Abstract

The purpose of this research is to compare the reliability of five software packages for statistical analysis. The computation is consisting of univariate summary statistic, one-way analysis of variance, and linear regression analysis. There are two types of software packages; user programming (SAS 9 and R 2.6.2) and package program (Microsoft Excel 2007, SPSS 15, and Minitab15). The reference data set provided by The National Institute of Standards and Technology (NIST) which datasets are ordered by level of difficulty (lower, average, and higher) at 15 significant digits are used. The accuracy of statistical approximation are measured based on univariate summary statistic compare by mean and standard deviation, one-way analysis of variance compare by F-statistic and mean square error, and regression analysis compare by F-statistic and coefficient of regression.

The result of univariate summary statistic show that there is high level of accuracy from five software packages. However, the accuracy of standard deviation is high when level of difficulty is low or vice versa. For one-way analysis of variance, there is no difference among SAS 9, R 2.6.2, Microsoft Excel 2007, and SPSS 15 and the accuracy of F statistic and mean square error depend on observations and level of difficulty. Obviously, the accuracy level from SPSS 15 and Microsoft Excel 2007 decreases when the constant leading digits increase. Only if the level of difficulty is low or medium is the accuracy level of Minitab 15 high due to the limitation of the program that it cannot provide more than 15-digit result. For the regression analysis, the accuracy of F statistic of SAS 9, R 2.6.2, and Microsoft Excel 2007 is high while the accuracy of SPSS 15 and Minitab 15 drops when the level of difficulty increases. The level of accuracy of coefficient of regression of five software packages is high when the level of difficulty is low or medium. When the level of difficulty is high, SAS 9, R 2.6.2, Microsoft Excel 2007, and Minitab 15 show no difference in the result; however, SPSS 15 has obviously low accuracy level.