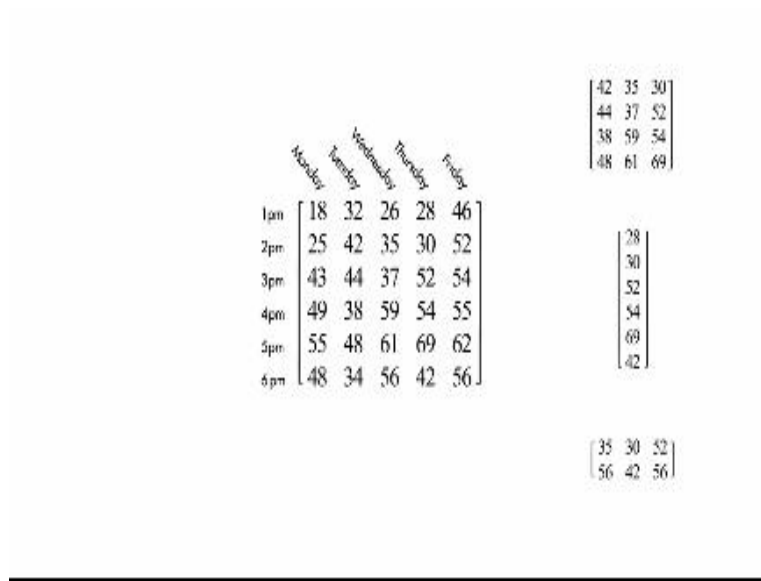# Accessing Elements of a Matrix

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Often we have a larger data set than we need and really only want to analyze a subset of our data here we have pollution readings where columns represent days of the week and rows keep track of the time. We want to understand pollution levels by looking at data from different times and days how can we extract subsets of a matrix for analysis.

Elements of a matrix have a row index defined by the row number and a column index defined by the column number. For instance, the element in row 5 column 3 has indices 5, 3 to access this element we include both the row index then the column index separated by a comma and enclosed in parentheses.

But how would we extract a larger subset of a matrix say the data that are in both rows 1 and 5 and in columns 2 to 4 instead of accessing each element one by one will access all of these elements at the same time. To do this will first create vectors specifying the row indices and column indices we need to extract.

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So here the variable row is a two element vector of our desired row indices and the variable calls is a three element vector of our column indices which we enclose in parenthesis. And look at that the result is a 2 by 3 matrix containing exactly the subset of data we wanted.

When analyzing data you might find yourself needing to extract an entire row or column extracting a whole row or column of data is so common there is a shortcut. A single colon references all of the elements in that dimension together that is better here the colon in the row dimension indicates that we want all of the rows and the one in the column dimension references the first column. And now that we have only the data we need we can continue our analysis.

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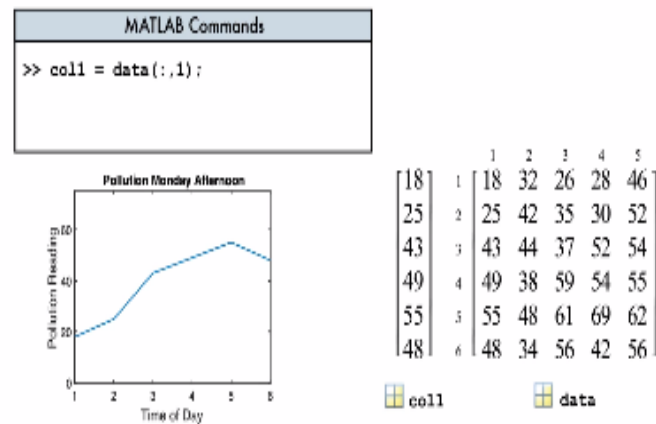
Because the first column represents readings on a Monday we can conclude pollution levels rise quite a bit on this weekday afternoon.

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