# ‏Goodness to Fit

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# The Main Class

import math  
import pandas as pd  
import scipy.stats  
alpha=float(input('Enter the significance level to use :'))  
data=pd.DataFrame({'period':[0,1,2,3,4,5,6,7,8,9,10,11],'frequency':[12,10,19,17,10,8,7,5,5,3,3,1]})  
n=sum(data['frequency'])  
print(data)  
mean=sum(data['period']\*data['frequency'])/100  
Var=((sum((data['period']\*\*2)\*data['frequency']))-100\*mean\*\*2)/(n-1)  
Ex=[0]\*len(data)  
chi=[0]\*len(data)  
for i in range(len(data)):  
 Ex[i]=n\*((math.exp(-mean)\*mean\*\*data['period'][i])/math.factorial(data['period'][i]))  
data.insert(2,'E(x)',Ex)  
for i in range(len(data)):  
 chi[i]=((data['frequency'][i]-Ex[i])\*\*2/Ex[i])  
data.insert(3,'chi test',chi)  
chi\_result=sum(data['chi test'])  
df=len(data)-2  
chi\_alpha=scipy.stats.chi2.ppf(1-alpha,df)  
print(data)  
print('The calculated chi-square value =',chi\_result)  
if chi\_result >chi\_alpha:  
 print("The hypothesis is rejected")  
else :  
 print('The hypothesis is not rejected')

# The Output

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Done ..