

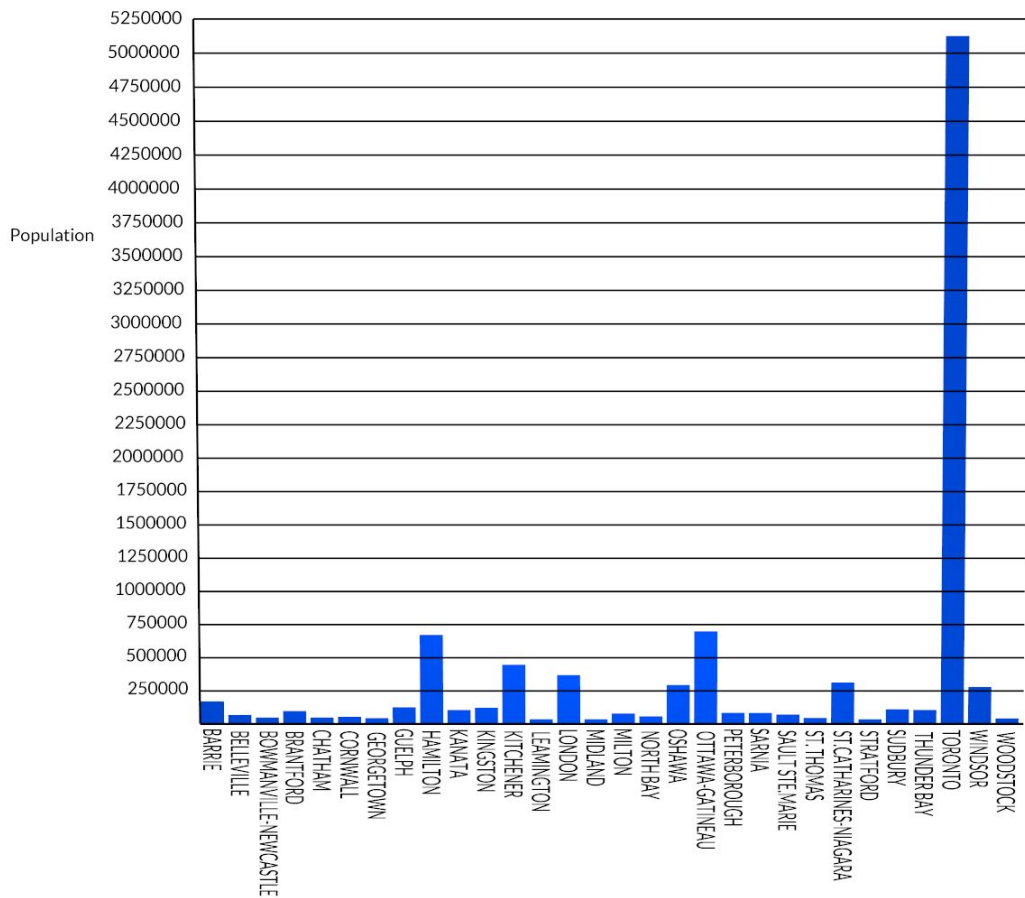
Perspective Charts

User Study Tasks

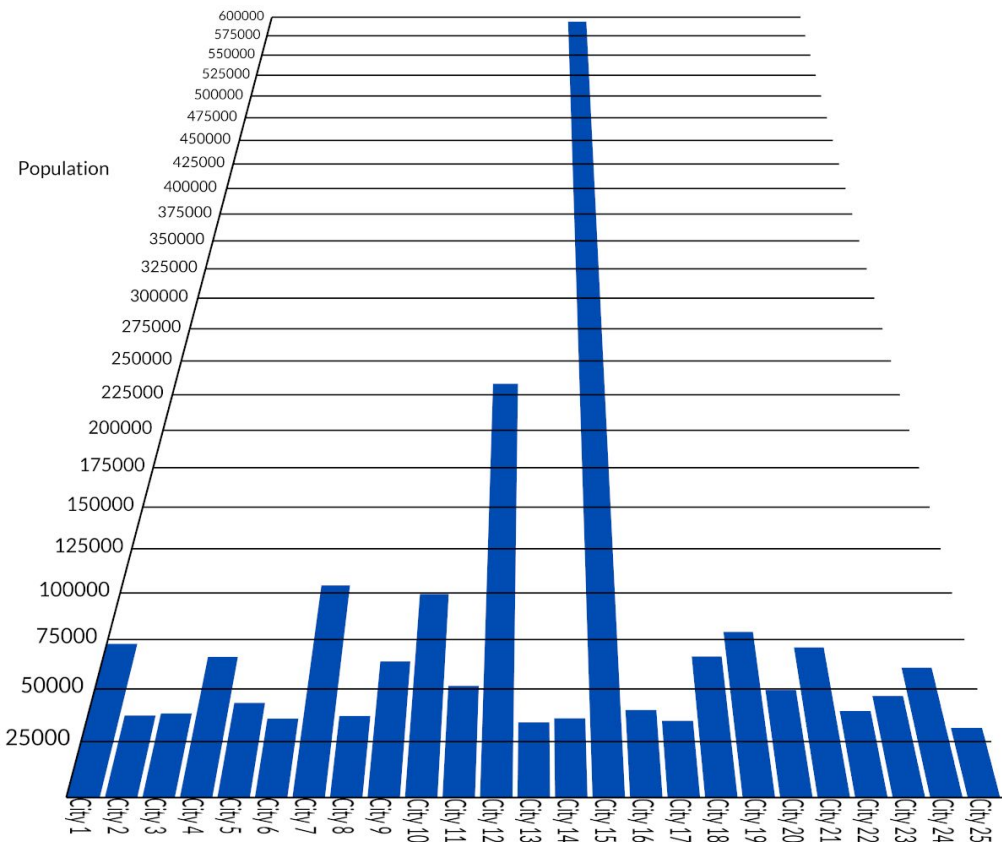
Task Overview

- The following pages list the tasks and visualizations used in the Perspective Charts user study. Participants were shown each visualization on a computer screen and were given a booklet with the list of tasks. Participants also recorded their responses in this booklet. During the study, participants were only shown the charts for the group they were in (A or B), without the questions, taxonomies, or answers listed next to them.

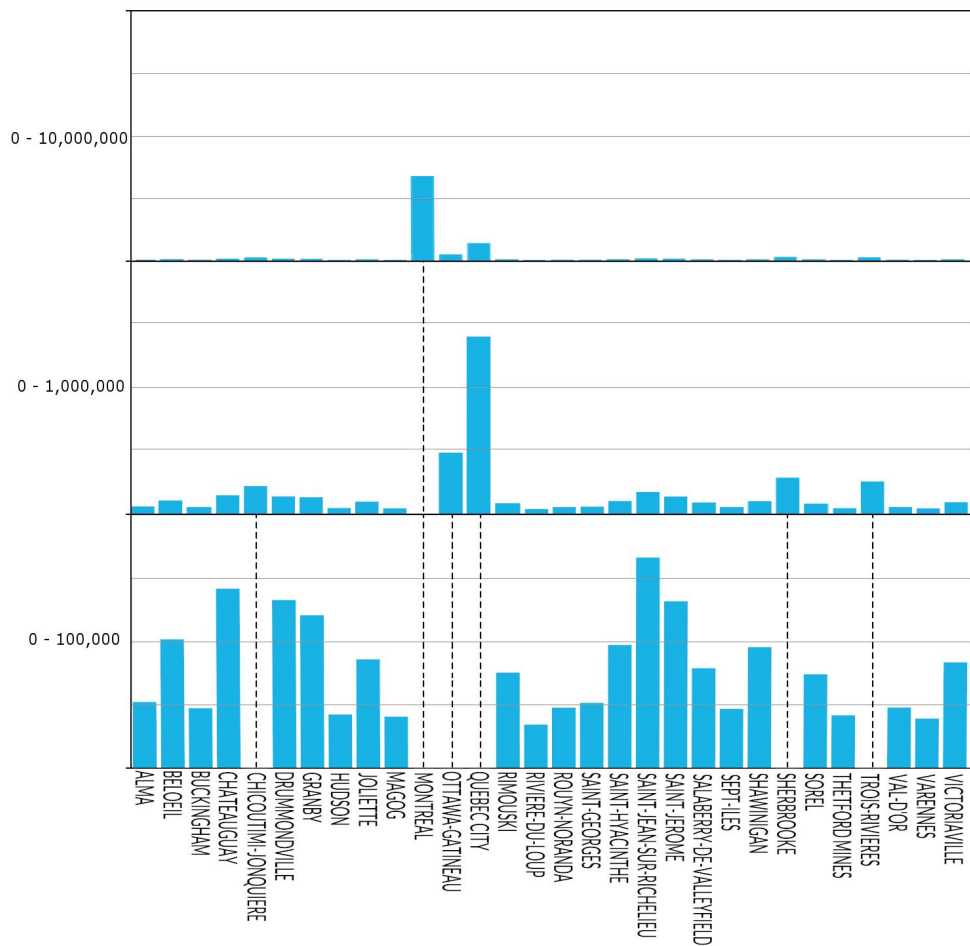
Group A



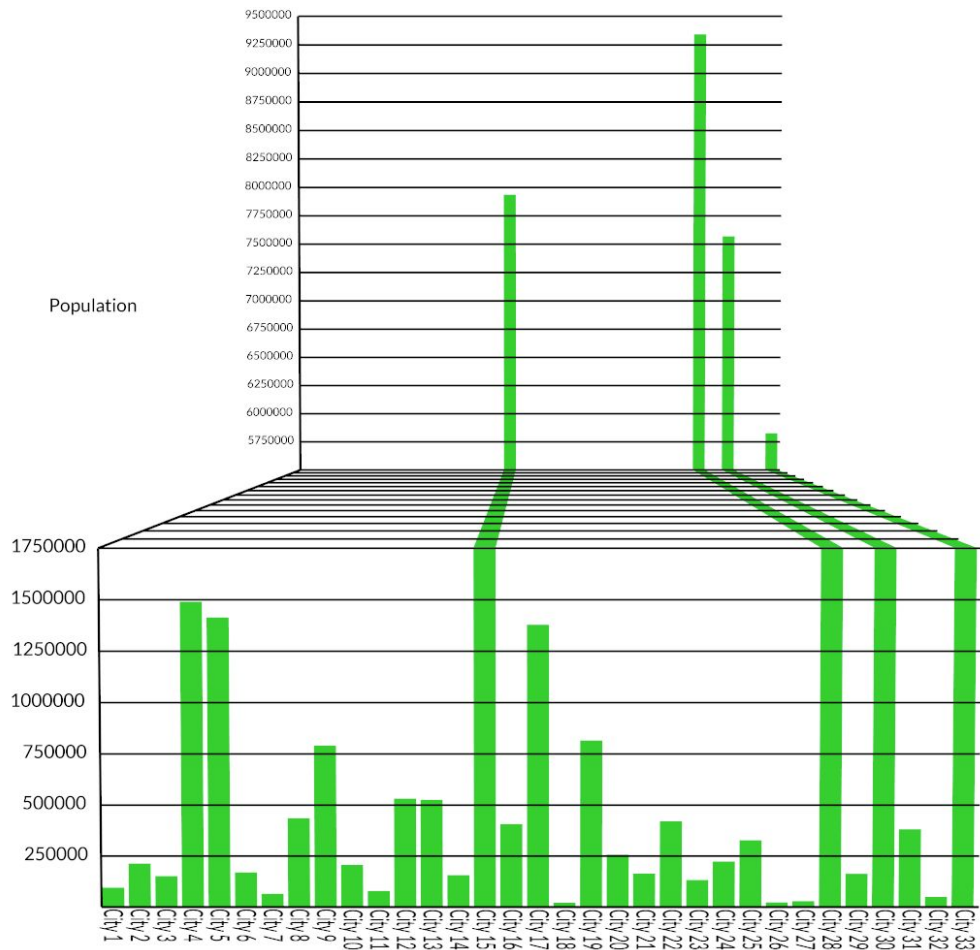
1. **Retrieve Value (Small):** What is the population of Chatham? (A: 44074)
2. **Determine Magnitude Difference (Two small values):** What is the difference between the populations of Guelph and North Bay? (A: 68847)
3. **Determine Magnitude Difference (Small and large value):** How much larger is Toronto than Hamilton? (For example, 2x larger, 2.5x larger) (A: 7.65 x)
4. **Find Extremium:** Which city has the smallest population? (A: Stratford)
5. **Find Extremium:** What is the size of the largest gap between populations? (A: 5101908)
6. **Filter:** How many cities have a population of more than 300,000? (A: 6)



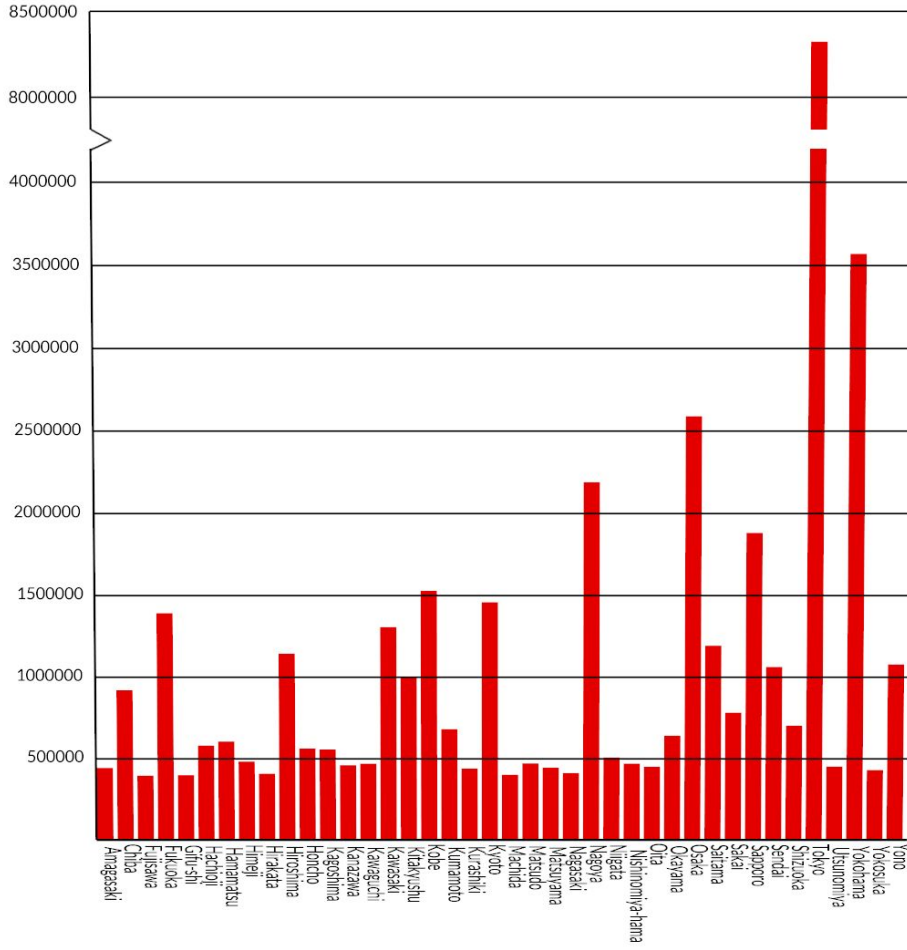
1. **Retrieve Value (Small):** What is the population of City 17? (A: 34451)
2. **Determine Magnitude Difference (Two small values):** What is the difference between the populations of City 22 and City 24? (A: 21305)
3. **Determine Magnitude Difference (Small and large value):** How much larger is City 15 than City 9? (For example, 2x larger, 2.5x larger) (A: 9.36 x)
4. **Find Extremium:** Which city has the smallest population? (A: City 25)
5. **Find Extremium:** What is the size of the largest gap between populations? (A: 563755)
6. **Filter:** How many cities have a population of more than 60,000? (A: 11)



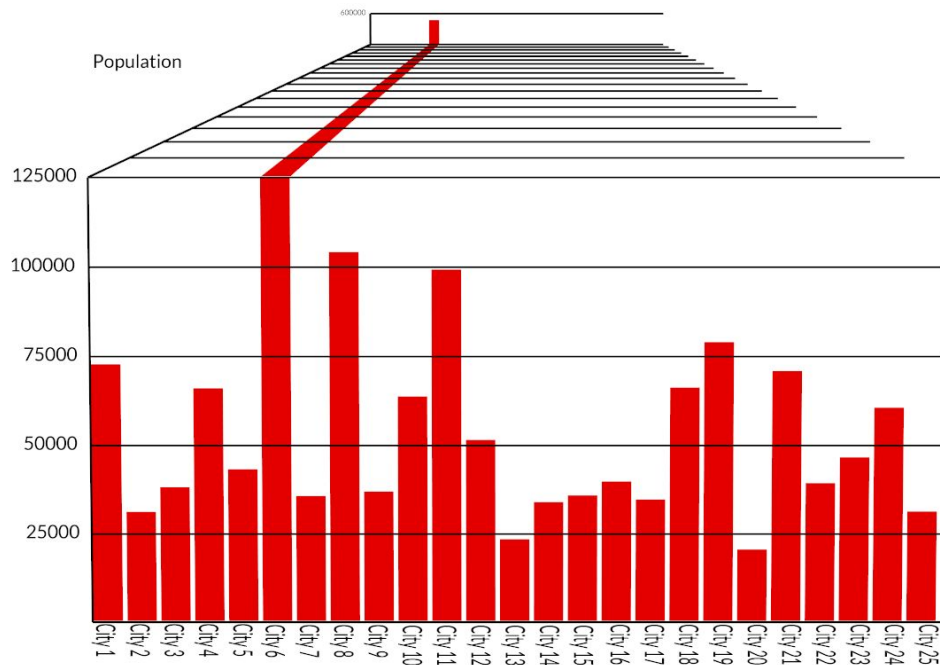
1. **Retrieve Value (Small):** What is the population of Rimouski? (A: 37664)
2. **Determine Magnitude Difference (Two small values):** What is the difference between the populations of Joliette and Sherbrooke? (A: 97745)
3. **Determine Magnitude Difference (Small and large value):** How much larger is Montreal than Drummondville? (For example, 2x larger, 2.5x larger) (A: 51.4 x)
4. **Find Extremium:** What is the size of the largest gap between populations? (A: 3390877)



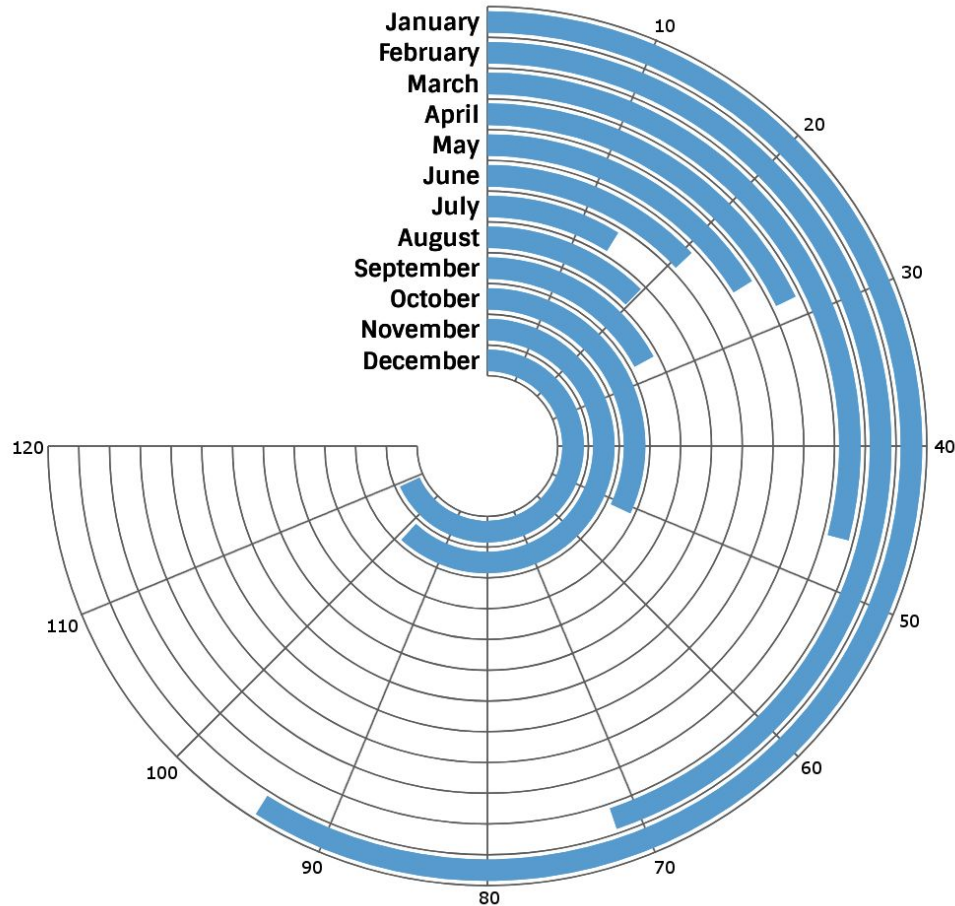
1. **Retrieve Value (Small):** What is the population of City 14? (A: 152200)
2. **Determine Magnitude Difference (Two small values):** What is the difference between the populations of City 6 and City 7? (A: 105300)
3. **Determine Magnitude Difference (Small and large value):** How much larger is City 30 than City 25? (For example, 2x larger, 2.5x larger) (A: 23.4 x)
4. **Find Extremium:** What is the size of the largest gap between populations? (A: 9329800)



1. **Retrieve Value (Small):** What is the population of Machida? (A: 399969)
2. **Retrieve Value (Large):** What is the population of Tokyo? (A: 8336599)
3. **Determine Magnitude Difference (Two small values):** What is the difference between the populations of Sapporo and Osaka? (A: 709386)
4. **Determine Magnitude Difference (Small and large value):** How much larger is Tokyo than Chiba? (For example, 2x larger, 2.5x larger) (A: 9.06 x)

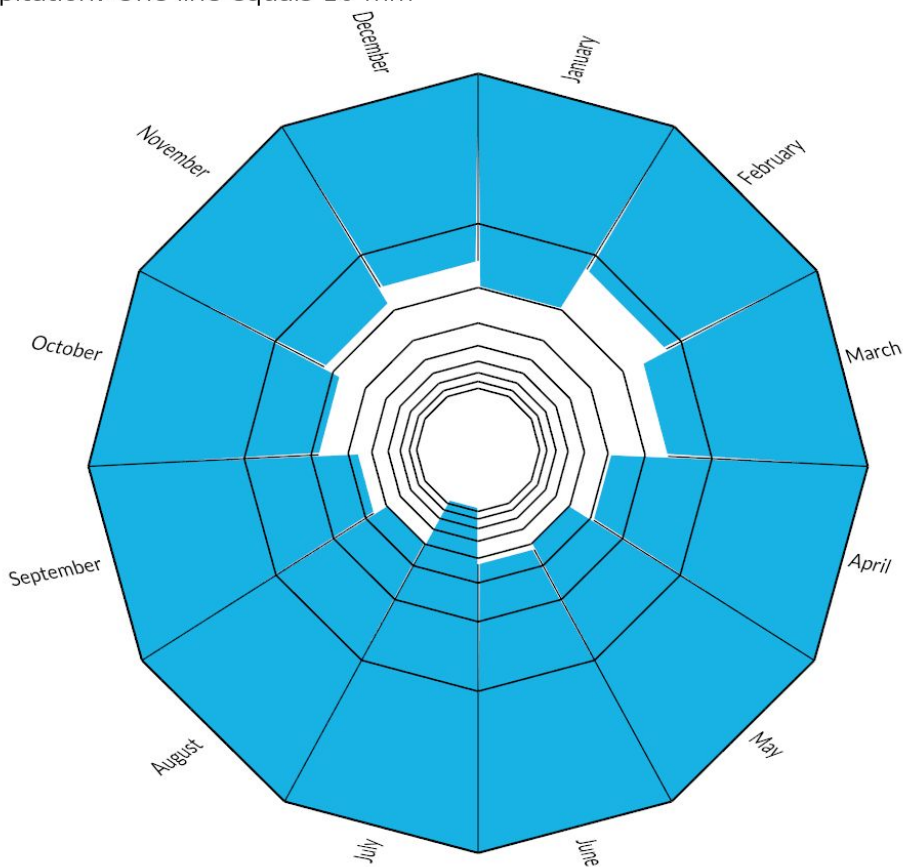


1. **Retrieve Value (Small):** What is the population of City 14? (A: 33736)
2. **Retrieve Value (Large):** What is the population of City 6? (A: 594833)
3. **Determine Magnitude Difference (Two small values):** What is the difference between the populations of City 13 and City 14? (A: 10527)
4. **Determine Magnitude Difference (Small and large value):** How much larger is City 6 than City 9? (For example, 2x larger, 2.5x larger) (A: 16.20 x)

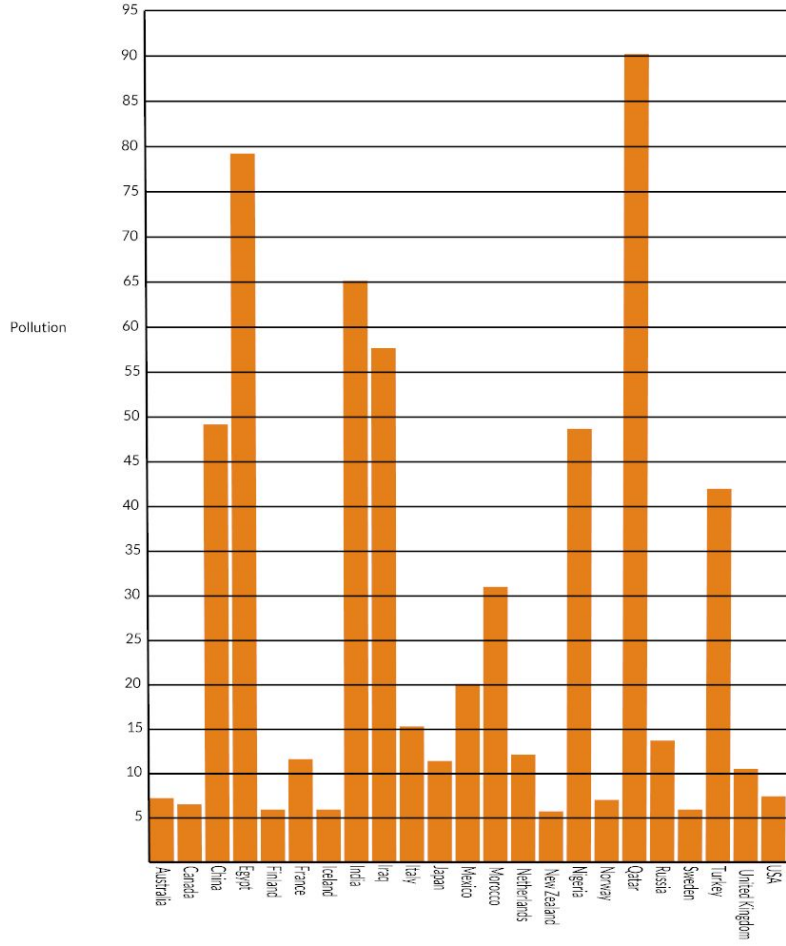


1. **Retrieve Value (Small):** What is the precipitation level in July? (A: 14.0)
2. **Determine Magnitude Difference (Small and large value):** What is the difference between the average amount of precipitation in May and November? (A: 73.1)
3. **Determine Magnitude Difference (Two small values):** How much precipitation was there in July compared to August? (For example. 1.5 times as much, 0.5 times as much) (A: 0.71 x)
4. **Sort:** Sort the average precipitation levels from lowest to highest. (A: July, August, June, May, September, April, March, October, February, January, November, December)

Precipitation: One line equals 10 mm



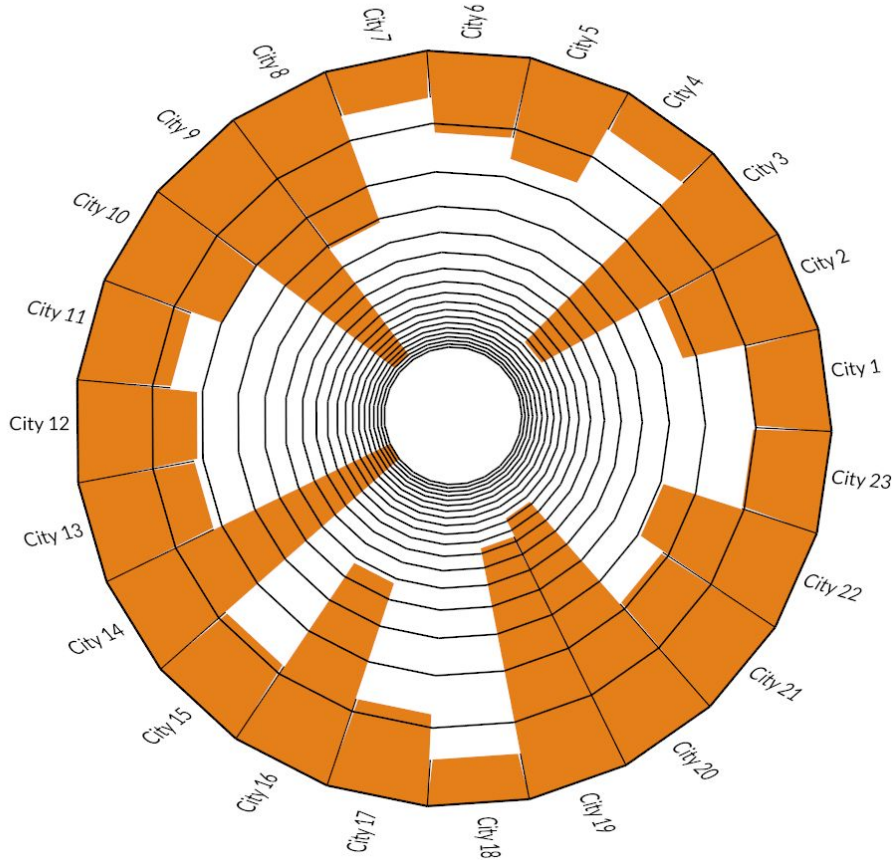
1. **Retrieve Value (Small):** What is the precipitation level in November? (A: 18)
2. **Determine Magnitude Difference (Two small values):** What is the difference between the average amount of precipitation in February and December? (A: 3.0)
3. **Determine Magnitude Difference (Two small values):** How much more precipitation was there in April than in February? (For example, "1.5 times as much" or "2 times as much") (A: 2.4 x)
4. **Sort:** Sort the average precipitation levels from lowest to highest. (A: February, December, March, November, January, October, April, September, June, May, August, July)



1. **Retrieve Value (Small):** What is the pollution level of Australia? (A: 7.2)
2. **Determine Magnitude Difference (Two small values):** What is the difference between the pollution levels of New Zealand and Norway? (A: 1.3)
3. **Determine Magnitude Difference (Small and large value):** How much more pollution is in Egypt than in Iceland? (For example, 2 times more, 2.5 times more) (A: 13.4 x)
4. **Filter:** Which countries have pollution levels of less than 12.5 (microns of fine particulate matter per square meter)? (A: *Australia, Canada, Finland, France, Iceland, Japan, Netherlands, New Zealand, Norway, Sweden, United Kingdom, USA*)

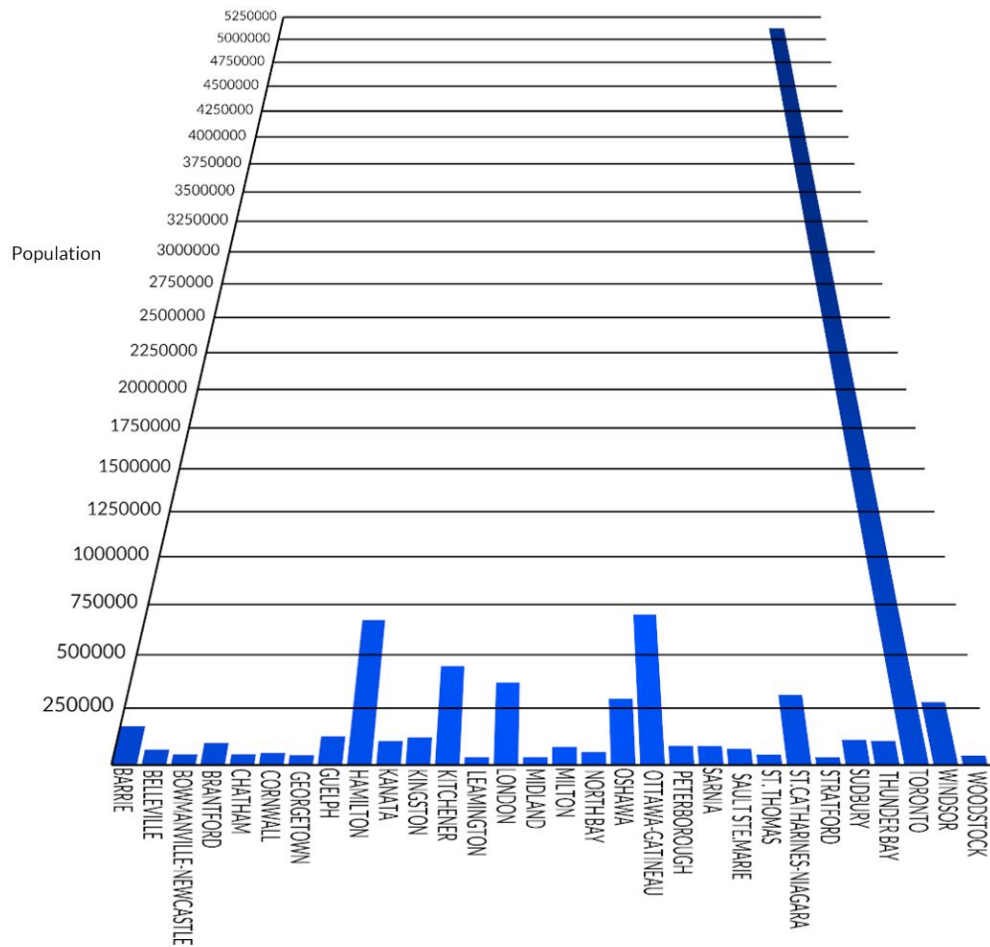
10

Pollution: One line equals 10

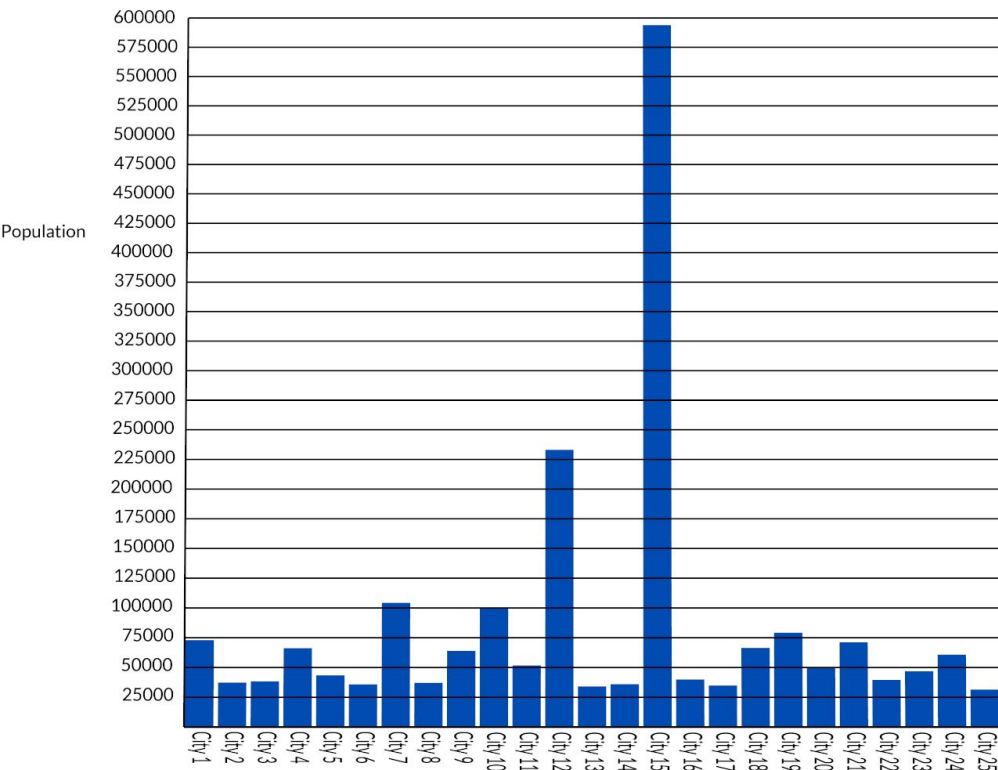


1. **Retrieve Value (Small):** What is the pollution level of City 5? (A: 15.7)
2. **Determine Magnitude Difference (Two small values):** What is the difference between the pollution levels of City 8 and City 13? (A: 13.2)
3. **Determine Magnitude Difference (Small and large value):** How much more pollution is in City 9 than in City 12? (For example, 2 times more, 2.5 times more) (A: 8.42)
4. **Filter:** Which cities have pollution levels of less than 18.5 microns of fine particulate matter per square meter? (A: 1, 4, 5, 6, 7, 11, 13, 15, 17, 18, 23)

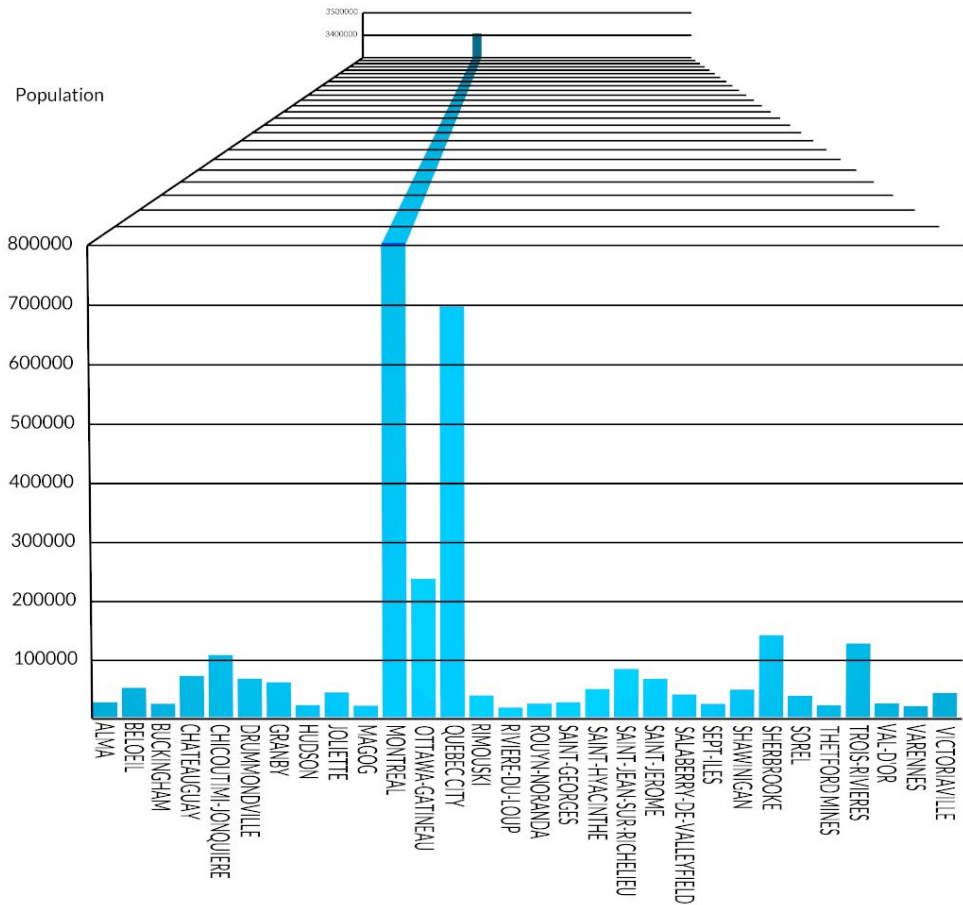
Group B



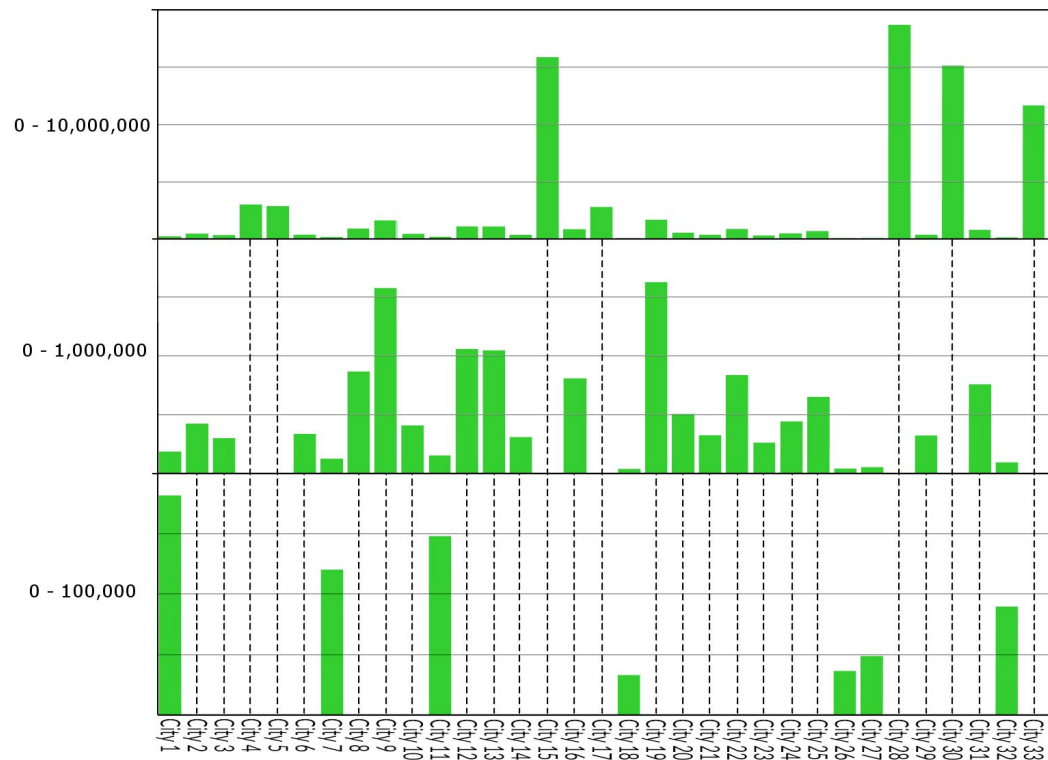
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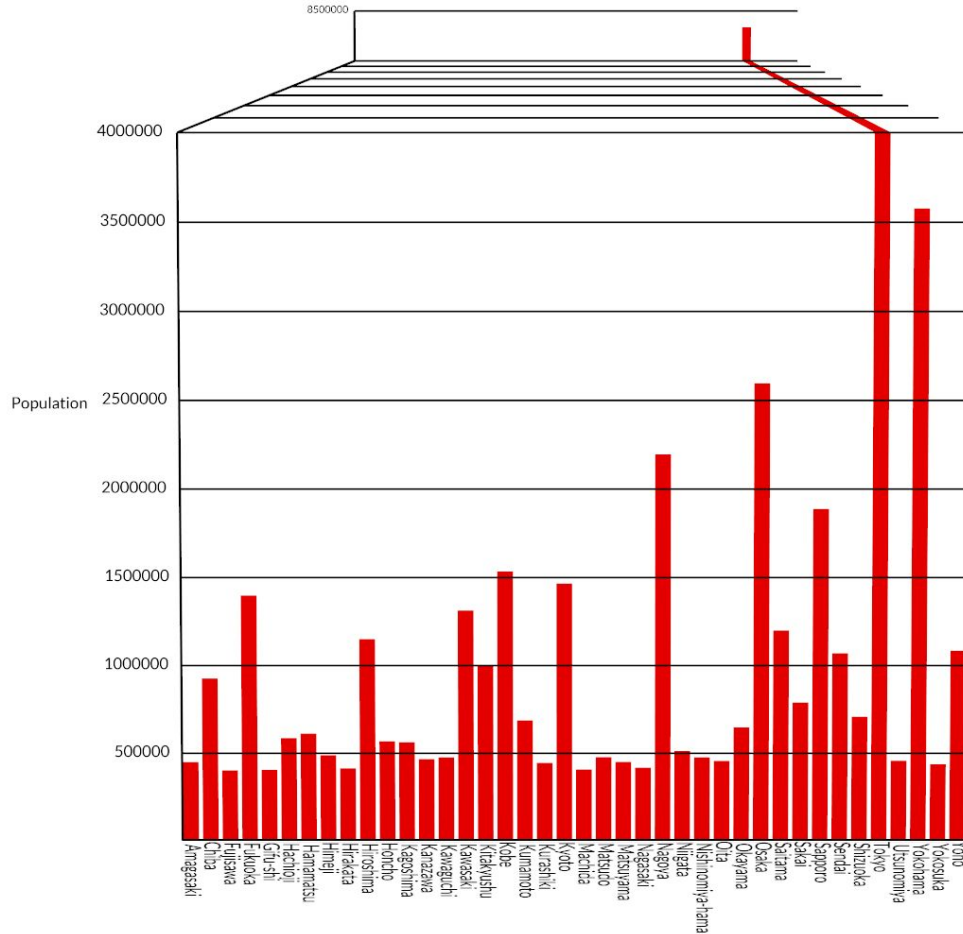
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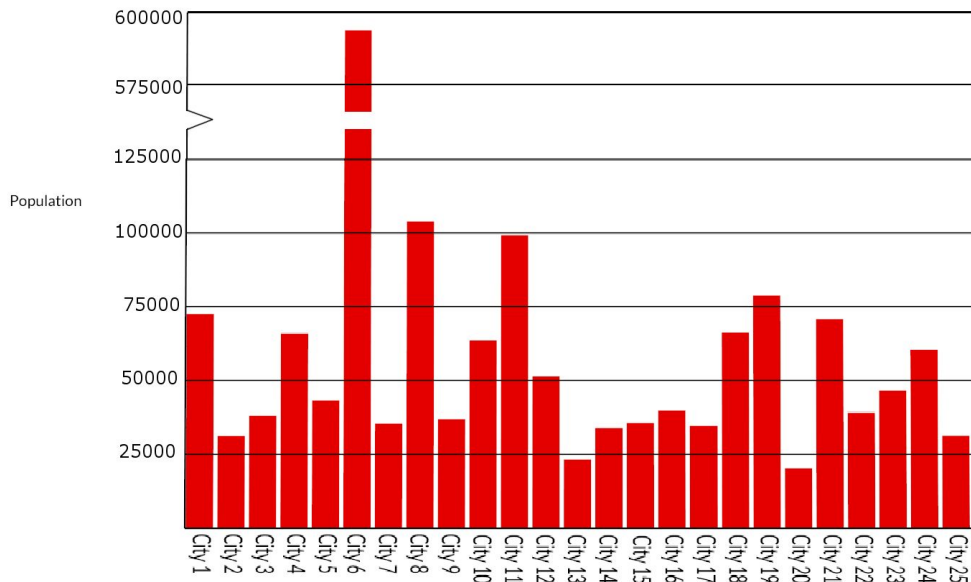
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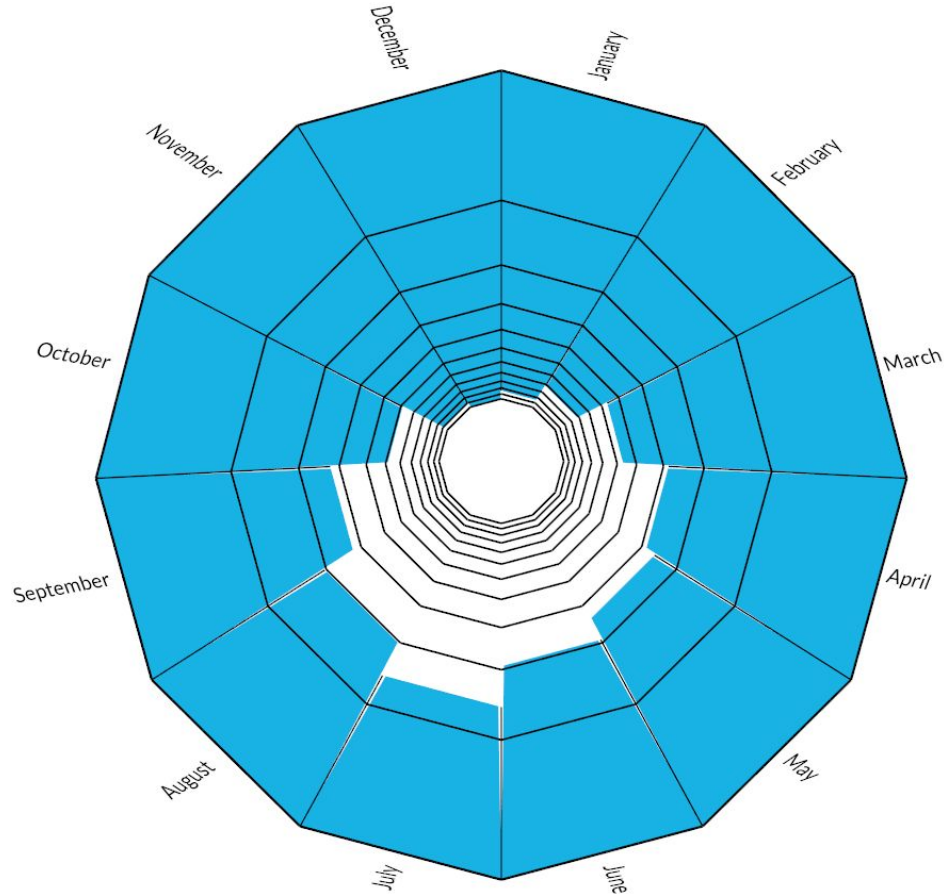
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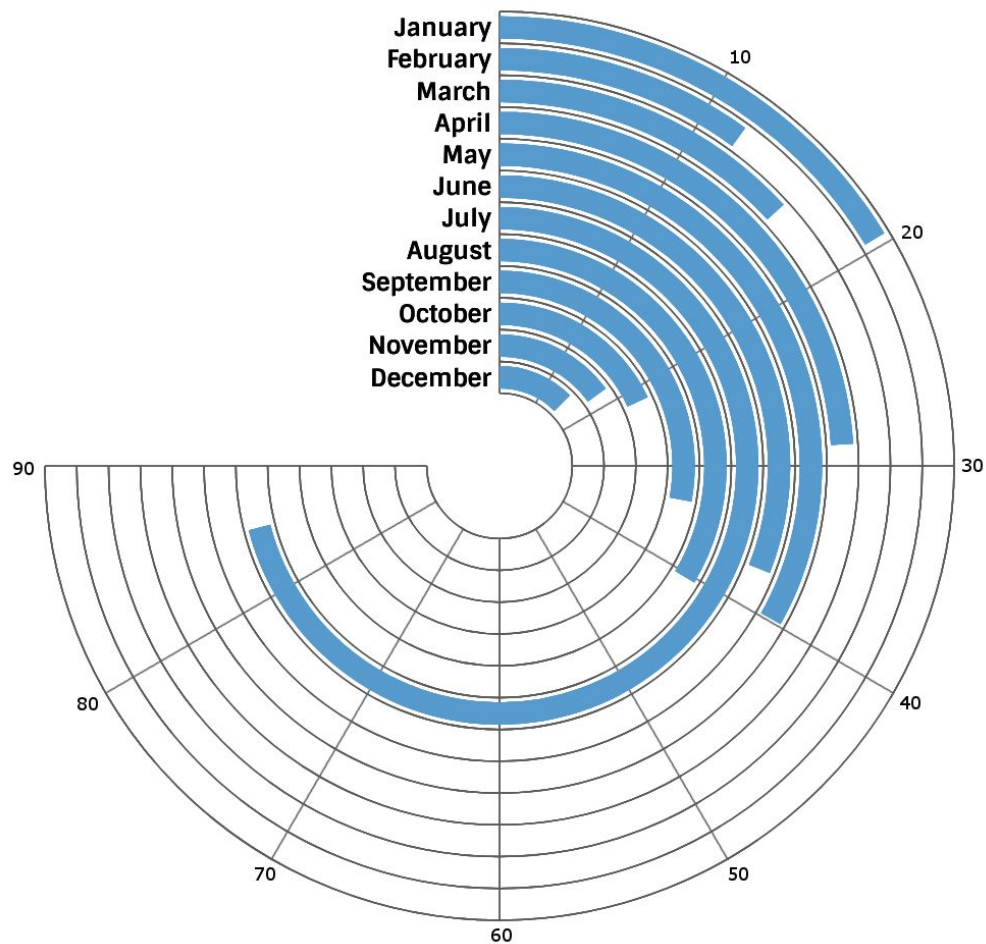
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7

Precipitation: One line equals 10 mm



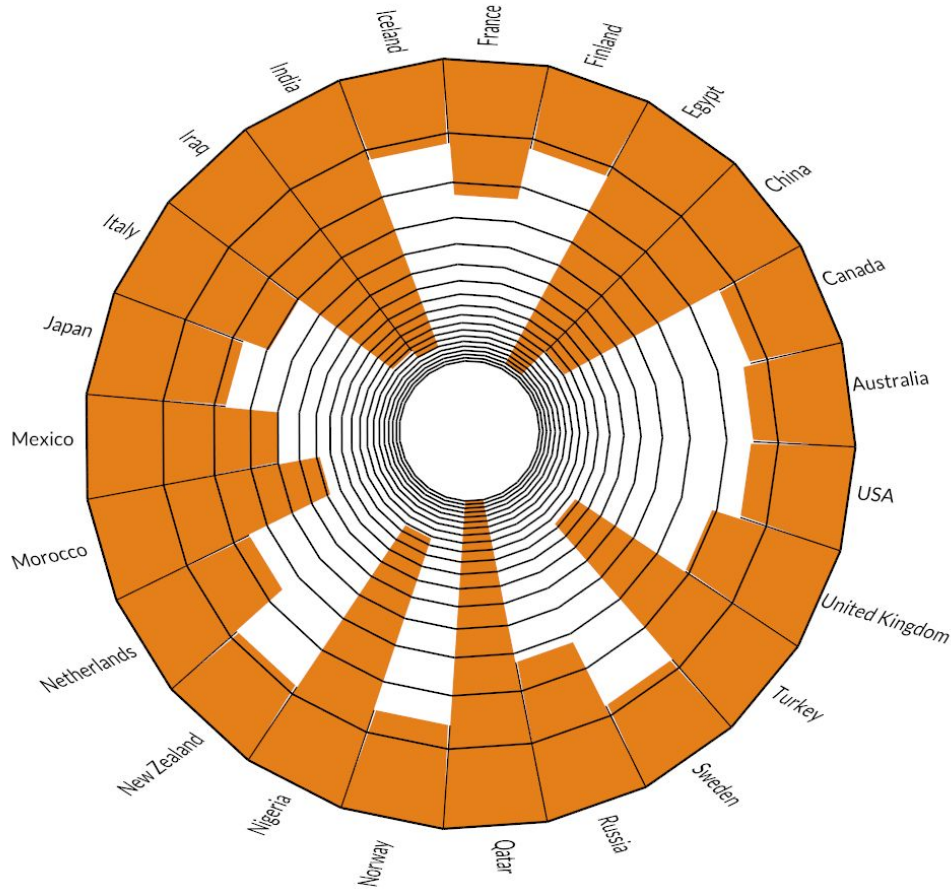
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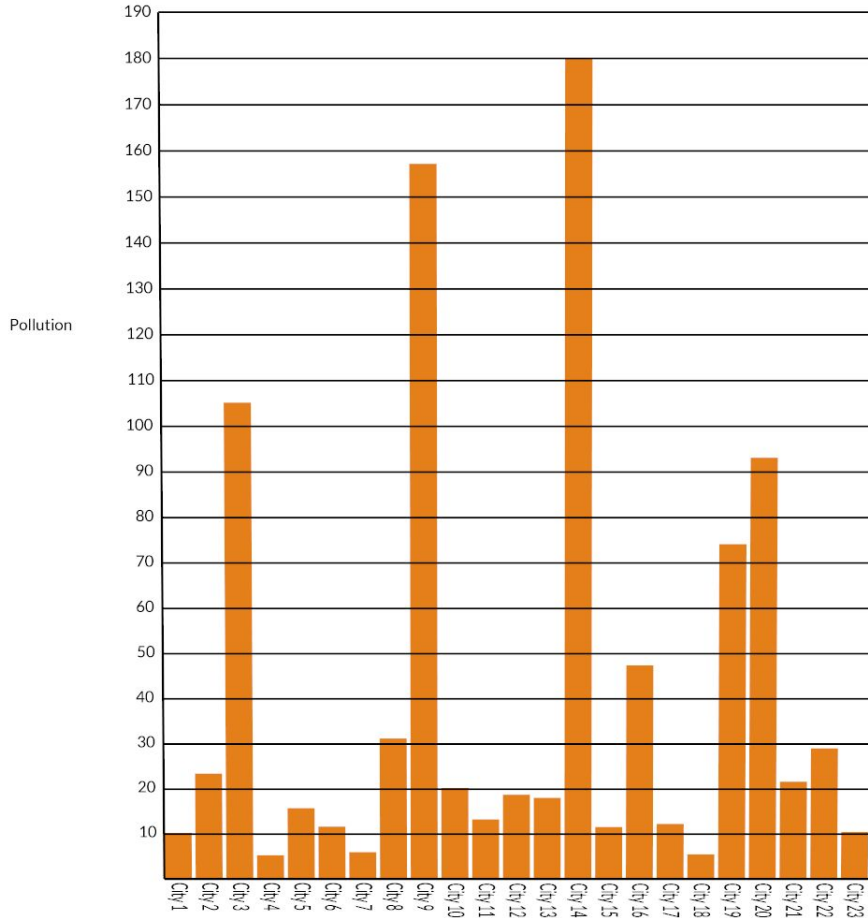
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9

Pollution: One line equals 5



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- Filter:** Which cities have pollution levels of less than 18.5 microns of fine particulate matter per square meter? (A: 1, 4, 5, 6, 7, 11, 13, 15, 17, 18, 23)