

Correlation_Between_Average_Temperature_And_Latitude_1999.txt

FROM

<http://www.mste.uiuc.edu/malcz/data/WEATHER/Temperatures.html>

US Temperatures

Data was taken from The Data and Story Library. For further information about the data, see The Data and Story Library <http://lib.stat.cmu.edu/DASL/> Web Page.

Return to the MSTE Data Archive

Reference: Peixoto, J.L. (1990) A property of well-formulated polynomial regression models. *American Statistician*, 44, 26-30. Also found in: Hand, D.J., et al. (1994) *A Handbook of Small Data Sets*, London: Chapman & Hall, 208-210.

Description: The data gives the normal average January minimum temperature in degrees Fahrenheit with the latitude and longitude of 56 U.S. cities. (For each year from 1931 to 1960, the daily minimum temperatures in January were added together and divided by 31. Then, the averages for each year were averaged over the 30 years.)

Number of cases: 39

Variable Names:

A.City: City, State postal abbreviation

B.JanTemp: Average January minimum temperature in degrees F. from 1931-1960

C.Lat: Latitude in degrees north of the equator

D.Long: Longitude in degrees west of the prime meridian

To download this data into an Excel spreadsheet, click on US Temperatures.

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City	Temperature	Latitude	Longitude
"Mobile, AL"	44	31.2	88.5
"Phoenix, AZ"	35	33.6	112.5
"Los Angeles, CA"	47	34.3	118.7
"San Francisco, CA "	42	38.4	123
"Denver, CO"	15	40.7	105.3
"Washington, DC"	30	39.7	77.5
"Miami, FL"	58	26.3	80.7
"Atlanta, GA"			

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	37	33.9	85
"Boise, ID"	22	43.7	117.1
"Chicago, IL"	19	42.3	88
"Indianapolis, IN"	21	39.8	86.9
"Louisville, KY"	27	39	86.5
"New Orleans, LA"	45	30.8	90.2
"Portland, ME"	12	44.2	70.5
"Baltimore, MD"	25	39.7	77.3
"Boston, MA "	23	42.7	

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"Detroit, MI "	21	71.4
"Minneapolis, MN"	2	43.1
"St. Louis, MO"	24	83.9
"Helena, MT"	8	45.9
"Omaha, NE"	13	93.9
"Albuquerque, NM"	24	39.3
"New York, NY"	27	90.5
"Charlotte, NC "	34	47.1
"Bismarck, ND"		112.4

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0	47.1	101
"Cincinnati, OH"	26	39.2
"Cleveland, OH "	21	42.3
"Seattle, WA"	33	48.1
"Milwaukee, WI"	13	43.3
"Cheyenne, WY"	14	41.2
		104.9

<http://ww2.sofweb.vic.edu.au/cgi-win/search.exe/BROWSEITEM?LVL=2&ID=1243>

Correlation between average temperature and
latitude for cities in USA

Abstract:

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Students download real data from the Internet in the form of an excel spreadsheet and find a line of good fit.

Prerequisites:
(Requirements prior to activity)

Students should have some knowledge of lines of good fit, and some experience using a spreadsheet.

Resources Needed:
Computer lab with access to internet and excel spreadsheets

URL1:

<http://www.mste.uiuc.edu/malcz/data/WEATHER/Temperatures.html>

Activity:

Students go to web site URL1 and download the excel file from page to disk (very fast download time). They then start Excel, open the downloaded file and highlight the average temperature and latitude columns (columns B and C, this is not clear from downloaded file but can be verified using the data read from the web page).

Students use the data to create a scatter graph and determine the line of good fit. Students could print out the scatter graph and find their own line of good fit as well as using the spreadsheet line of best fit feature. They should determine the equation of their hand drawn line of good fit.

Students should also interpret their graph and discuss it's features, for example, which city produces an outlier.

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Students can also use the spreadsheet to convert the temperature data from Fahrenheit to Celsius using the formula "F = 1.8C + 32" and then use the Celsius data to create their scatter plot. This makes the data more familiar.

Learning Outcomes:

Mathematics:Chance and Data:6
MACD565 - Makes statements about the association between bivariate variables
MACD564 - Reports on his or her displays and summaries
MACD563 - Interprets data from prepared databases
MACD4612 - Uses appropriate computer software to produce a scatter plot
MACD4610 - Draws a line of good fit to a scatter plot by eye
MACD4609 - Represents bivariate data in a scatter plot
MACD4605 - Identifies outliers in data sets
MACD3606 - Collects bivariate data

Comments:

This real data produces a good linear trend with one outlier. The data gives the normal average January minimum temperature in degrees Fahrenheit with the latitude and longitude of 56 U.S. cities. (For each year from 1931 to 1960, the daily minimum temperatures in January were added together and divided by 31. Then, the averages for each year were averaged over the 30 years.)

Acknowledgements:

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Nil

Other benefits
for students:
between two variables.

Students use real data to test for a relationship