Tópicos Especiais em Ciência da Computação II

Atividade - Comparativo entre modelos (COVID-19)

```
from sklearn.metrics import mean_squared_error, mean_absolute_error,
mean_absolute_percentage_error

def mse(p, psim):
  return (p - psim) ** 2

pi = dados["Total de Casos"].copy()


#MSE

mse_malthus = mean_squared_error(pi, regressaoCasos_malthus)
mse_verhulst = mean_squared_error(pi, valor_verhulst)
mse_gompertz = mean_squared_error(pi, valor_gompertz)

print(f"MSE Malthus: {mse_malthus}")
print(f"MSE Verhulst: {mse_verhulst}")
print(f"MSE Gompertz: {mse_gompertz}")
print()

#RMSE
print(f"RMSE Malthus: {mse_malthus**0.5}")
print(f"RMSE Verhulst: {mse_verhulst**0.5}")
print(f"RMSE Gompertz: {mse_gompertz**0.5}")
print()

#MAE
mae_malthus = mean_absolute_error(pi, regressaoCasos_malthus)
mae_verhulst = mean_absolute_error(pi, valor_verhulst)
mae_gompertz = mean_absolute_error(pi, valor_gompertz)

print(f"MAE Malthus: {mae_malthus}")
print(f"MAE Verhulst: {mae_verhulst}")
print(f"MAE Gompertz: {mae_gompertz}")
print()

#MAPE
mape_malthus = mean_absolute_percentage_error(pi,
regressaoCasos_malthus)
```

```
mape_verhulst = mean_absolute_percentage_error(pi, valor_verhulst)
mape_gompertz = mean_absolute_percentage_error(pi, valor_gompertz)

print(f"MAPE Malthus: {mape_malthus}")
print(f"MAPE Verhulst: {mape_verhulst}")
print(f"MAPE Gompertz: {mape_gompertz}")
print()

plt.title("Erro quadratico medio")
malthus = []
verhulst = []
gompertz = []
for p in pi:
  malthus.append(mse(p, regressaoCasos_malthus[i]))
  verhulst.append(mse(p, valor_verhulst[i]))
  gompertz.append(mse(p, valor_gompertz[i]))
plt.plot(T, malthus, c="r",label="Malthus")
plt.plot(T, verhulst, c="g",label="Verhulst")
plt.plot(T, gompertz, c="b", label="Gompertz")
plt.legend()
plt.show()
```

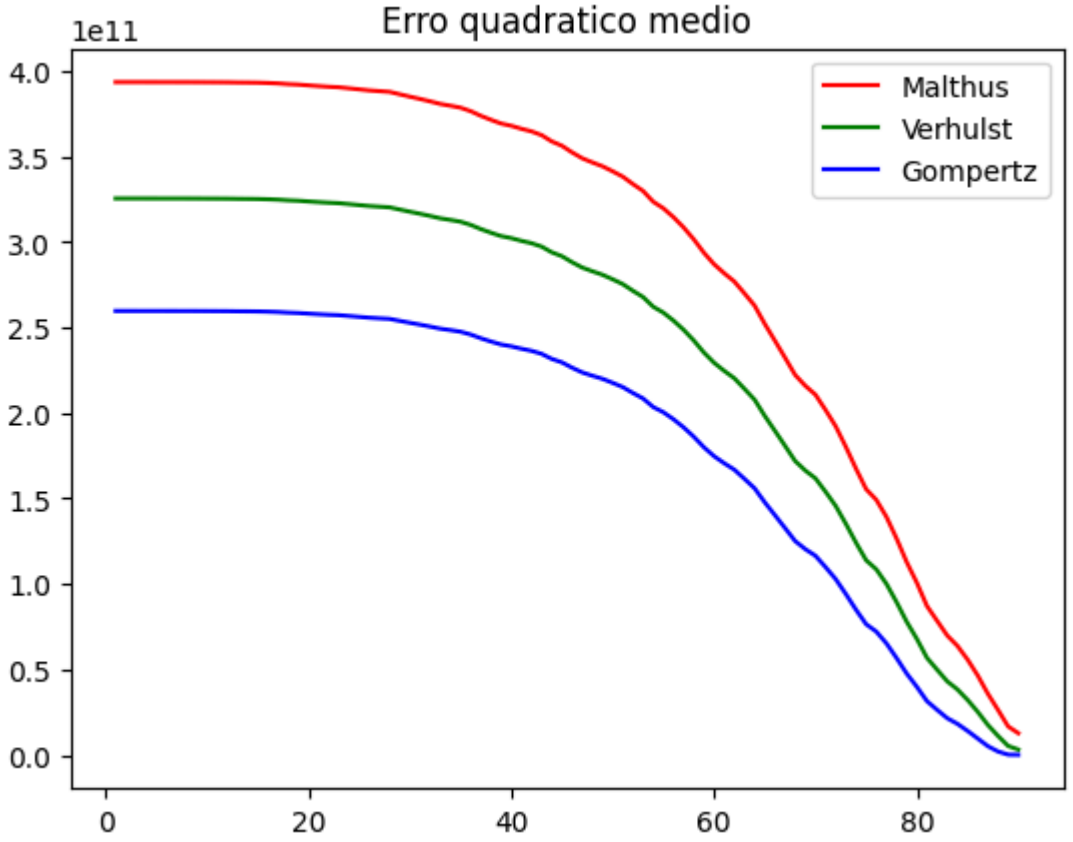
Saída

```
MSE Malthus: 497770434.96559584
MSE Verhulst: 2089504107.7089403
MSE Gompertz: 87495250.91994384

RMSE Malthus: 22310.76948394196
RMSE Verhulst: 45711.093923783315
RMSE Gompertz: 9353.889614483584

MAE Malthus: 10248.1635731822
MAE Verhulst: 27191.75312894002
MAE Gompertz: 6274.573959166751

MAPE Malthus: 21.48801534087889
MAPE Verhulst: 1.2334127604732006
MAPE Gompertz: 0.43685527250277567
```


Erro quadratico medio
1e11
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0
20
40
60
80
Malthus
Verhulst
Gompertz