MA541_part 6

August 7, 2021

[40]:
```
#part 6
import numpy as np
import pandas as pd
import scipy.stats as st
import scipy.stats
from scipy import stats
from scipy.stats import chi2_contingency
#from scipy.stats import norm
```

[35]:
```
project_data = pd.read_csv('data.csv')
project_data.head()
```

[35]:

	Close_ETF	oil	gold	JPM
0	97.349998	0.039242	0.004668	0.032258
1	97.750000	0.001953	-0.001366	-0.002948
2	99.160004	-0.031514	-0.007937	0.025724
3	99.650002	0.034552	0.014621	0.011819
4	99.260002	0.013619	-0.011419	0.000855

[14]:
```
#Use the same sample you picked up in Step1)of Part 5 to test  : = vs. :
 ↪at the significance level 0.05.
#What's your conclusion?

x = project_data["Close_ETF"]
sample_100 = pd.Series(x.sample(n=100, replace=True))
st.norm.interval(alpha=0.95, loc=sample_100.mean(), scale=sample_100.std())

print(sample_100.mean())
print()

mu = sample_100.mean()
std = sample_100.std()
n = 100
mu_0 = 100
S_x = std/np.sqrt(n)
print(S_x)
```

```
T = (mu - mu_0)/S_x
print("The values is",T)

pval = stats.t.sf(np.abs(T), n-1)*2
print("The p value is:",pval)

alpha_1 = 0.05

if pval>alpha_1:
    print("The test is failed to reject H0")
else:
    print("The test is reject H0")
```

```
122.70040003999996

1.289192897836508
The values is 17.608226106500602
The p value is: 2.903124981046784e-32
The test is reject H0
```

[26]:
```
#Use the same sample you picked up in Step 2)of Part5 to test : = vs.  :
 ↪at the significance level 0.05.
#What's your conclusion?

x = project_data["Close_ETF"]
sample_50 = pd.Series(x.sample(n=50, replace=True))
st.t.interval(alpha=0.95, df = len(sample_50)-1, loc=sample_50.mean(),
 ↪scale=sample_50.std())
print(sample_50.mean())
print()

mu = sample_50.mean()
std = sample_50.std()
n = 50
mu_0 = 50
S_x = std/np.sqrt(n)
print(S_x)

T = (mu - mu_0)/S_x
print("The values is",T)

pval = stats.t.sf(np.abs(T), n-1)*2
print("The p value is:",pval)

alpha_1 = 0.05

if pval>alpha_1:
```

```
    print("The test is failed to reject H0")
else:
    print("The test is reject H0")
```

```
120.90079960000003

1.8099513317363165
The values is 39.172765784803566
The p value is: 1.2031069832284141e-38
The test is reject H0
```

[38]:
```
#Use the same sample you picked up in Step 2) of Part5 to test  : =  vs. :
↪  at the significance level 0.05.
#What's your conclusion?

x = project_data["Close_ETF"]
significance_level = 0.05
sigma = 15
n = 20
s = sample_50.std()
T = (n - 1)/(s/sigma) ** 2
print("The values is",T)

chi_test_result = scipy.stats.chi2.ppf(1-.05, df=2)
print("The result is:",chi_test_result)

if T>significance_level:
    print("The test is failed to reject H0")
else:
    print("The test is reject H0")
```

```
The values is 28.50009862620642
The result is: 5.991464547107979
The test is failed to reject H0
```

[41]:
```
#Use the same sample you picked up in Step2) of Part 5 to test  : =  vs. :
↪  at the significance level 0.05.
#What's your conclusion?

x = project_data["Close_ETF"]
significance_level = 0.05
sigma = 15
n = 20
s = sample_50.std()
T = (n - 1)/(s/sigma) ** 2
print("The values is",T)
```

```
if T < scipy.stats.chi2.ppf(1 - significance_level, n - 1) :
    print("The test is failed to reject H0")
else:
    print("The test is reject H0")
```

```
The values is 28.50009862620642
The test is failed to reject H0
```

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