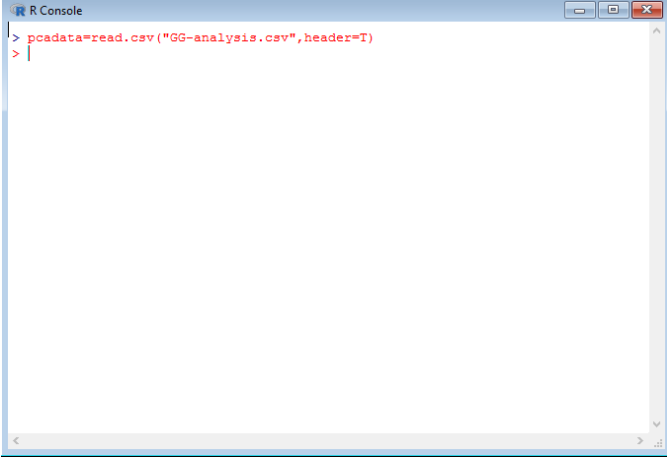

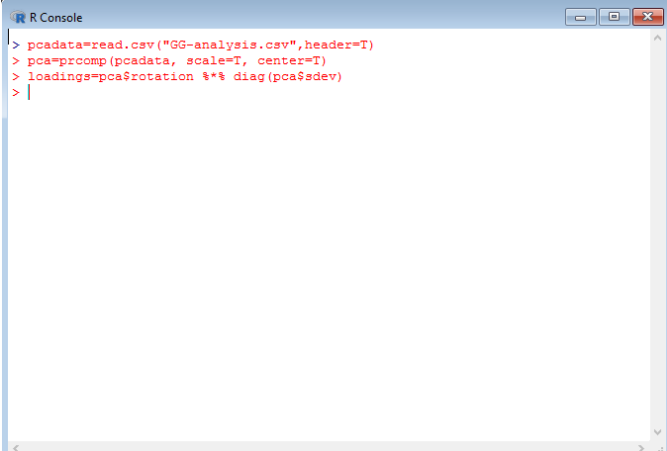


# R-Programming Fundamentals for Business Students — Principal Components Analysis in R

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<ul style="list-style-type: none"><li>Type <code>pcadata=read.csv("filename", header=T)</code></li></ul> <p>Notes: <code>read.csv</code> reads your datafile into R. I used <code>GG-analysis.csv</code> as the file name. This is a comma-separated file that I exported from Excel, with headers denoting the survey questions (categories) and each row denoting a response—with no row names.</p> <p>See tutorial 5 if you've never exported a file from Excel and imported it into R.</p>	 <pre>R Console &gt; pcadata=read.csv("GG-analysis.csv",header=T) &gt;  </pre>
<ul style="list-style-type: none"><li>Type <code>pca=prcomp(pcadata, scale=T, center=T)</code></li></ul> <p>Notes: <code>prcomp</code> does the principal components analysis on the <code>pcadata</code> frame read in the previous step. The parameter <code>center</code> mean-centers the values and <code>scale</code> makes the variables have unit variance.</p>	 <pre>R Console &gt; pcadata=read.csv("GG-analysis.csv",header=T) &gt; pca=prcomp(pcadata, scale=T, center=T) &gt;  </pre>
<ul style="list-style-type: none"><li>Type <code>loadings=pca\$rotation %*% diag(pca\$sdev)</code></li></ul> <p>Notes: The command <code>prcomp</code> in the previous step returns the sqrt of the eigenvalues in <code>\$sdev</code> and the unit eigenvectors in <code>\$rotation</code>.</p> <p>You must load the eigenvectors with the sqrt of the eigenvalues before performing a rotation. This command does the loading using matrix multiplication <code>%*%</code>.</p>	 <pre>R Console &gt; pcadata=read.csv("GG-analysis.csv",header=T) &gt; pca=prcomp(pcadata, scale=T, center=T) &gt; loadings=pca\$rotation %*% diag(pca\$sdev) &gt;  </pre>

