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Application of “one sample t-test” by using SPSS for conducting physical education researches

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Abstract

Comparative studies are the most commonly conducted studies. Researchers apply different types of statistical tools to compare different groups or different observations. One sample t-test is a statistical technique used to compare a group with a specified constant. In the field of physical education, norms or a target is available, so we researcher can compare a group with a normative value or with a target. The assumption of normality is required to apply this statistical technique, since it comes under the category of parametric technique. If the assumption of normality is not fulfilled, parallel non-parametric technique is applied.

Keywords: One sample t-test, normality, specified constant

Introduction

Prologue

In Independent t-test, only one sample (one group) is required. Assumption is same as independent t-test i.e. data should be normally distributed. In this statistical technique, a group is compared with a specified constant or a target or a norm or a fixed value. In the field of Physical Education, there are multiple use of this statistical technique. We may compare the performance of a group with a model performance.

Example

A researcher wants to compare the blood glucose level of Pt. Ravishankar Shukla University females with a specified constant i.e. 80.

S. No.	Blood glucose level of Pt. Ravishankar Shukla University females	Specified Constant
1.	81	80
2.	79	
3.	82	
4.	83	
5.	84	
6.	81	
7.	82	
8.	82	
9.	81	
10.	83	
11.	84	
12.	81	
13.	82	
14.	81	
15.	83	
16.	82	
17.	81	
18.	82	
19.	83	
20.	84	

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Objective

The objective is to find out the significant difference between the “blood glucose level” of Pt. Ravishankar Shukla University females and the “specified constant” (80).

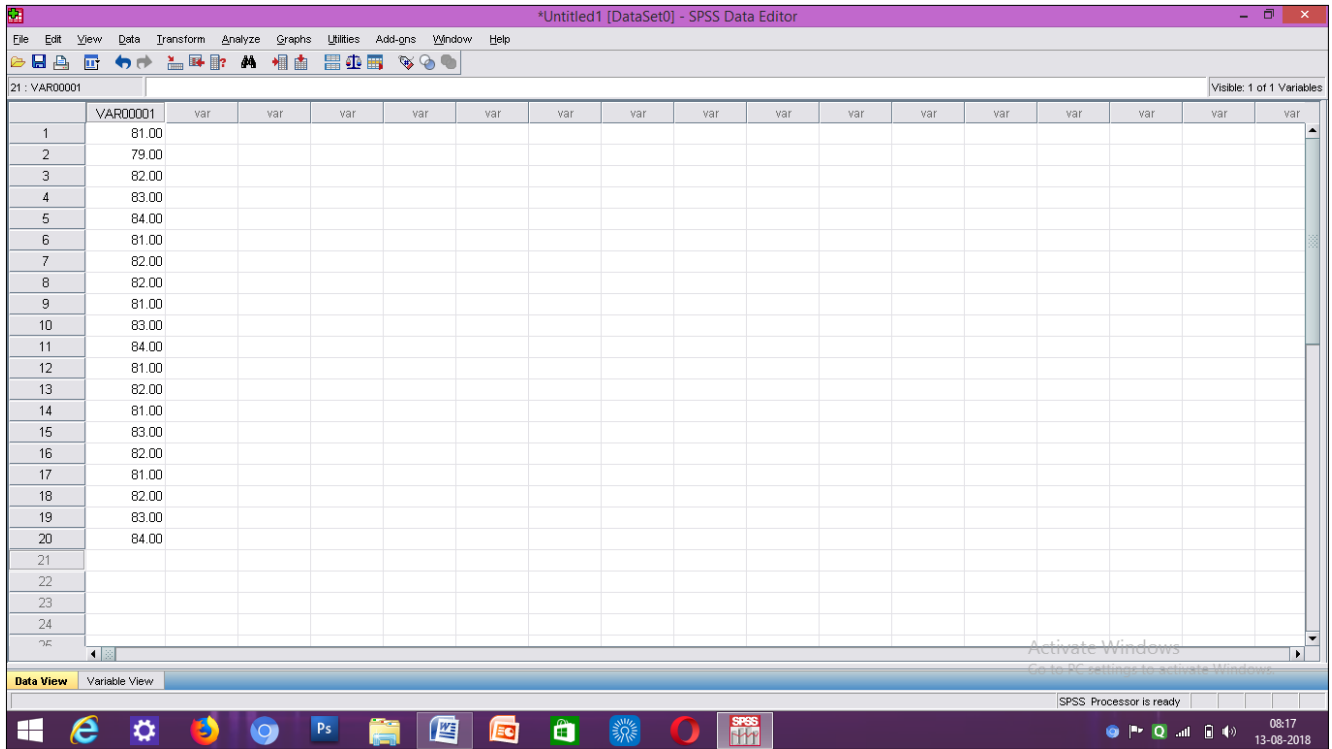
Hypothesis

It is hypothesized that, no significance difference will be found between the “blood glucose level” of Pt. Ravishankar Shukla University females and a “specified constant” (80).

$$H_0: \mu^1 = \mu^2$$

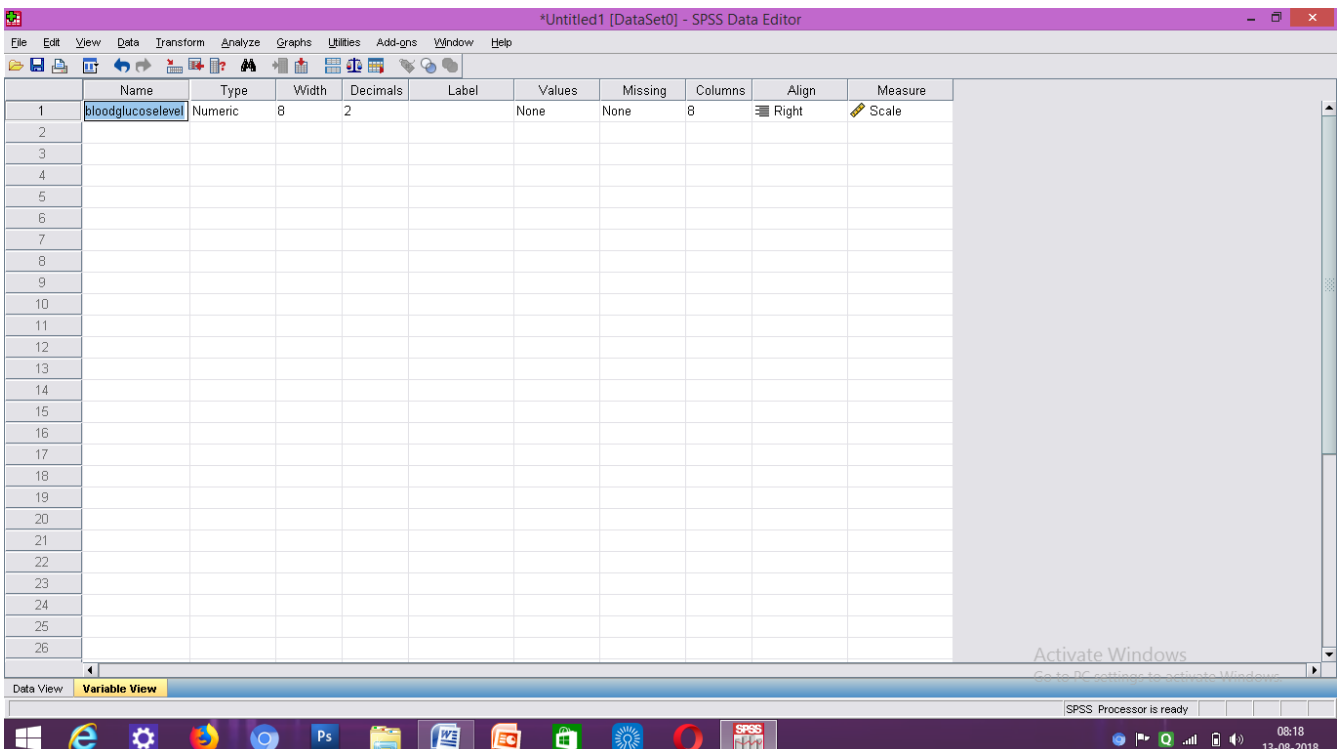
Analysis

1. In data view, only one column is used to feed data.



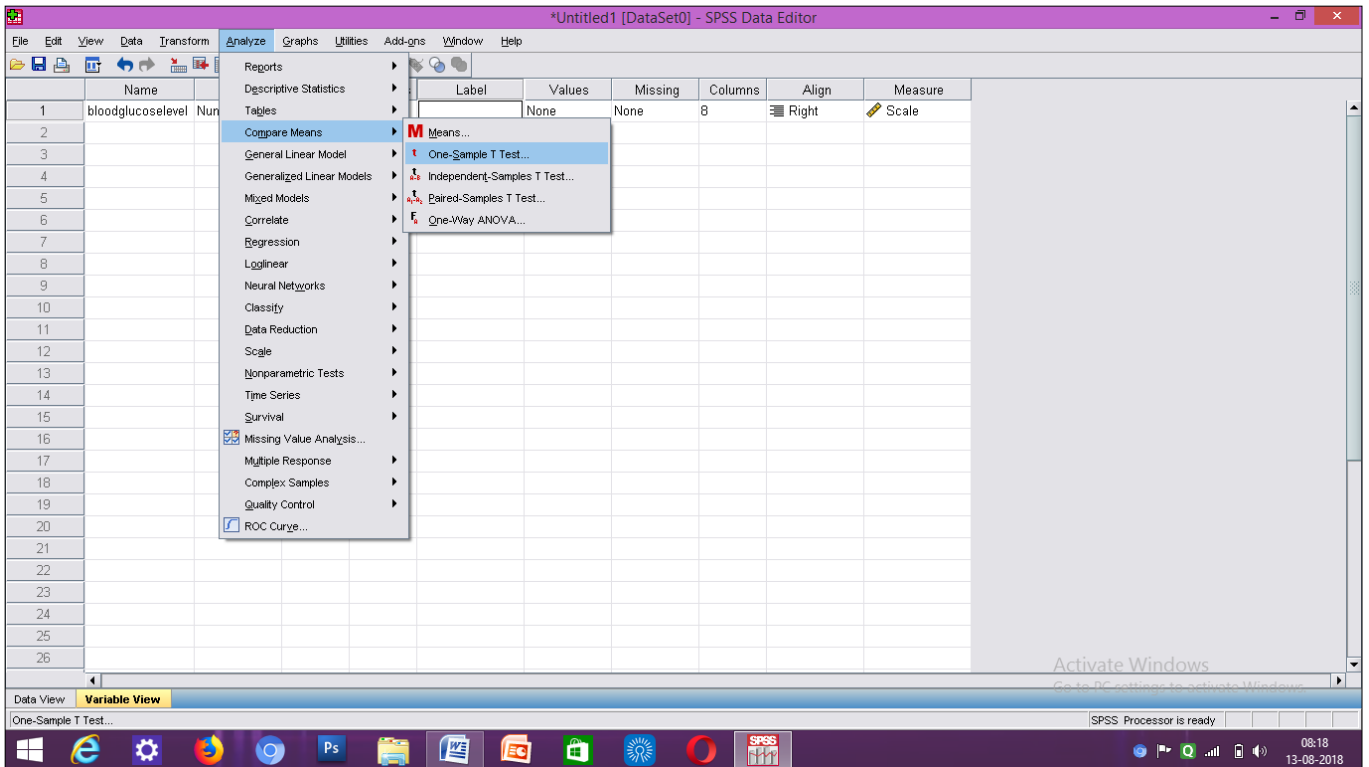
Template 1: Data entry.

2. In variable view, give name to first column i.e. “blood glucose level”.



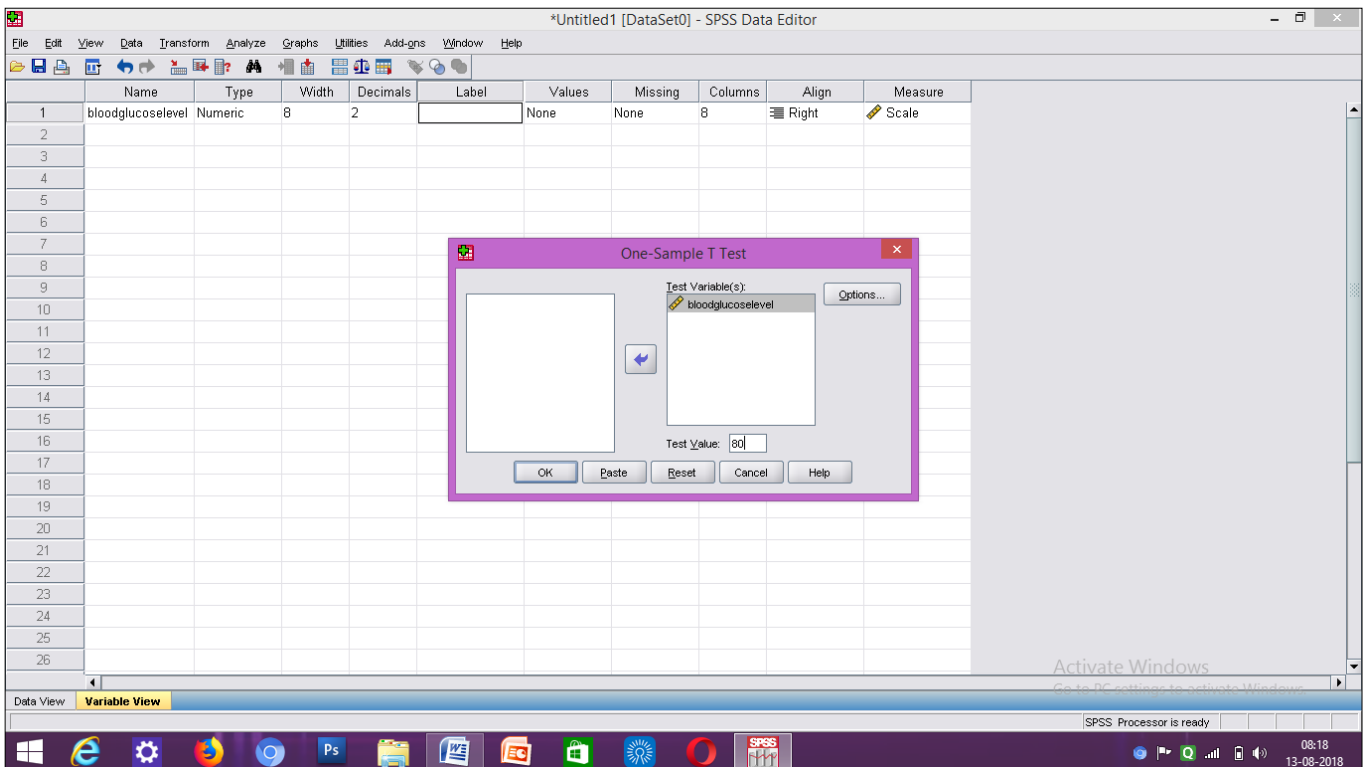
Template 2: Naming columns in variable view.

3. Go to Analyze → Compare means → One Sample T-test



Template 3: One Sample T-test

4. Enter “Blood glucose level” in “Test Variable (s)” and type specified constant in “Test Value” (80).



Template 4: Selection of “Test Variable (s)” and “Test Value”.

5. Click on Ok, the output will appear.

The screenshot shows the SPSS Viewer window with the following content:

```
T-TEST
  /TESTVAL=80
  /MISSING=ANALYSIS
  /VARIABLES=bloodglucoselevel
  /CRITERIA=CI(.9500).
```

T-Test

[DataSet0]

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
bloodglucoselevel	20	82.0500	1.27630	.28539

One-Sample Test

	Test Value = 80				95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
bloodglucoselevel	7.183	19	.000	2.05000	1.4527	2.6473

Activate Windows
Go to PC settings to activate Windows.

Template 5: Output of “One Samples T-Test”.

Interpretation of results

Interpretation of results will be on the basis of obtained t-value. If t-value is significant at .05 ($p < .05$) level of significance; significant difference occurs otherwise no significant difference occurs between a “group” and a “specified constant”. In this hypothetical example obtained “t-value” (7.183) is significant ($p < .05$) at .05 level of significance, significant difference occurs between the “blood glucose level” of Pt. Ravishankar Shukla University females and a “specified constant” i.e. 80, hence formulated hypothesis is not accepted. Pt. Ravishankar Shukla University females possess higher “blood glucose level” in comparison of “specified constant”.

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