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"""
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Cap 6

"""

import sys
import networkx as nx
import numpy as np
sys.path.insert(0, ' D/PYTHON/Programmi/code')
from networkx.algorithms import approximation as app
from thinkstats2 import Cdf
import thinkplot
import matplotlib.pyplot as plt

nome='D:/PYTHON/facebook_combined.txt.gz' # carica FB e lo assegna a nome

def degrees(G): # calcola i gradi del grafo
    return[G.degree(u) for u in G]
def read_graph(filename): # funzione di lettura e grafo del file
    G=nx.Graph()
    array=np.loadtxt(filename, dtype=int)
    G.add_edges_from(array)
    return G

fb = read_graph(nome) # assegna a fb il grafo
cdf_fb=Cdf(degrees(fb)) # calcola CDF per FB

ws=nx.watts_strogatz_graph(4039,44,0.05)
cdf_ws=Cdf(degrees(ws)) # calcola CDF per WS

ba=nx.barabasi_albert_graph(4039, 22)
cdf_ba=Cdf(degrees(ba)) # calcola CDF per BA

print()

print('-----')

print()
print('I grafici sono i seguenti')
print()
print('-----')

print()

fig, ax = plt.subplots(facecolor='teal', alpha=0.1)
plt.style.use('ggplot') #sottofondo grigio e griglia bianca
plt.tick_params(labelcolor='y')

ax.set_xlabel('log gradi', color='y')
ax.set_ylabel('log FDC', color='y')

thinkplot.Cdf(cdf_fb,color='red', label='FACEBOOK')

thinkplot.Cdf(cdf_ws, color='green', label='Modello WS')

thinkplot.Show(xscale='log')
print()

fig, ax = plt.subplots(facecolor='teal', alpha=0.1)

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plt.style.use('ggplot')      #sottofondo grigio e griglia bianca
plt.tick_params(labelcolor='y')
ax.set_xlabel('log gradi', color='y')
ax.set_ylabel('log FDC', color='y')

thinkplot.Cdf(cdf_fb,color='red', label='FACEBOOK')
thinkplot.Cdf(cdf_ba,color='blue', label='Modello Barabasi-Albert')
thinkplot.Show(xscale='log')
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