**CHAPTER 1 SOLUTIONS**

1. Constant

b) Variable; ratio

c) Variable; nominal

d) Constant

e) Variable; ratio

a) Variable; ratio

b) Constant

c) Variable; ratio

d) Variable; nominal

a) Discrete; ratio

b) Continuous; ratio

c) Discrete; ratio

d) Continuous; ratio

e) Continuous; interval. Given the care with which the SAT test has been developed, SAT scores are treated as though they are interval-leveled. What this means, of course, is that the higher the score, the greater the verbal aptitude, and that a constant difference in scores regardless of where that difference is measured along the SAT scale indicates a constant change in the underlying characteristic of aptitude. If equal discrepancies in scores do not correspond to equal verbal aptitude differences along the SAT scale then the level of measurement of the SAT would be considered ordinal. Because an absolute zero does not exist for the SAT test, this test, as well as other psychosocial tests, are not considered ratio.

1. Discrete; ratio

a) Discrete; ratio

b) Continuous; ratio

c) Continuous; ratio

d) Discrete; ratio

e) Continuous; interval (may be considered by some to be ordinal)

f) Continuous; interval

a) Discrete; nominal

b) Discrete; ratio

c) Continuous; usually treated as interval

d) Discrete; ratio

e) Continuous; interval

f) Continuous; ordinal, although in some contexts it makes sense to treat this variable as nominal. It is useful to think of this variable as ordinal when the intent is to consider those who answer yes as having more confidence in their statistics ability than those who answer no. Typically, a yes response is coded 1 and a no response is coded 0.

1. Ratio.
2. Nominal.
3. Ordinal.

a) Ratio.

1. Nominal.
2. Ordinal, although in some contexts it makes sense to treat this variable as nominal. By definition, full-time students enroll for a greater number of credits than part-time students, and in this way the two categories may be ordered naturally.
3. Ordinal.
4. Ordinal.
5. Nominal if a simple distinction is to be made between those who smoked and those who did not in 1956. Ordinal if the variable is to be conceived in terms of an individual’s degree of smoking in 1956, where degree is measured simply as a two point dichotomous scale, yes or no.
6. Ratio according to the classification hierarchy that we present. Scale according to the classification hierarchy that SPSS uses.
7. Ratio. Within the SPSS program, this variable would be designated as scale.
8. Ratio, as pressure has an absolute zero. Within the SPSS program, this variable would be designated as scale.

a) Discrete. Nominal if the intent is simply to distinguish between males and females; ordinal if the intent is to rank the categories according to degree of femaleness, for example. In the ordinal context, a higher score on this two-point dichotomous scale would imply greater femaleness.

b) Continuous. Ordinal because the categories may be ranked according to how rural they are. Higher scores would imply greater ruralness on this three-point scale.

c) Discrete; nominal.

d) Continuous; interval. As noted in the text, Likert scales are often treated as interval, although some may wish to treat them as only ordinal.

e) Discrete. Ratio because the value 0 meaningfully corresponds to “not any” institutions.

f) Continuous; interval.

g) Continuous; interval. SES can be considered to be an ordinal-leveled variable depending upon the particular way it is measured.

h) Continuous; interval. A variable defined by a sum of items measured on a Likert scale typically is treated as interval-leveled.

i) Discrete; ratio. Because this scale has an absolute zero it is not simply interval-leveled.

j) Discrete; ordinal. If the values had been the actual number of times the student was late, the variable would have been measured at the ratio level. Because broad categories of different lengths are used to classify the scores in this example, the variable is considered to be measured at the ordinal level.

1. ID.
2. ADVMAT8. To find the variable label for this variable, click the white box in the column labeled “Label” in the row designated by ADVMAT8. The label is “Advanced Math Taken in Eighth Grade.” Hence, this variable represents whether or not a student took advanced math in eighth grade.
3. Click the white box in the column labeled “Values” in the row designated by ADVMAT8; then click the grey box labeled “…”. We can see now that “no” is coded 0, “yes” is coded 1, and missing data are coded 8.
4. The level of measurement has been entered as nominal, but the variable could have been entered as ordinal if the intent is to create a ranking in terms of whether or not a student took advanced math in eighth grade.
5. Family Size.
6. The variable gives the family size or the number of members in the person’s household. This variable is naturally numeric, so it does not require value labels to explain what the numbers represent.
7. The level of measurement is listed as scale. Although we have classified variables in this text as nominal, ordinal, interval, or ratio, as noted in earlier exercise solutions, SPSS does not distinguish between interval and ratio leveled variables and classifies them both as “scale”.
8. 48.
9. 4.
10. Yes. The first student’s score is a 1 on this variable, indicating that he did take advanced math in eighth grade.
11. We do not know. That student’s score is 8 on this variable, which indicates that his or her information is missing from the data set.
12. 500.
	1. Because of the grouping of values into six discrete categories with varied lengths, LATE12 is measured at the ordinal level. If grouping categories had not been used and instead, the actual number of times late for school had been recorded, the variable would have been measured at the ratio level since 0 times late is meaningful in terms of lateness.
	2. EXPINC30 is at the ratio level as it is measured directly in dollars. If, instead, it had been measured in terms of grouped categories, as below for example, it would have been measured at the ordinal level.

1 = $0

2 = $1 - $10,000

3 = $10,001 – $20,000

 4 = $20,001 – $30,000

 5 = $30,001 – $40,000

 6 = $40,001 – $50,000

 7 = > $50,000

a) Numeric.

b) The South region of the country is coded with the value 3.

c) Variable labels are amplifications of the variable name. While it is optional to enter variable labels, it is often a good idea to do so as a way to remember more fully what the variable name signifies. Value labels are used with categorical variables to indicate which values the researcher has chosen to code each of the categories of the variable. While it is also optional to enter value labels, one should always do so as a way to remember the coding used for each categorical variable. As you will learn, the coding of a variable is critical for interpreting results.

d) Because the variable name REGION is itself sufficiently descriptive and needs no further amplification.

e) Arizona is in the West.