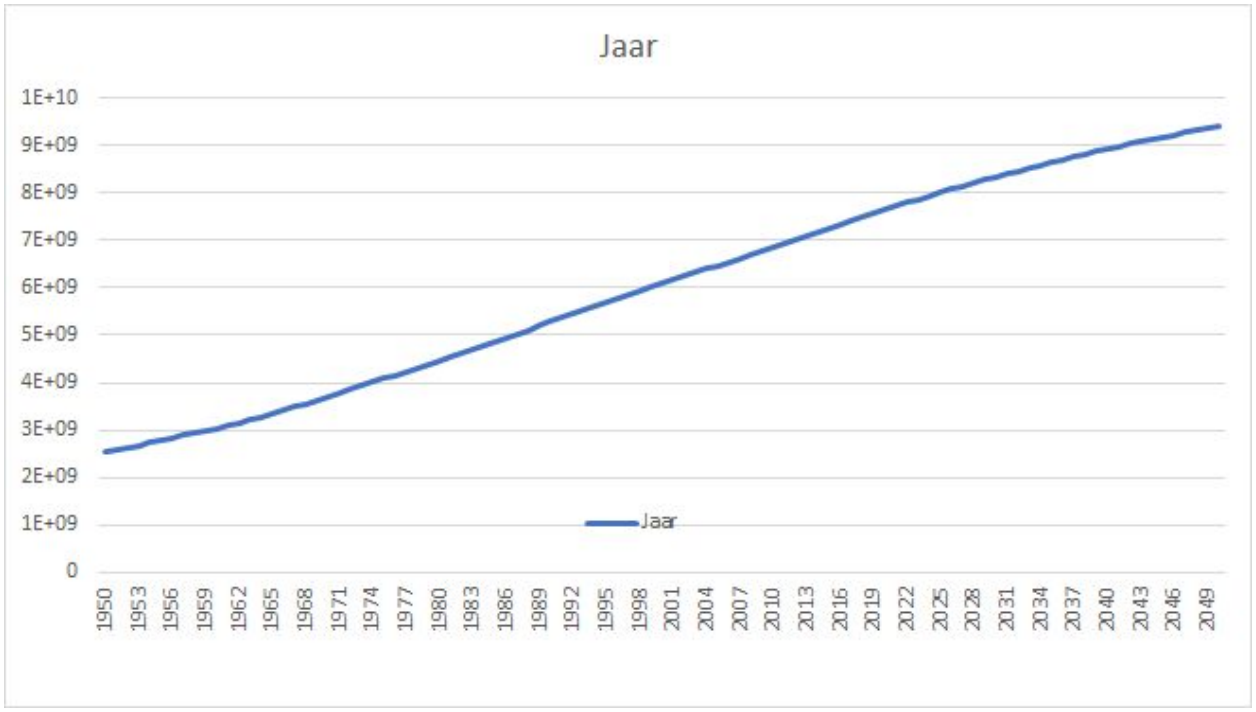
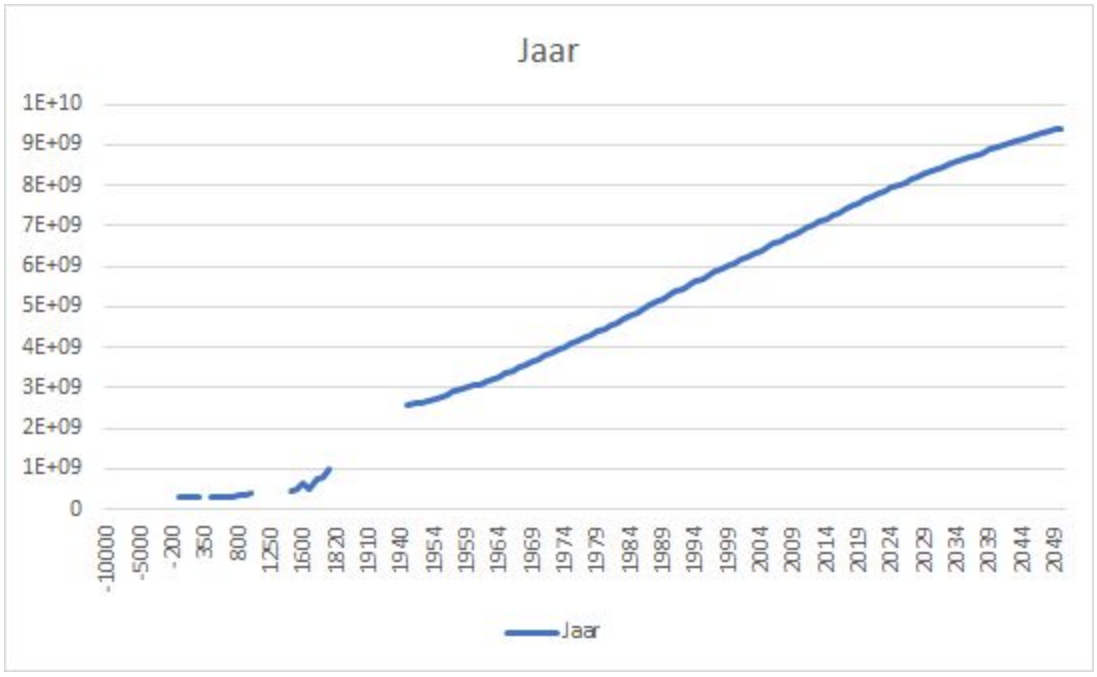
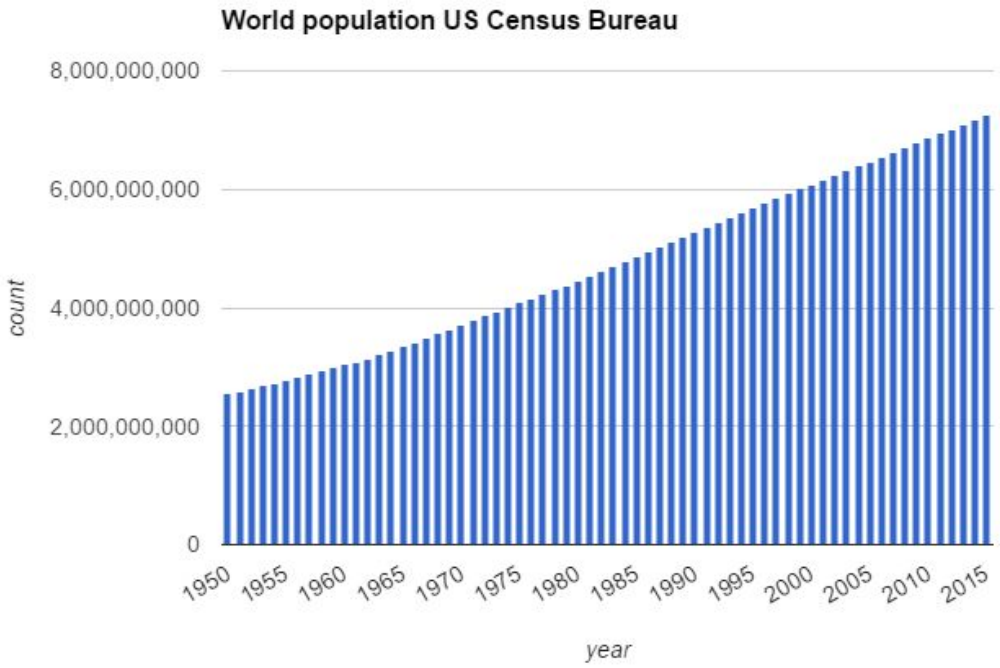
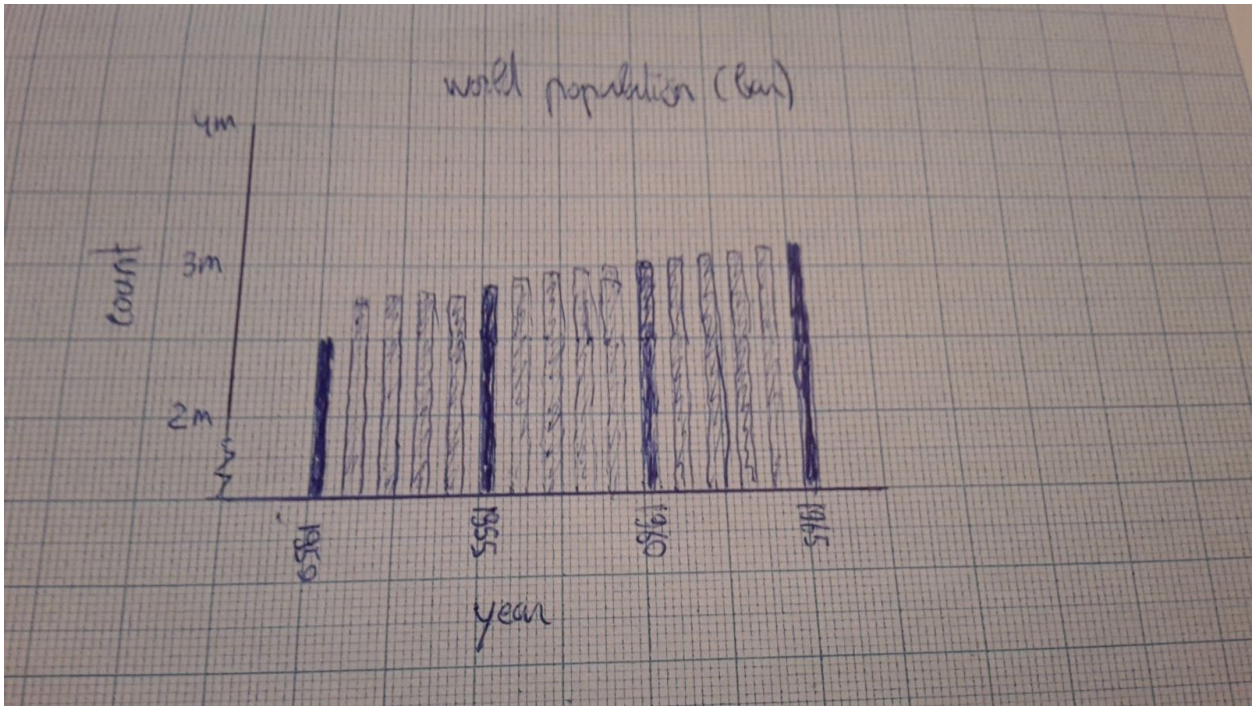
2006
2008
2010
2012
2014


Jaar
1E+10
9E+09
8E+09
7E+09
6E+09
5E+09
4E+09
3E+09
2E+09
1E+09
0
Jaar
1950
1953
1956
1959
1962
1965
1968
1971
1974
1977
1980
1983
1986
1989
1992
1995
1998
2001
2004
2007
2010
2013
2016
2019
2022
2025
2028
2031
2034
2037
2040
2043
2046
2049


Jaar
1E+10
9E+09
8E+09
7E+09
6E+09
5E+09
4E+09
3E+09
2E+09
1E+09
0
Jaar
-10000
-5000
-200
350
800
1250
1600
1820
1910
1940
1954
1959
1964
1969
1974
1979
1984
1989
1994
1999
2004
2009
2014
2019
2024
2029
2034
2039
2044
2049

It would probably be easier to read when split across multiple graphs covering these 65 years in ~¾ graphs. Another solution would be to color every 5th year differently, or at least easily recognizable. These solutions are shown in the hand drawn bar graph below this graph.





Design four alternative visual representations for representing the data and the uncertainty in the data. Consider different scales, both for time and for population numbers. You should design for an interactive system, i.e., you should not assume that you have to fit all content onto paper. Please take the theory from the video lecture on Graphic design into account. Here are some points you should consider:

- To get a feeling for the final visualization, try to draw the data to scale.
- Instead of or in addition to showing 5 conflicting lines, develop a visualization that shows the data and the ambiguity. You can use a single visualization, or you can use multiple views.
- Your visualization should show the divergence between estimates in absolute terms (i.e., the difference in number of people) as well as in relative terms (i.e., % of divergence/uncertainty relative to a consensus value for a given year).
- Your visualization should make it easy to read a specific “consensus number” for every year.

Wat is interessant:

1. Bekijk **United States Census Bureau** vanaf 1950 tot 2050 (absoluut)
2. Bekijk **United States Census Bureau** relatief vanaf 2016 (1950 ™ 2050)
3. Vergelijk de verschillende bureaus met elkaar vanaf 19950 tot 2050