

Project EX-7: Interpreting Worksheets and Charts

In this project, you'll practice identifying simple trends and drawing conclusions based on tabular information and charts. You'll also try your hand at sorting, ranking, and filtering data.

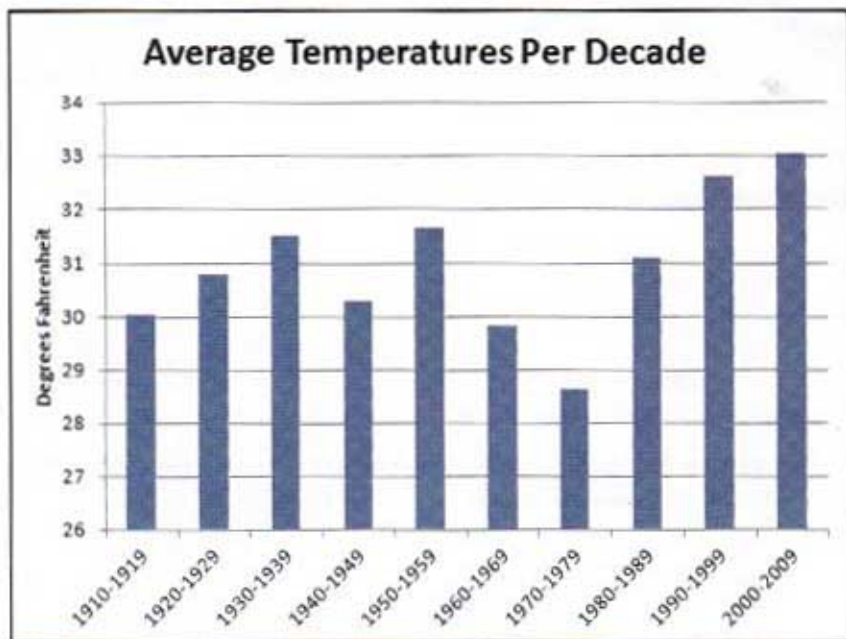
Requirements: This project requires Microsoft Excel.

Project file: PrjEX-7.xlsx

1. Copy the file PrjEX-7.xlsx to your Project folder using the Copy It! button on this page in the BookOnCD.
2. Start Microsoft Excel and open the file PrjEX-7.xlsx from your Project folder.
3. The worksheet contains raw data from the National Climatic Data Center. It is a 100-year record (1910–2009) of mean temperatures in the U.S. for the month of January. Examine the data. What would you guess is the average temperature for this 100-year period? Can you tell if temperatures seem to be increasing or decreasing?
4. To make it easier to analyze the data, highlight cells A3:B102 and use the Data tab's Sort button to arrange the temperatures in order from smallest to largest. The lowest temperature should be 22.57 in 1979. If your results are different, undo the sort and try it again, making sure to highlight both columns A and B.
5. Which year had the highest mean temperature and what was it?
6. Do all of the highest temperatures appear to have occurred in the last 50 years?
7. Suppose you'd like to answer the question "In which years was the average temperature greater than 34 degrees?" Select cells A2 and B2, which contain the Year and Temperature labels, respectively. Click the Data tab, and then click the Filter button. Click the arrow button in column B, select Number Filters, and then click Greater Than. Enter 34 and then click the OK button. How many years had temperatures above 34 degrees?
8. Clear the filter by clicking the Filter button again.
9. Now, sort columns A and B by year from smallest to largest.
10. In cell E3, calculate the average temperature and write it down. Do temperatures before 1920 appear to be above or below average?
11. To identify trends in the temperatures, enter formulas in column E to compute the average January temperatures for each of the ten-year intervals listed in the Decade column. Which decade appears to have the highest average January temperatures?
12. Excel can automatically rank the decades so that you can easily see which decade was the warmest, which was the second warmest, and so on. Click cell F6 and enter the formula `=RANK(E6, E6:E15)`. That formula should produce the number 8 to indicate that 1910–1919 was the eighth warmest decade. Copy the formula down through row 15. Which decade is ranked ninth?
13. Create a pie chart of the data in cells D6 through E15. Does that chart make sense? Change the chart type and look at the data formatted as a column chart, a scatter chart, and a line chart. Which chart best shows the temperature trends over time, and which one best lets you compare temperatures from one decade to the next?

14. Select the clustered column chart type once again. Use the Layout tab to add the chart title, *Average Temperatures Per Decade*, above the chart.

15. Add a vertical Y-axis title, *Degrees Fahrenheit*, using the Rotated Title option. Remove the "Series 1" legend from the chart. Format the vertical axis so the temperatures are displayed without decimal places. (Hint: Click the vertical axis, then select Format Selection in the Current Selection group on the Format tab.) Compare your chart to the example below.



16. Place the chart on Sheet2 and rename Sheet2 *Chart by Decade*.

17. Examine the chart to ensure that the spreadsheet data is accurately represented. One easy verification technique is to identify a data trend and see if the trend is shown both in the data and on the chart. A trend in this data is the trend for the lowest temperatures in the 1960s and 1970s, and the highest in the last 20 years. Verify that the column chart corresponds to this trend.

18. You can add a trendline to your chart using the Trendline button in the Analysis group on the Layout tab. Select Linear Trendline. According to this trendline, how would you characterize the temperature differences now compared to a hundred years ago?

19. To forecast trends based on your chart, right-click the line, then select Format Trendline to display the Format Trendline dialog box. Under Forecast, enter 2 in the Forward box. Based on the result, what would you expect as the average temperature for the decade 2020–2029?

20. Add your name to cell G1 on the first worksheet. Save your project using the file name PrjEX-7 XXXXX 9999, where XXXXX is your name or student ID number and 9999 is your class section number. Submit your project on a USB flash drive, as a printout, or as an e-mail attachment, according to your instructor's directions.