import networkx as nx

import matplotlib.pyplot as plt

import random as r

def homo(g,n):

ls=list(g.nodes())

for i in range(len(ls)):

g.add\_edge(ls[i],ls[i-1])

g.add\_edge(ls[i],ls[i-2])

c,d=i+1,i+2

if c==n:

c=0

if d==n:

d=0

if d==n+1:

d=1

g.add\_edge(ls[i],ls[c])

g.add\_edge(ls[i],ls[d])

def long\_tie(g):

v1=0

v2=0

ls=list(g.nodes())

while(v1==v2):

v1=r.choice(ls)

v2=r.choice(ls)

g.add\_edge(v1,v2)

def main():

g=nx.Graph()

n=input('Enter the no. of nodes:')

for each in range(n):

g.add\_node(each)

homo(g,n)

x=[]

t=0

y=[]

while(t<=100):

long\_tie(g)

x.append(t)

t+=1

y.append(nx.diameter(g))

plt.plot(x,y)

plt.xlabel('No. of weak ties')

plt.ylabel('Diameter of the network')

plt.title('The change in diameter of the network')

plt.show()

main()