Please write up hypotheses and necessary results, copy and paste SPSS output into a word file, and interpret the test results. Please do not copy and paste screenshots.

1. Independent samples t-test on “caffeine” data (caffeine.sav posted on blackboard) (total 5 points)

A total of 18 male volunteers participated in a study of the effect of caffeine on muscle metabolism. Nine participants were randomly assigned to take a capsule containing pure caffeine one hour before the test. The other 9 participants men received a placebo capsule.

During each arm exercise, the subject's respiratory exchange ratio (RER) was measured. (RER is the ratio of CO2 produced to O2 consumed and is an indicator of whether energy is being obtained from carbohydrates or fats).

Assume the data are normally distributed.

Questions:

1. Is RER the same for the caffeine takers and the placebo takers? Formulate the null and alternative hypotheses (2 points);
2. set an alpha value (2-tailed); conduct an independent samples t-test on the data file “caffeine;” report the t test statistic, degree of freedom, and p value; Copy and paste your results into the same word file (2 points).
3. Interpret your results (whether to reject the null hypothesis) (1 point).
4. Open the bodyfat\_student.sav data set in SPSS (total 15 points).

Questions:

1. Run descriptive statistics on age, body fact, weight, and height, including mean, median, standard deviation, standard error of the mean, min, max, quartiles. (3.5 points) Hint: use analyze🡪descriptive statistics🡪frequencies; then click the statistics you want.
2. Calculate BMI (hint: transform🡪compute variables)

Formula: BMI= weight (kg) / [height (m)2]

BMI= 703 x weight (lbs) / [height (in)2]

Report the mean and standard deviation of BMI (2 points)

1. Recode BMI into an ordinal variable named BMI\_C, following the rules below:
   1. If BMI <18.5, then BMI\_C=1 (underweight).
   2. If 18.5 <= BMI <25, then BMI\_C=2 (normal).
   3. If 25.0 <= BMI <30, then BMI\_C=3 (overweight).
   4. If BMI >= 30.0, then BMI\_C=4 (obese).

Run the frequency distribution of BMI\_C (1 point) and interpret it (1 point).

Hint: use transform🡪recode into different variables

1. Correlate (Hint: Analyze🡪 correlate)

bodyfat with age; bodyfat with BMI; bodyfat with abdomen\_in; bodyfat with hip\_in. Copy and paste SPSS output; interpret the results (2 points).

Are these correlations strong, moderate, weak, or close to zero? (1 point)

1. Recode age into a categorical variable (age groups) named age\_c:

If 20<=age<=39 years then age\_c=1

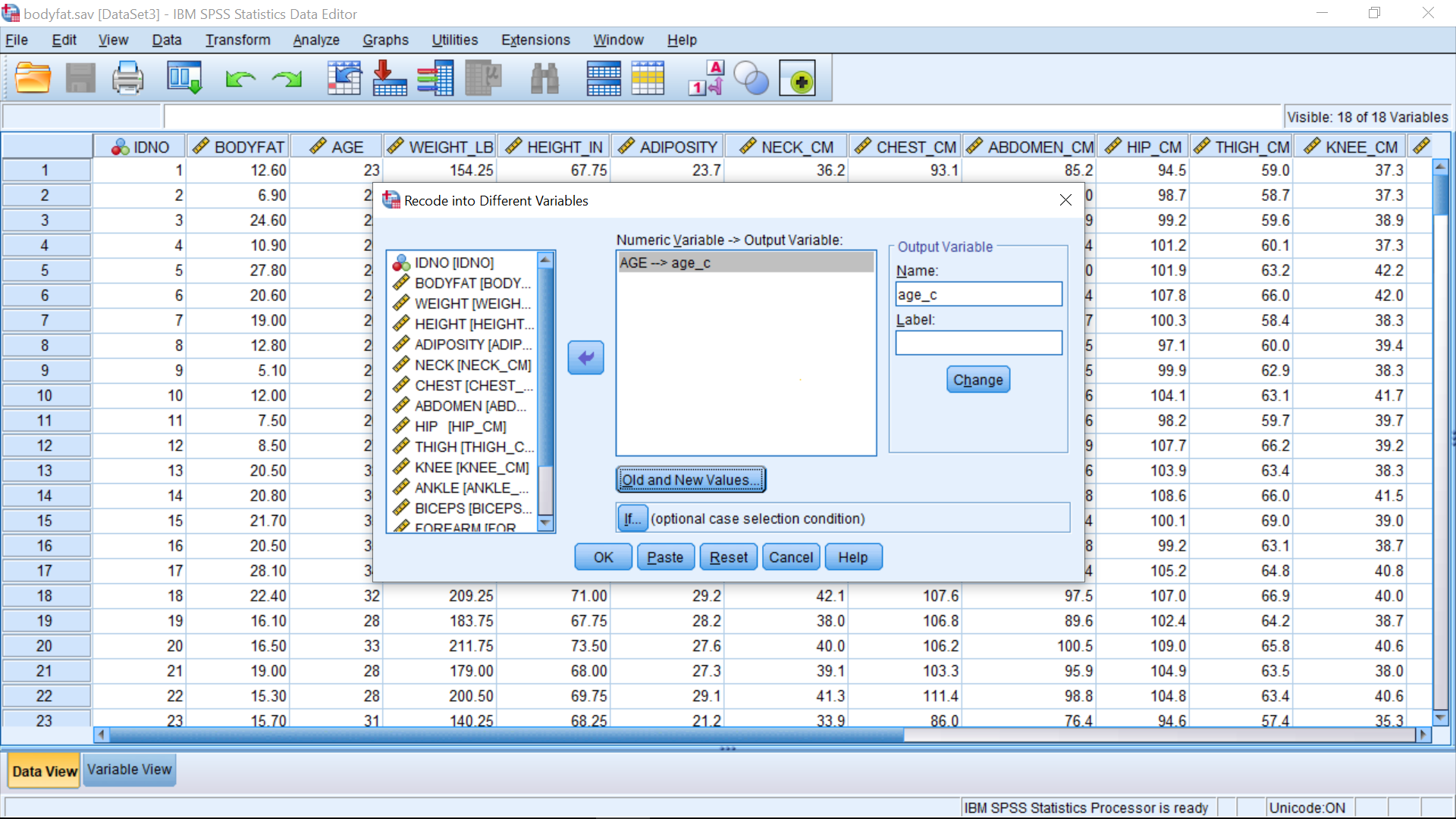
If 40<=age<=59 years then age\_c=2

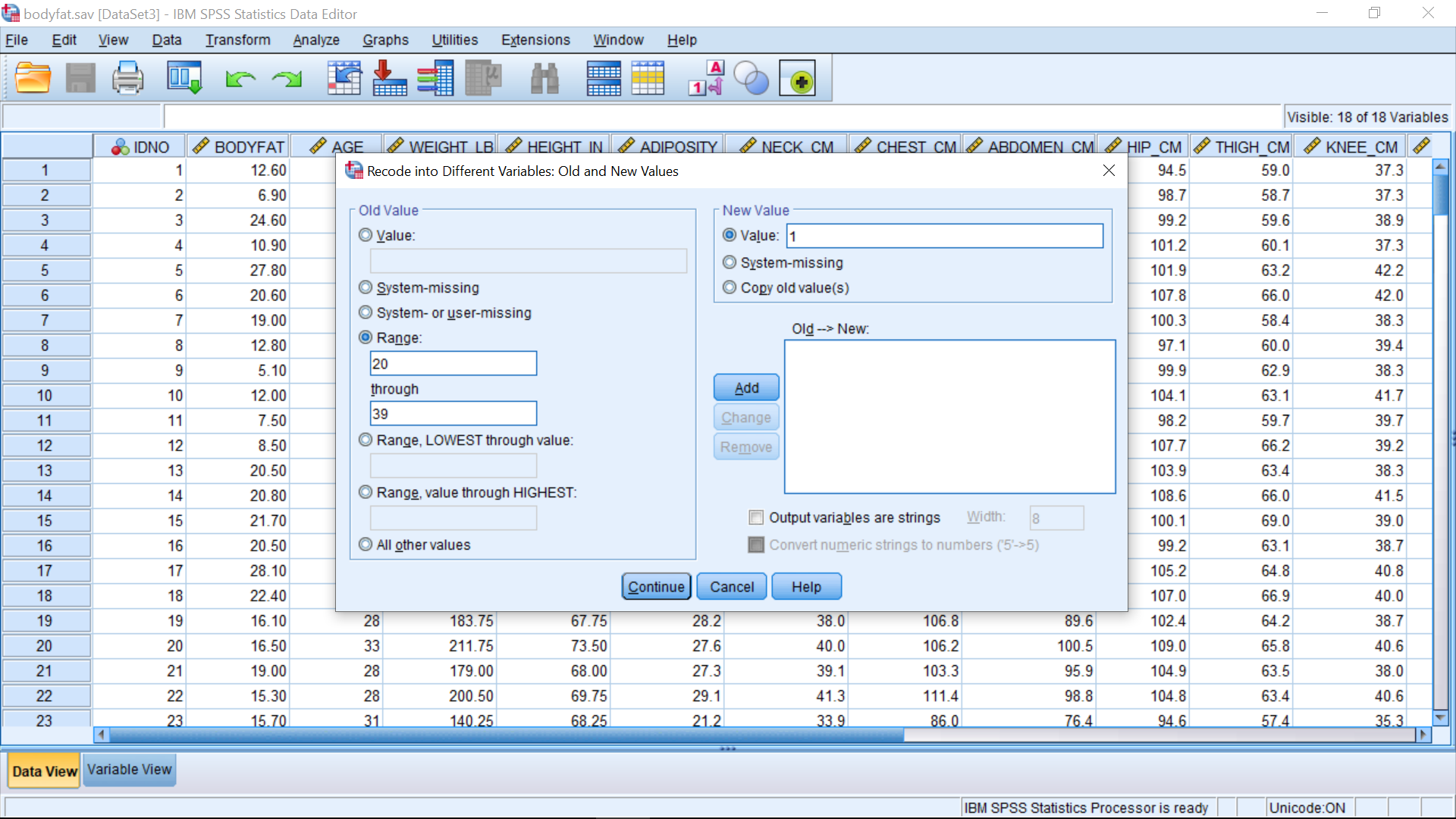
If 60<=age<=79 years then age\_c=3;

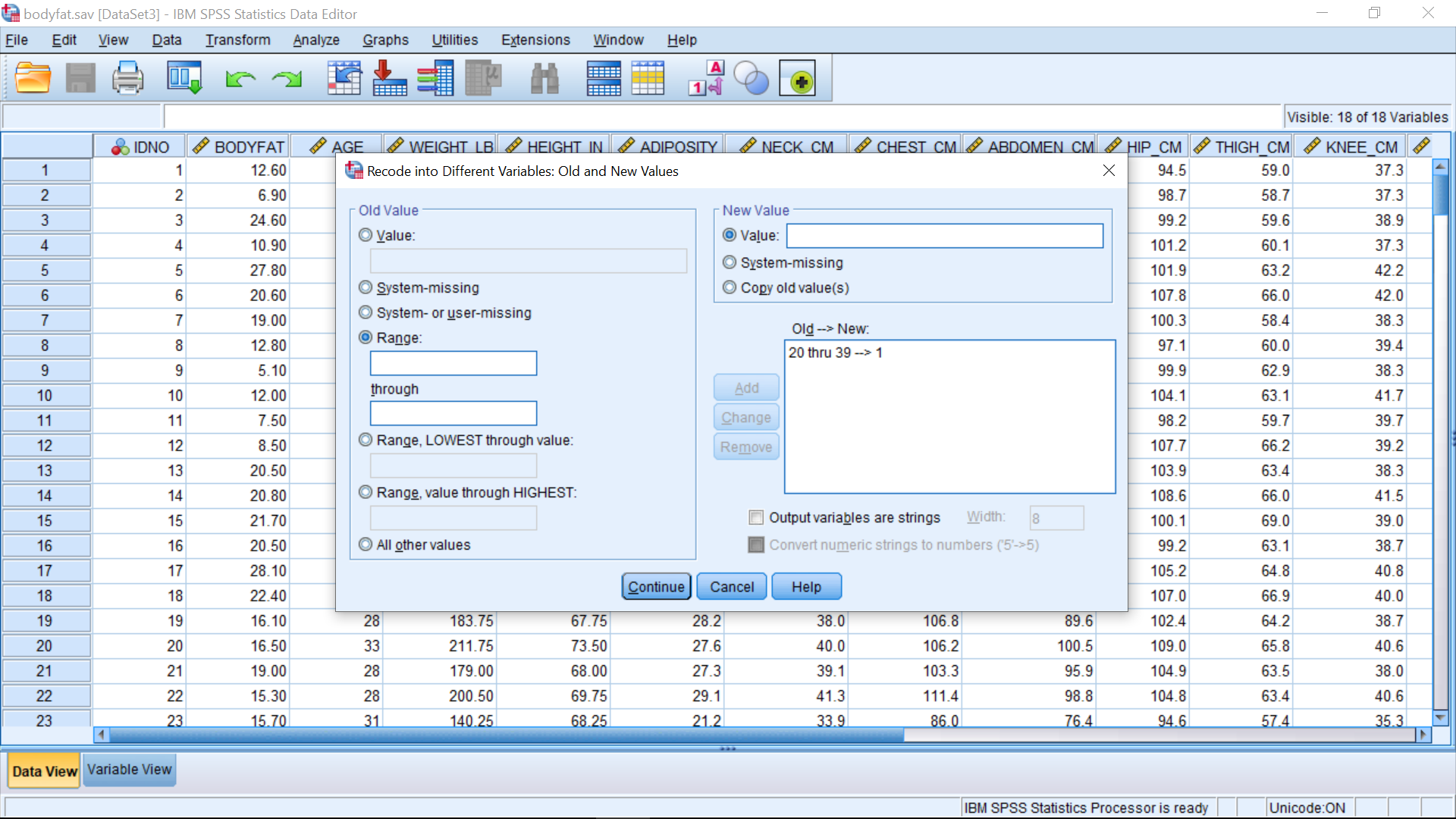
Calculate BMI for each age group, including mean, standard deviation, min, max, and standard error of the mean. (2.5 points)

1. Create a boxplot for bodyfat by age groups (1 point); (Graphs🡪legacy dialogs🡪boxplot)
2. Create error bars with mean and 95%Cis for bodyfat by age groups (1 point). (Graphs🡪legacy dialogs🡪error bars)
3. When recoding variables, use the recode command under transform.

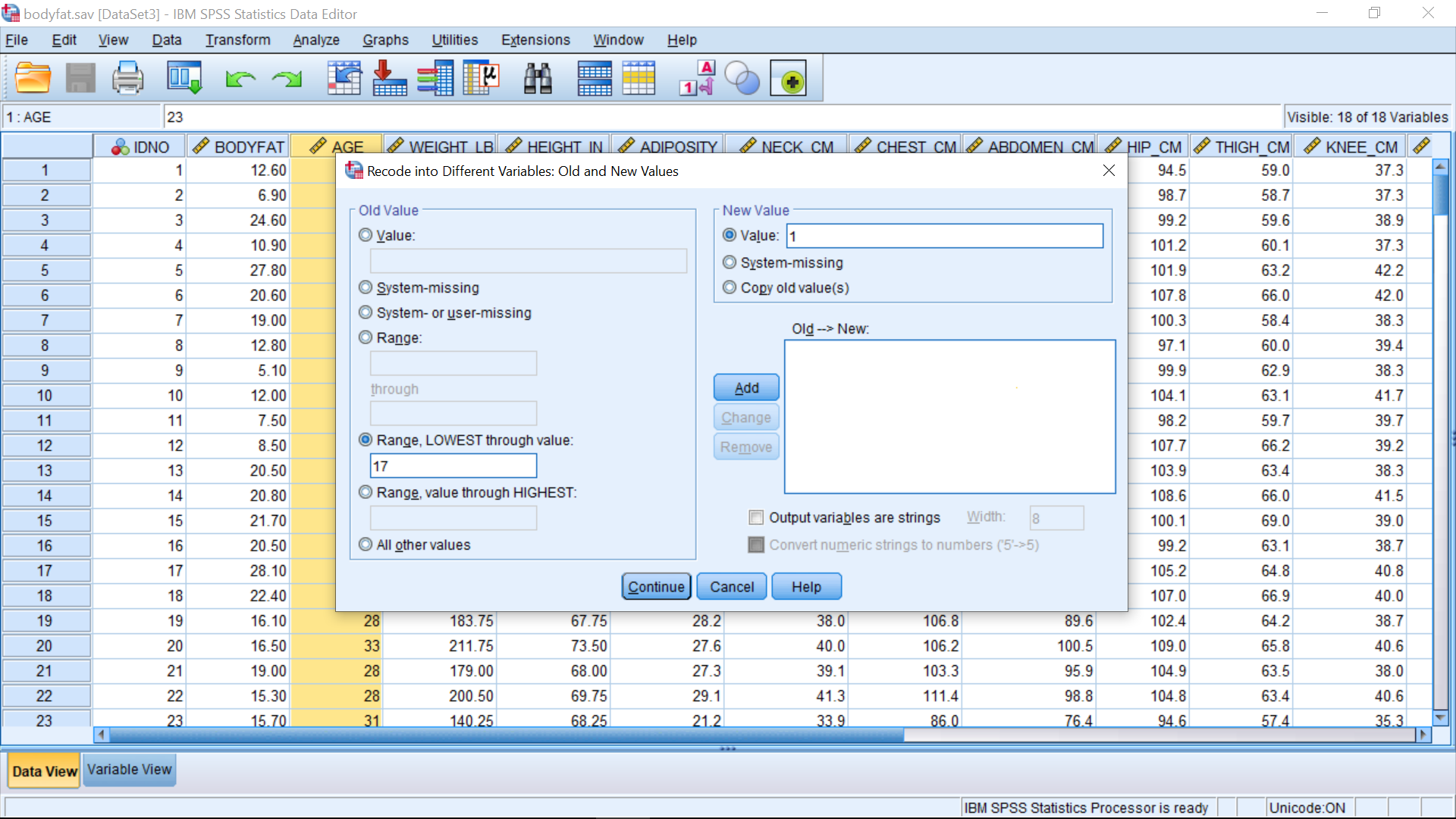
Eg. if 20 ≤age≤39 then age\_c=1

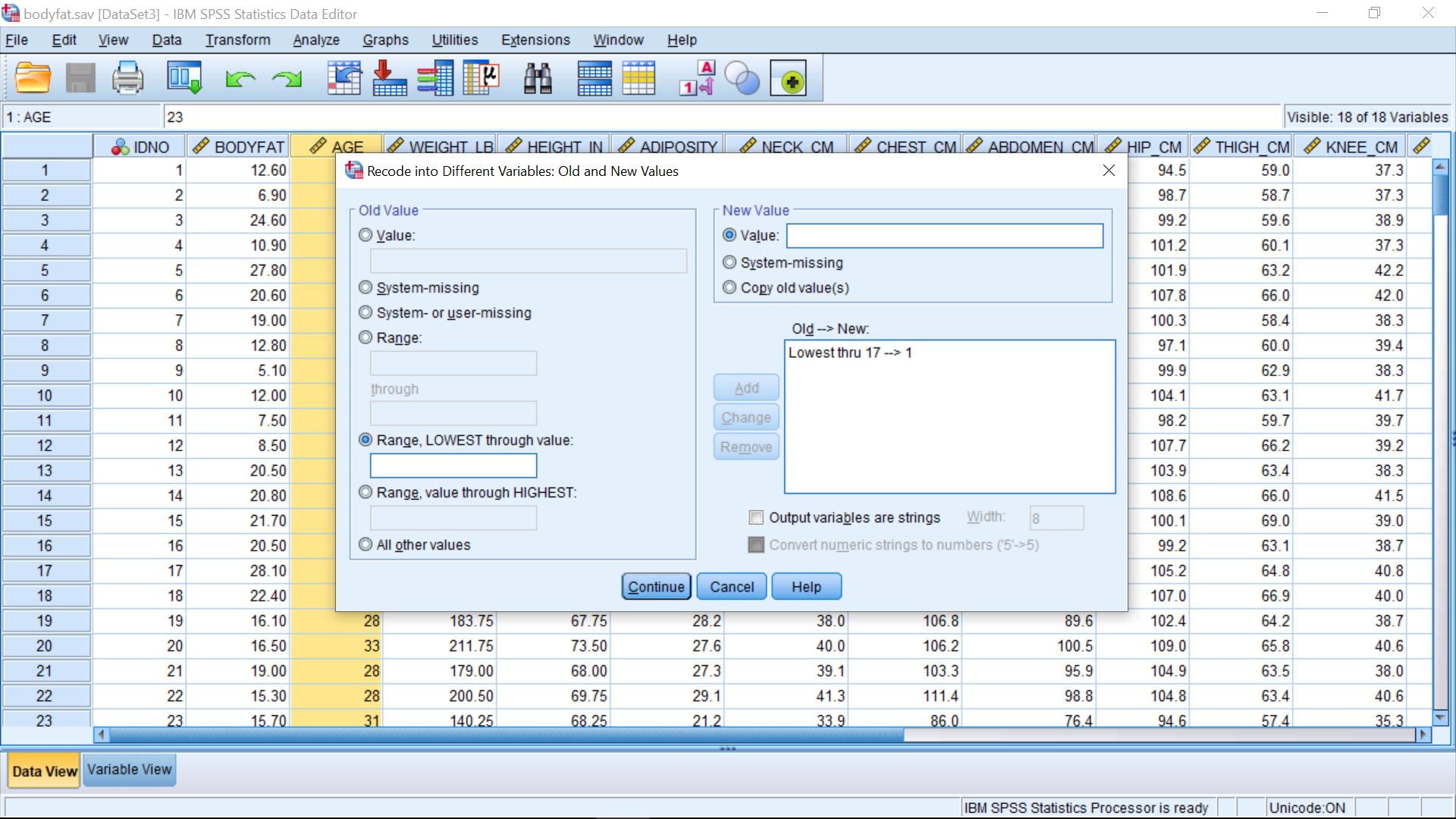






Or if age<18 then age\_c=1





1. How to generate statistics (mean, median, etc.) by group. Eg: generate statistics for bodyfat by age\_c.

