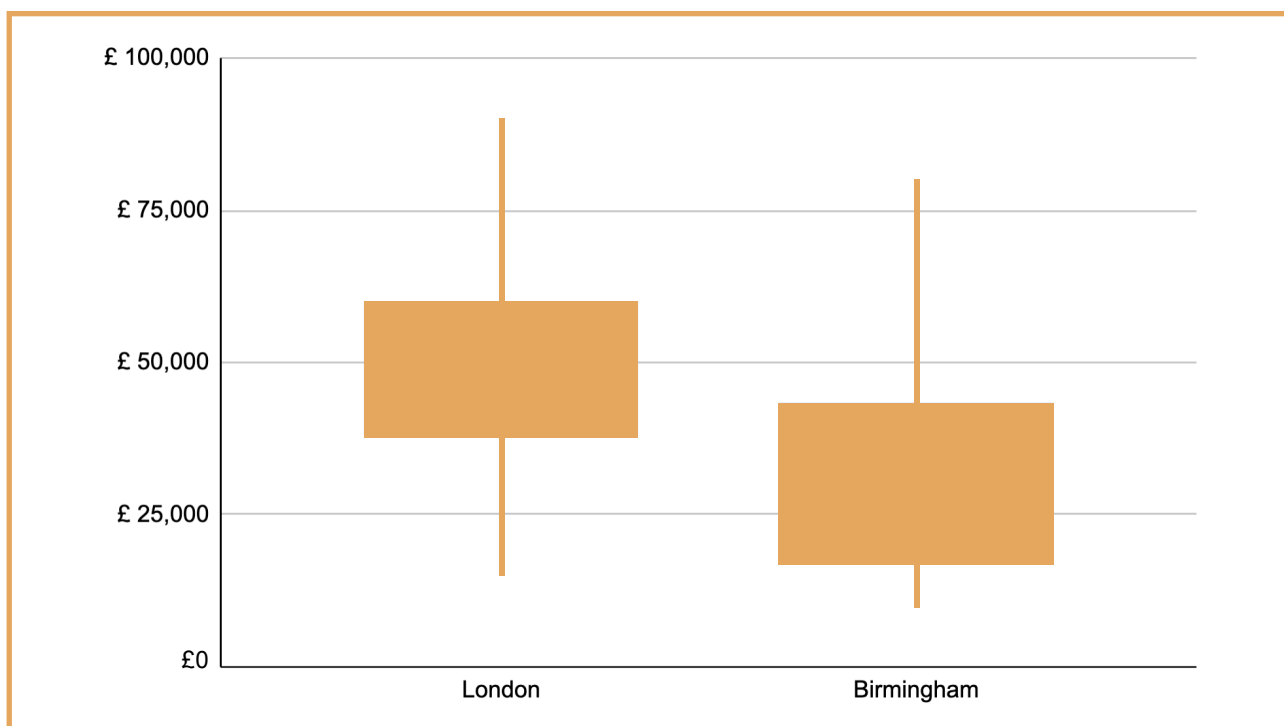# 31. Statistics

Comparing income distribution in various UK cities.

You are carrying out an economics project about regional incomes in the UK to learn what people can expect to earn depending on where they live. As part of your research, you notice that not only do people living in different cities earn rather different amounts, there are also differences between the cities in how different incomes are "distributed" within each city's population. You plot some box plots to visualise the income distributions of each of the relevant UK cities and better understand the data.

1. The box plots below show the distribution of annual incomes in London and Birmingham in 2022. Analyse the box plots and answer the following questions to compare the income distributions of the two cities.

a. Complete the following table using the data from the above box plots.

City	Min	Lower Quartile	Upper Quartile	Max
London				
Birmingham				

b. Using your answers from the previous question, what is the interquartile range for incomes in London and Birmingham?

c. Comment on the differences in income distribution between the two cities.

2. Ten people are sampled at random in Leeds and Newcastle, and asked to provide their annual income. The data is provided below:
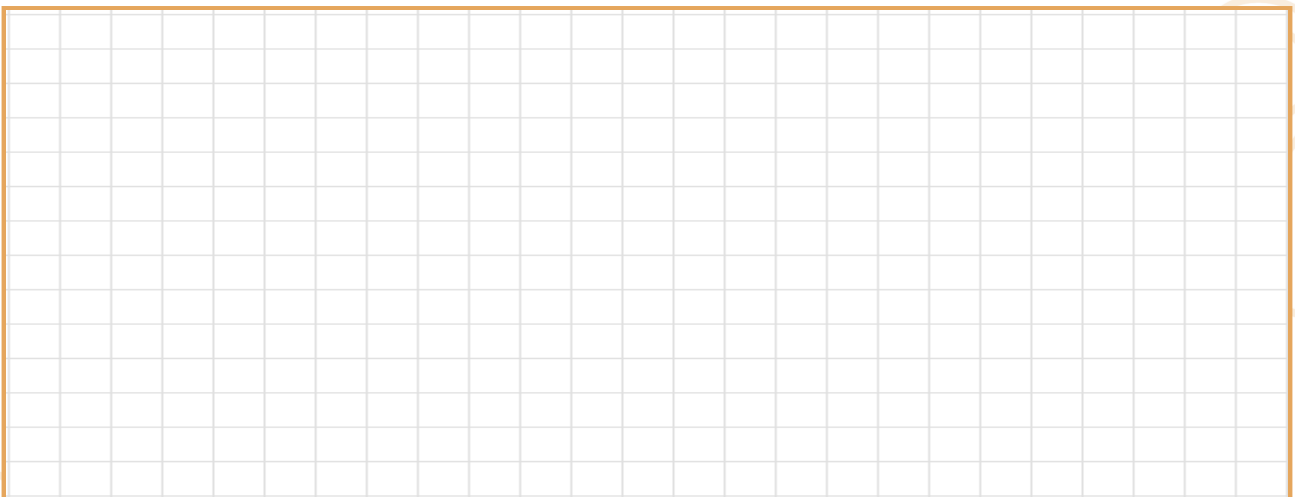
Leeds annual incomes (£'000): 32, 36, 35, 21, 26, 40, 85, 18, 43, 71
Newcastle annual incomes (£'000): 23, 39, 17, 63, 62, 31, 25, 36, 40, 21

Calculate the following data points for each city and plot this as a box plot graph on the next page.

Leeds:

a. Minimum:

b. Maximum:

c. Median:

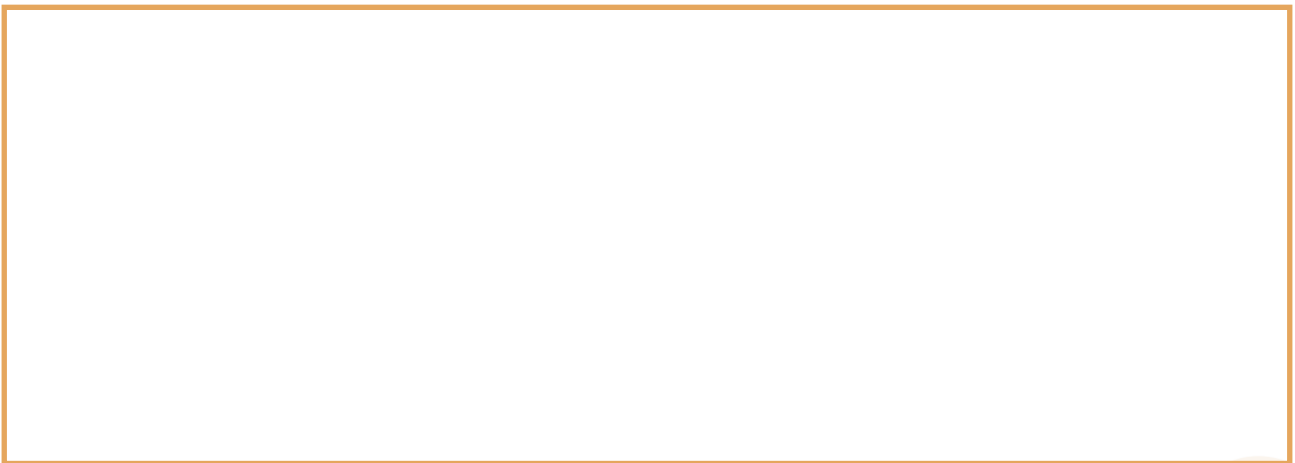d. Lower Quartile:

e. Upper Quartile:

f. Plot the box plot below.

Newcastle:

a. Minimum:

b. Maximum:

c. Median:

d. Lower Quartile:

e. Upper Quartile:

f. Plot the box plot below.

3. Comment on the income distributions of Leeds and Newcastle.