Assignment 1. 110550085 詹天誠

1. a. The accounting alumni of a large southwestern university.

   b. Age: Quantitative data
      Gender: Qualitative data
      Level of education: Qualitative data
      Income: Quantitative data
      Job satisfaction score: Quantitative data.
      Machiavellian score: Quantitative data.

   c. The sample consists of 198 accounting alumni from the large southwestern university, these individual were selected from a random sample of 700 alumni who received the questionnaire.

   d. The researcher inferred that based on the 198 questionnaires, Machiavellian behavior is not necessarily a trait for achieving success in the accounting profession among the study population.
      This implies that there is no significant association between Machiavellian traits and professional success in accounting at least with this group of individuals.

2. a. $(40+41)/2 = \underline{40.5}$
   b. $(36+37)/2 = \underline{36.5}$
   c. first quartile $= (33+33)/2 = 33$
      $IQR = 40.5 - 33 = \underline{7.5}$.
   d. $\underline{33}$
   e. Outliers: 1. Larger than $40.5 + 7.5 \times 1.5 = 51.75$ or
      2. Less than $33 - 7.5 \times 1.5 = 21.75$
      $\Rightarrow$ Only $54 > 51.75$, there is only $\underline{1 \text{ outlier.}}$

3. The left chart is histogram, it shows the distribution of a continuous dataset.
   The right chart is bar chart, it show the comparation between distinct categories, while ages are indeed continuous, the creator of the chart wants to show the comparation between distinct age groups, so it is a bar chart.

4. a. $47 \div 30 = 1.5\bar{6}$, take the interpolation between 1.56 and 1.57 in the normal distribution table, it's $\frac{1}{3} \times 0.940620 + \frac{2}{3} \times 0.941792 \fallingdotseq 0.941401$

For normally distributed data, the probability of the number of sags less than 400 per week is about 94.14%.

b. $-84 \div 25 = -3.36$. take -3.36 in the normal distribution table, it's 0.000390

For normally distributed data, the probability of the number of swells greater than 100 per week is about $1 - 0.000390 = 0.999610 \fallingdotseq 99.96\%$.

5. The probability of falling below the lower tolerance limit: 0.022750

The probability of falling above the upper tolerance limit: 0.006210

The probability of falling within the tolerance limits: $1 - 0.022750 - 0.006210 = 0.971040$

The expected profit $= 10 \times 0.971040 - 2 \times 0.022750 - 1 \times 0.006210$

$= 9.65869 \fallingdotseq 9.66$ (\$).