1. If a hypothesis test is significant, then the conclusion is
   A. Reject $H_0$  B. Accept $H_0$  C. Reject $H_0$  D. Can’t not be sure

1. Let $X$ be a normal distributed variable with mean 30 and standard deviation 4, then $P(X>30)$ is
   A. 0.2500  B. 0.5000  C. 0.9322  D. 0.3678

1. Suppose the average salary for a employee in leisure industry is $30000 with variance $4000000, then how many of
   the employee would have a salary between $26000 and $34000?
   A. at least 89%  B. at least 75%  C. at least 99%  D. at least 95%

1. There are 5 men and 3 women in a group, and three persons will be chosen to form a committee. Let $Y$ be the number
   of women in this committee, what is the probability distribution of $Y$?
   A. Hypergeometric  B. Binomial  C. Poisson  D. Bernoulli

1. Suppose a random sample of size 36 is drawn from the population, and the mean and standard deviation of this
   sample are 30 and 6, respectively. From this information, the 90% confidence interval to estimate the population
   mean is

1. Let the $P$-value of a hypothesis test be 0.03, which of the following statements is correct?
   A. Reject $H_0$  B. Accept $H_0$  C. $\alpha = 0.02$  D. can’t be sure to reject or accept $H_0$

1. In order to estimate the average expense of a traveler, data are collected for a sample of 81 travelers over a week
   period. If the population variance is 250000, what is the sampling error, with a 95% confidence level, will be
   approximately?
   A. 108.89  B. 544.44  C. 1.39  D. 494.44

1. Let $A$ and $B$ be two events with $P(A)=0.2$ and $P(B)=0.6$. Furthermore, you are told that $P(AB)=0.12$, which of the
   following statements is correct?
   A. $A$ and $B$ are mutually exclusive  B. $P(A \cup B)=0.8$  C. $A$ and $B$ are independent  D. None of the above

1. Which of the following statements about correlation coefficient is incorrect?
   A. its value is between $-1$ and $1$  B. its sign decides the level of correlation  C. it is used to understand the
      linear relationship between two variables  D. None of the above

1. If a hypothesis test fails to reject $H_0$, which of the following statements is correct?
   A. Type I error may have been committed  B. Type I error may have been committed  C. No error
      committed  D. None of the above
一、 Mr. Huang is investigating the preference of theme park. Data are collected from 250 visitors and summarized in the following table.

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>0.17</td>
<td>0.17</td>
<td>0.15</td>
<td>0.49</td>
</tr>
<tr>
<td>Male</td>
<td>0.30</td>
<td>0.09</td>
<td>0.12</td>
<td>0.51</td>
</tr>
<tr>
<td>Total</td>
<td>0.47</td>
<td>0.26</td>
<td>0.27</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Please answer the following question according the above table:

1. What variables are Mr. Huang used in this investigation? (5%)
2. If one of the visitor is randomly selected and found him (or her) is male, what is the probability that this visitor prefer ‘A’? (5%)
3. Are ‘C’ and ‘Female’ independent and why or why not? (10%) \( \chi^2(2, 0.05)=5.991, \chi^2(3, 0.05)=7.815, \)

二、 Let X be a normally distributed variable with mean 0.7 and variance 9, Y be a normally distributed variable with mean 1.4 and variance 16. Furthermore, suppose that \( P(X \leq x, Y \leq y)=p(X \leq x)P(Y \leq y) \), please answer the following questions.

1. \( P(-7.9 < X+Y > 12.1) \)? (12%)
2. \( P(-5.7 < X-Y > 4.3) \)? (13%)

Note: 
\[
Z(0.1)=0.0398, Z(0.2)=0.0793, Z(0.3)=0.1179, Z(0.4)=0.1554 \\
Z(1.0)=0.3413, Z(1.1)=0.3438, Z(1.2)=0.3461, Z(1.3)=0.3485 \\
Z(1.5)=0.4332, Z(1.6)=0.4452, Z(1.7)=0.4554, Z(1.8)=0.4641 \\
Z(2.0)=0.4772, Z(2.1)=0.4778, Z(2.2)=0.4783, Z(2.3)=0.4788 \\
Z(2.5)=0.4938, Z(2.6)=0.4593, Z(2.7)=0.4965, Z(2.8)=0.4974
\]
三． Suppose the ‘Leisure Goods Price Index’ of three regions (Taipei, Taichung and Kaohsiung) are given in the following table:

<table>
<thead>
<tr>
<th>Year</th>
<th>Taipei</th>
<th>Taichung</th>
<th>Kaohsiung</th>
</tr>
</thead>
<tbody>
<tr>
<td>87</td>
<td>105.2</td>
<td>106</td>
<td>105.7</td>
</tr>
<tr>
<td>88</td>
<td>108.4</td>
<td>110.7</td>
<td>111</td>
</tr>
<tr>
<td>89</td>
<td>113.9</td>
<td>116.9</td>
<td>117.2</td>
</tr>
</tbody>
</table>

Please answer the following questions:

1. Is there a significant difference for ‘Leisure Goods Price Index’ among regions? why or why not? (12%)
2. Is there a significant difference for ‘Leisure Goods Price Index’ among years? why or why not? (13%)

Note: $F(3, 4), 0.05 = 6.59$, $F(2, 4), 0.05 = 6.94$, $F(3, 11), 0.05 = 3.59$, $F(2, 11), 0.05 = 3.98$