

Multiple Choice Questions

Descriptive Statistics - Scale of measurement

1. In an experiment to determine if antibiotics increase the final dressed weight of cattle, the following were measured on each animal in the study.

`sex, initial weight, weight gain, grade of meat.`

where grade is recorded as (A, B, or C). The scale of measurement of these variable are:

- (a) Nominal, ratio, interval, nominal
- (b) Nominal, ratio, ratio, nominal
- (c) Nominal, ratio, ratio, ordinal
- (d) Ordinal, ratio, ratio, ordinal
- (e) Ordinal, ratio, ratio, nominal

Solution: c

Past performance 1990 Oct - 83%

Past performance 2006 Dec - 94%

2. In an aquaculture study, the following variables were measured on each fish:

`sex, initial weight(g), body temperature (°C), weight gain(g).`

The scale of these four variables (in order) are:

- (a) Nominal, ratio, ratio, ratio
- (b) Nominal, ratio, interval, interval
- (c) Ordinal, ratio, interval, ratio
- (d) Nominal, ratio, interval, ratio
- (e) Ordinal, interval, ratio, interval

Solution: d

Past performance 1989 Oct - 80%
Past performance 1990 Dec - 82%
Past performance 1996 Dec - 82% (10%-b)

3. A study was conducted to investigate the effect of a coal-fire generating plant upon the water quality of a river. As part of an environmental impact study, fish were captured, tagged, and released. The following information was recorded for each fish:

```
sex(0=female, 1=male),  
length(cm),  
maturation (0=young, 1=adult),  
weight(g).
```

The scale of these variables is:

- (a) nominal, ratio, nominal, ratio
- (b) nominal, interval, ordinal, ratio
- (c) nominal, ratio, ordinal, ratio
- (d) ordinal, ratio, nominal, ratio
- (e) ordinal, interval, ordinal, ratio

Solution: c - note that maturation is ordinal as it can be ordered

Past performance 1989 Dec - 45% (44% a)
Past performance 1991 Oct - 47% (50% a)
Past performance 1996 Oct - 75% (50%-a)
Past performance 1997 Aug - 63% (32%-a)
Past performance 2006 Oct - 74% (21%-a)

4. As part of a study to investigate the effects of stubble burning, the following variables were measured at several sites around Winnipeg:

```
pH of soil (to one decimal place, e.g., 6.3);  
crop grown (0=wheat, 1=barley, 2=oats, 3=other);  
amount of stubble (0=light, 1=medium, 2=heavy);  
date of final harvesting (eg., 10 Oct 92).
```

The scales of these variables are:

- (a) interval, ordinal, ratio, ratio
- (b) interval, nominal, nominal, interval
- (c) interval, nominal, ordinal, interval

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- (d) ratio, ordinal, ordinal, ratio
 - (e) interval, nominal, ordinal, ratio

Solution: c

Past performance - 1992 Oct - 53% (20% b; 13% c; 14% e)

Past performance 1997 Jun - 86% (6% b)

5. A study was conducted to measure the effect of smoking upon the birth weight of a baby. The following variables were measured for each women in the study:

```
smoking status (yes,no),
baby birth weight (g),
APGAR score,
birth date.
```

The scales of these variables are:

- (a) nominal, ratio, ratio, ratio
- (b) ordinal, ratio, interval, interval
- (c) nominal, ratio, ordinal, ratio
- (d) nominal, ratio, ordinal, interval
- (e) ordinal, ratio, ordinal, ordinal

Solution: d

6. An experiment was performed upon rats to investigate the effect of ingesting Alar (a chemical sprayed on apple trees to keep fruit from dropping before ripe) upon subsequent cancer rates. The following variables were measured:

```
gender (0=female, 1=male);
weight (g);
dose of Alar (nil, low, high);
number of tumors
```

The typical weight of a rat is about 800 g and the weights were rounded to the nearest gram. The number of tumors is around 10. Which of the following is **FALSE**?

- (a) Gender is nominal scale; dose is ordinal scale
- (b) Gender is discrete; weight is continuous
- (c) Number of tumors is discrete and is interval scale
- (d) Dose is ordinal scale and discrete

(e) Weight is ratio scale; and number of tumors is discrete.

Solution: c

Past performance 1998 Oct - 67% (17% b)

7. A random sample of 500 households in Vancouver was selected and several variables are recorded for each household. Which of the following is **NOT CORRECT**?

- (a) Household total income is a ratio scaled variable.
- (b) Household income (which averages about \$35,000) and was rounded to the nearest \$100 can be treated as a continuous variable even though it is “discrete”.
- (c) Socioeconomic status was coded as 1=low income, 2=middle income, 3=high income and is an interval scaled variable.
- (d) The primary language used at home is a nominal scaled variable.
- (e) The number of persons in the household is a discrete variable.

Solution: c

Past performance 1998 Dec - 85%