Plotter

December 18, 2018

```python
In [1]: import pandas as pd
        import seaborn as sns
        import csv
        import matplotlib.pyplot as plt
```

```python
In [2]: %matplotlib inline
```

```python
In [3]: jovenes=pd.read_csv('entropyPaper/Data/Jovenescompleto.csv')
        adultos=pd.read_csv('entropyPaper/Data/Adultoscompleto.csv')

        print(len(jovenes))
        print(len(adultos))
```

```
31
8
```

```python
In [4]: adultosHigh=adultos.loc[adultos['Cuestionario']=='HIGH']
        jovenesHigh=jovenes.loc[jovenes['Cuestionario']=='HIGH']
        adultosLow=adultos.loc[adultos['Cuestionario']=='LOW']
        jovenesLow=jovenes.loc[jovenes['Cuestionario']=='LOW']
        jovenesHigh
```

```
Out[4]:      Persona  Edad  Talla  Peso        IMC Cuestionario  ReposoSamp  \
        8   Enrique1    23   1.72  73.0  24.675500         HIGH      1.3663
        9   Enrique2    23   1.72  73.0  24.675500         HIGH      1.1434
        10  Enrique3    23   1.72  73.0  24.675500         HIGH      0.9828
        11     Jardi    22   1.75  66.0  21.551020         HIGH      0.7543
        13     Jorge    21   1.80  85.0  26.234568         HIGH      0.6985
        28     Edgar    21   1.80  72.0  22.222220         HIGH      0.8635

            3.5MPHSamp  4MPHSamp  PendienteSamp  ReposoFuzz  3.5MPHFuzz  4MPHFuzz  \
        8       1.8354    1.3585        -0.0078      0.4994      0.4352    0.2629
        9       1.5081    1.3231         0.1797      0.4888      0.4017    0.3583
        10      0.7841    0.3081        -0.6747      0.4994      0.4352    0.2629
        11      1.3291    1.0608         0.3065      0.3984      0.3660    0.2752
        13      0.9581    0.7908         0.0923      0.3426      0.4406    0.3986
        28      1.1731    1.1539         0.2904      0.3251      0.2861    0.3281
```

|	PendienteFuzz	ReposoAp	3.5MPHAp	4MPHAp	PendienteAp
8	-0.2365	1.1979	0.8679	1.0321	-0.1658
9	-0.1305	1.1547	1.0426	1.094	-0.0607
10	-0.2365	0.9953	1.0549	0.5312	-0.4641
11	-0.1232	1.1723	1.3618	1.1789	0.0066
13	0.0560	0.9514	1.1103	0.9476	-0.0038
28	0.0030	0.8283	1.0440	1.0793	0.2510

```
In [5]: fig=plt.figure()
        axes=fig.add_axes([0.1,0.1,2,2])
        x=[0,1,2]
        xt=['SampEn','FuzzySE','ApEn']
        for index,row in jovenesHigh.iterrows():
            jov=[row['ReposoSamp'],row['ReposoFuzz'],row['ReposoAp']]
            axes.plot(jov, '*-', markersize=10)
        axes.legend(jovenesHigh['Persona'])
        plt.xticks(x,xt,fontsize=12)
        plt.title('Comparación Entropias Jovenes Activos en Reposo',fontsize=16)
        plt.ylabel('Magnitud',fontsize=14)
```

```
Out[5]: Text(0, 0.5, 'Magnitud')
```


Comparación Entropias Jovenes Activos en Reposo
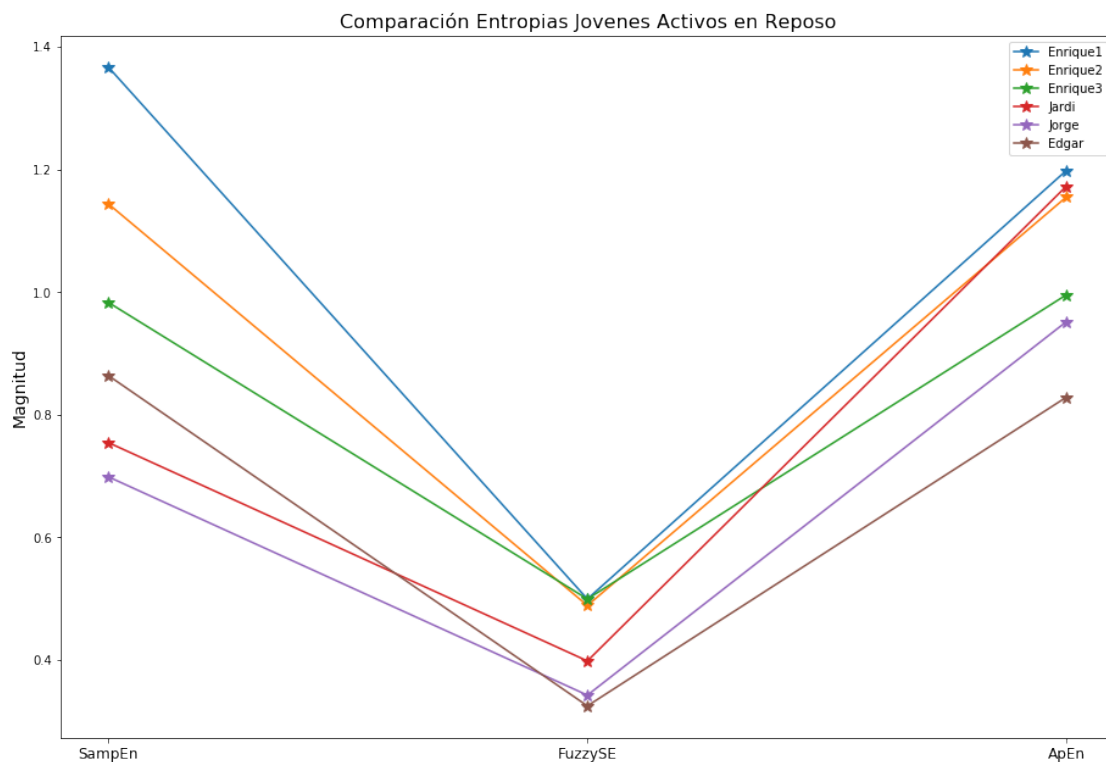
```
In [6]: fig=plt.figure()
        axes=fig.add_axes([0.1,0.1,2,2])
        x=[0,1,2]
        xt=['SampEn','FuzzySE','ApEn']
        for index,row in jovenesHigh.iterrows():
            jov=[float(row['4MPHSamp']),float(row['4MPHFuzz']),float(row['4MPHAp'])]
            axes.plot(jov, '*-', markersize=10)
        axes.legend(jovenesHigh['Persona'])
        plt.xticks(x,xt,fontsize=12)
        plt.title('Comparación Entropias Jovenes Activos a 4 MPH',fontsize=16)
        plt.ylabel('Magnitud',fontsize=14)
```
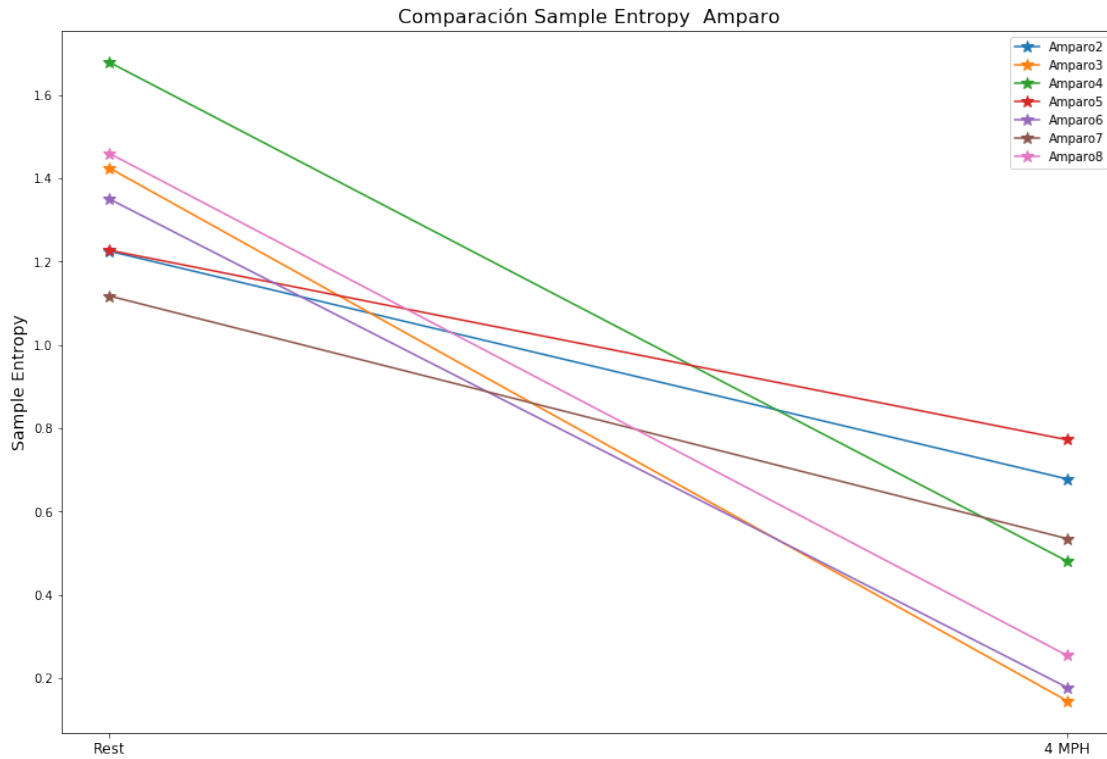
Out[6]: Text(0, 0.5, 'Magnitud')
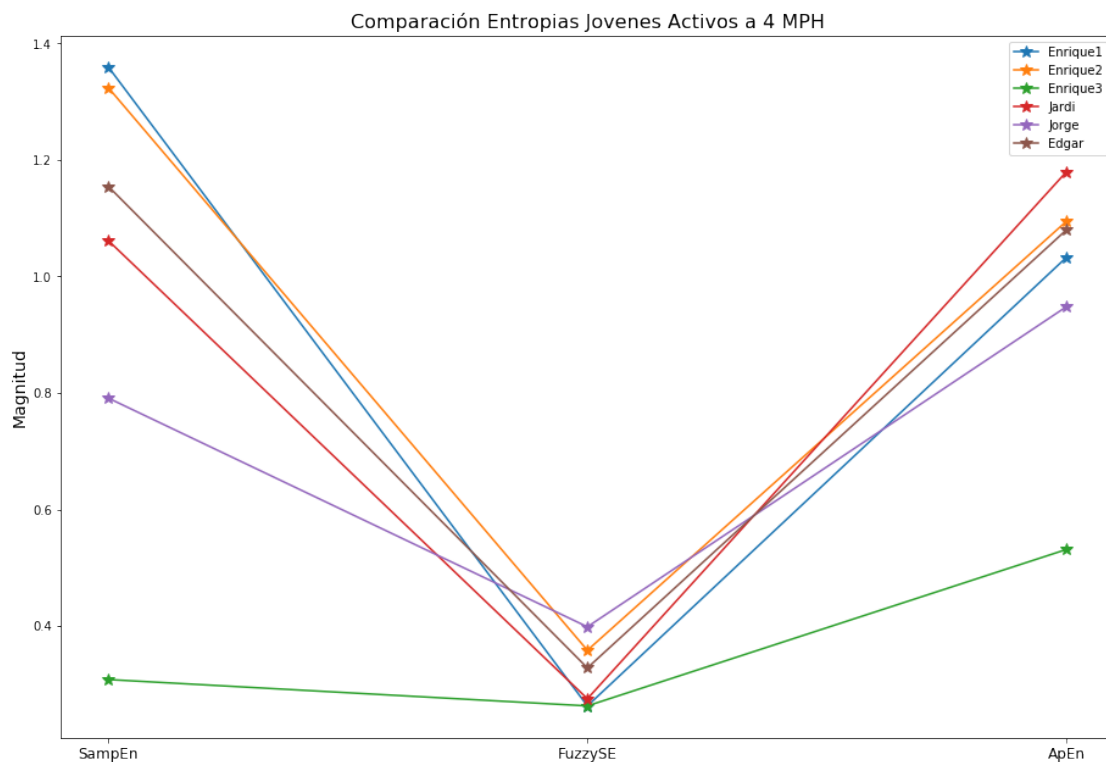

```
In [7]: Amparo=jovenes[jovenes['Persona'].str.contains("Amp")]
        fig=plt.figure()
        axes=fig.add_axes([0.1,0.1,2,2])
        x=[0,1]
        xt=['Rest','4 MPH',]
        for index,row in Amparo.iterrows():
            jov=[float(row['ReposoSamp']),float(row['4MPHSamp'])]
            axes.plot(jov, '*-', markersize=10)
        axes.legend(Amparo['Persona'])
```
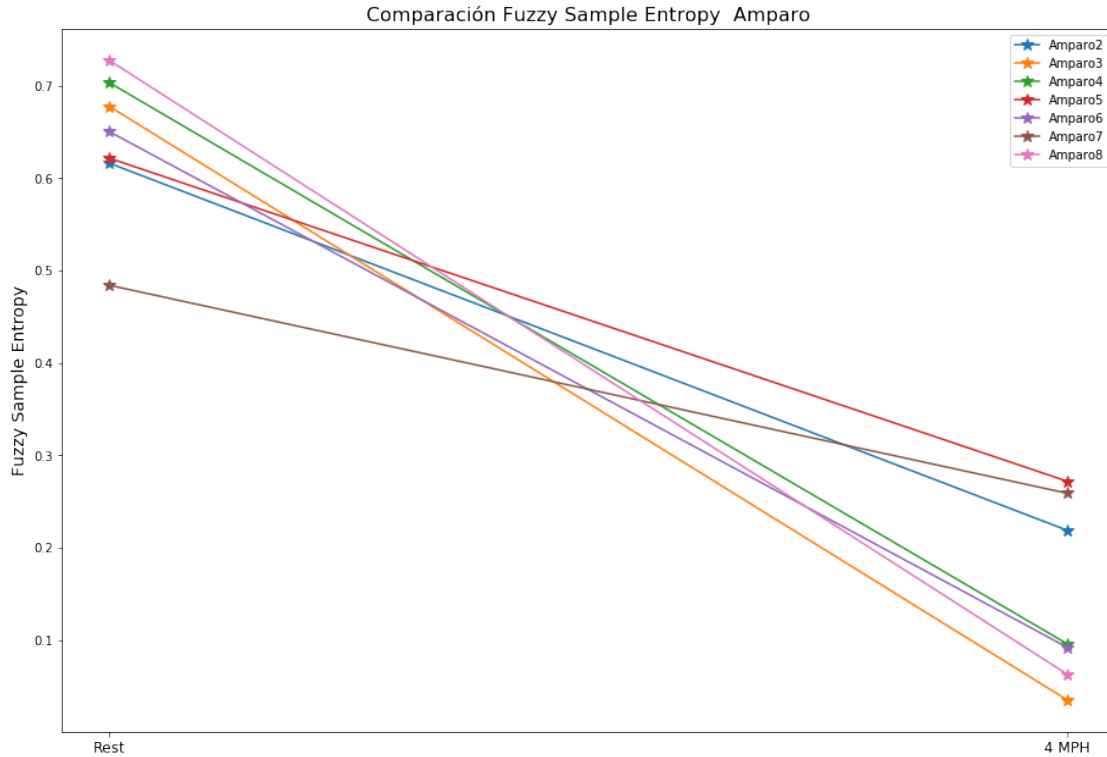
```
plt.xticks(x,xt,fontsize=12)
plt.title('Comparación Sample Entropy  Amparo',fontsize=16)
plt.ylabel('Sample Entropy',fontsize=14)
```

Out[7]: Text(0, 0.5, 'Sample Entropy')

Comparación Sample Entropy Amparo

In [8]:
```
Amparo=jovenes[jovenes['Persona'].str.contains("Amp")]
fig=plt.figure()
axes=fig.add_axes([0.1,0.1,2,2])
x=[0,1]
xt=['Rest','4 MPH',]
for index,row in Amparo.iterrows():
    jov=[float(row['ReposoFuzz']),float(row['4MPHFuzz'])]
    axes.plot(jov, '*-', markersize=10)
axes.legend(Amparo['Persona'])
plt.xticks(x,xt,fontsize=12)
plt.title('Comparación Fuzzy Sample Entropy  Amparo',fontsize=16)
plt.ylabel('Fuzzy Sample Entropy',fontsize=14)
```

Out[8]: Text(0, 0.5, 'Fuzzy Sample Entropy')

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Comparación Fuzzy Sample Entropy Amparo

```
In [9]: Amparo=jovenes[jovenes['Persona'].str.contains("Amp")]
        fig=plt.figure()
        axes=fig.add_axes([0.1,0.1,2,2])
        x=[0,1]
        xt=['Rest','4 MPH',]
        for index,row in Amparo.iterrows():
            jov=[float(row['ReposoAp']),float(row['4MPHAp'])]
            print(jov)
            axes.plot(jov, '*-', markersize=10)
        axes.legend(Amparo['Persona'])
        plt.xticks(x,xt,fontsize=12)
        plt.title('Comparación Ap Entropy  Amparo',fontsize=16)
        plt.ylabel('Ap Entropy',fontsize=14)

[1.4492, 0.8773]
[1.3084, 0.1946]
[1.3159, 0.5838]
[1.7373, 0.6022]
[1.24, 0.262]
[1.057, 0.6698]
[1.2693, 0.36]


Out[9]: Text(0, 0.5, 'Ap Entropy')
```

Comparación Ap Entropy Amparo
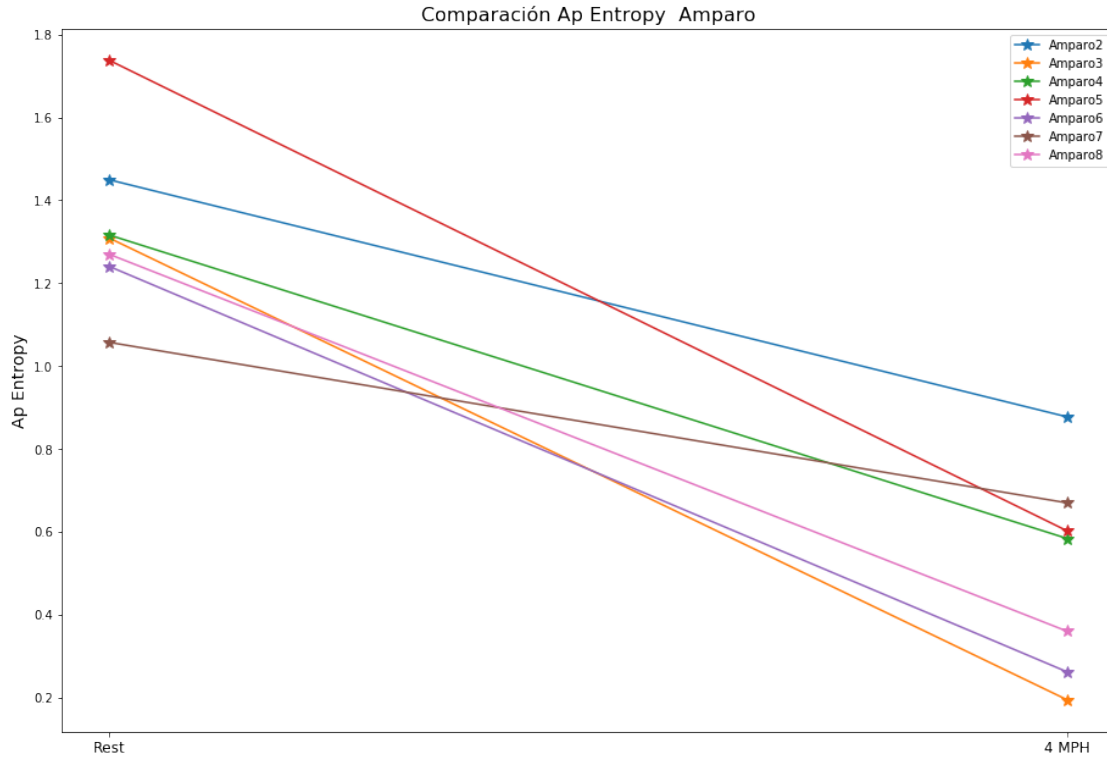
```
In [10]: fig=plt.figure()
         axes=fig.add_axes([0.1,0.1,2,2])
         x=[0,1]
         xt=['Rest','4 MPH']
         Jov=jovenes[jovenes['Cuestionario']=="HIGH"]
         for index,row in Jov.iterrows():
             if row['4MPH']=='?':
                 jov=[float(row['ReposoAp']),float(row['3.5MPHAp'])]
             else:
                 jov=[float(row['ReposoSamp']),float(row['4MPHSamp'])]
             axes.plot(jov, '*-', markersize=10)
         axes.legend(Jov['Persona'])
         plt.xticks(x,xt,fontsize=12)
         plt.title('Comparación Sample Entropy jovenes',fontsize=16)
         plt.ylabel('Sample Entropy',fontsize=14)

Out[10]: Text(0, 0.5, 'Sample Entropy')
```
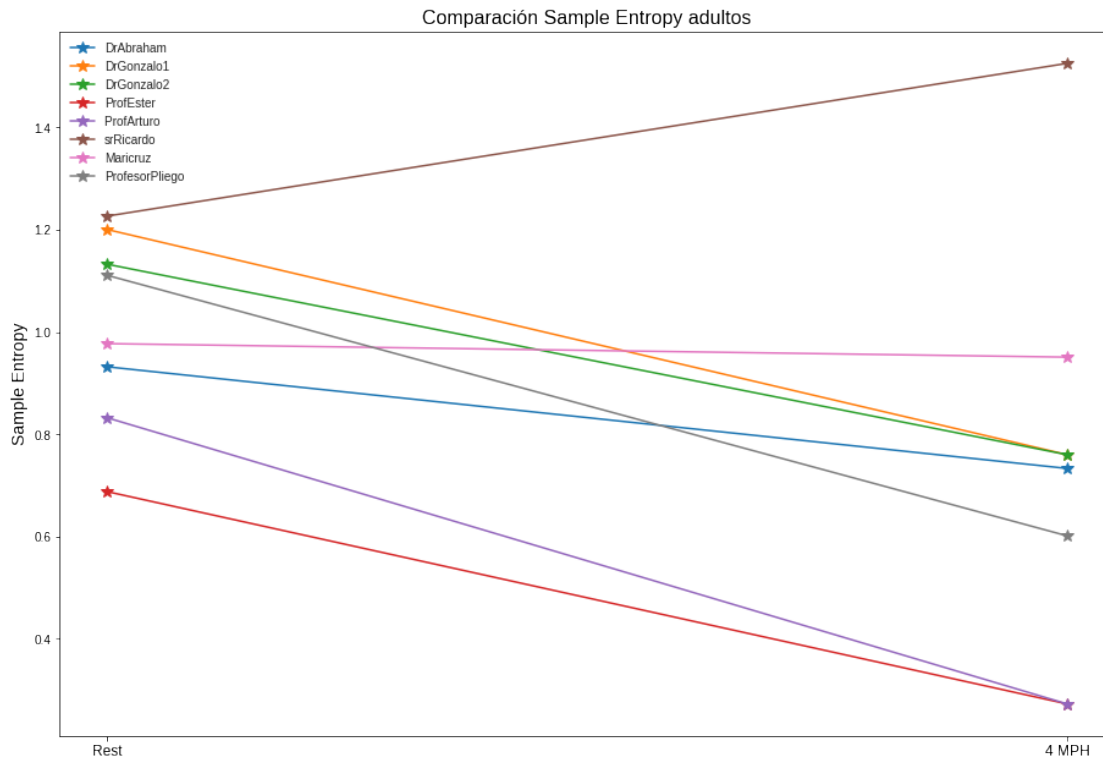
Comparación Sample Entropy jovenes
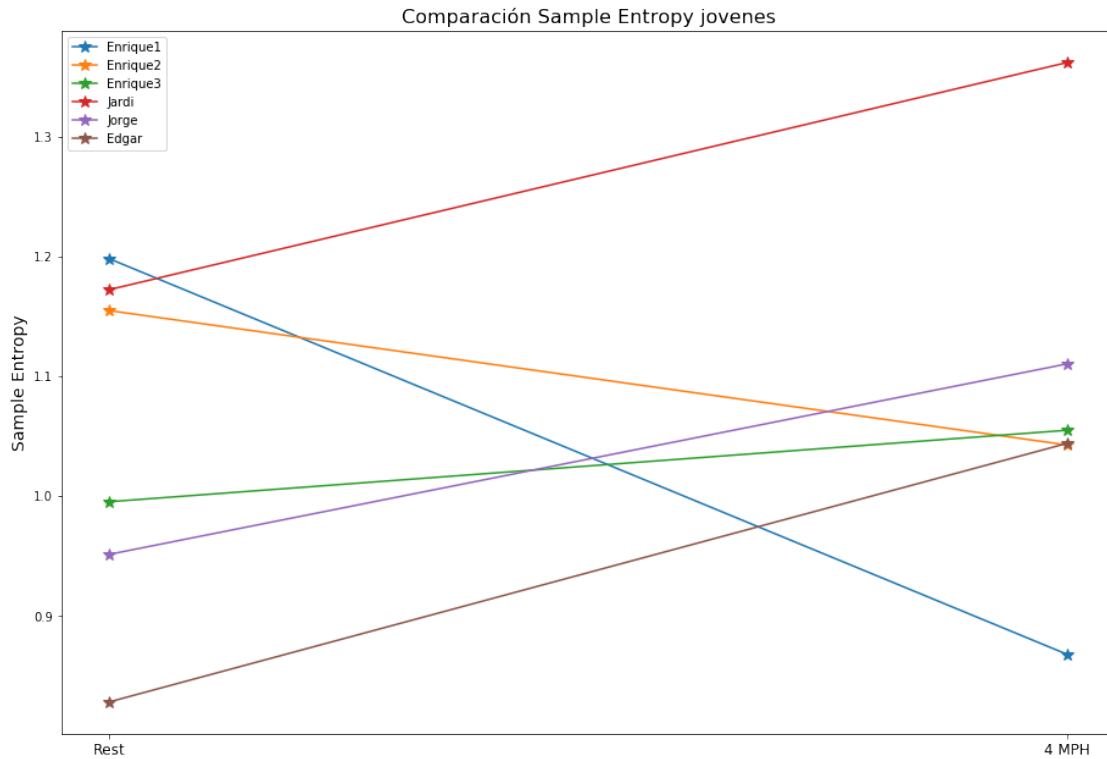
```
In [11]: fig=plt.figure()
         axes=fig.add_axes([0.1,0.1,2,2])
         x=[0,1]
         plt.style.use('seaborn-darkgrid')

         xt=['Rest','4 MPH']
         for index,row in adultos.iterrows():
             if row['4MPH']=='?':
                 jov=[float(row['ReposoAp']),float(row['3.5MPHAp'])]
             else:
                 jov=[float(row['ReposoSamp']),float(row['4MPHSamp'])]
             axes.plot(jov, '*-', markersize=10)
         axes.legend(adultos['Persona'])
         plt.xticks(x,xt,fontsize=12)
         plt.title('Comparación Sample Entropy adultos',fontsize=16)
         plt.ylabel('Sample Entropy',fontsize=14)

Out[11]: Text(0, 0.5, 'Sample Entropy')
```

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Comparación Sample Entropy adultos

Legend:
- DrAbraham
- DrGonzalo1
- DrGonzalo2
- ProfEster
- ProfArturo
- srRicardo
- Maricruz
- ProfesorPliego

Y-axis: Sample Entropy

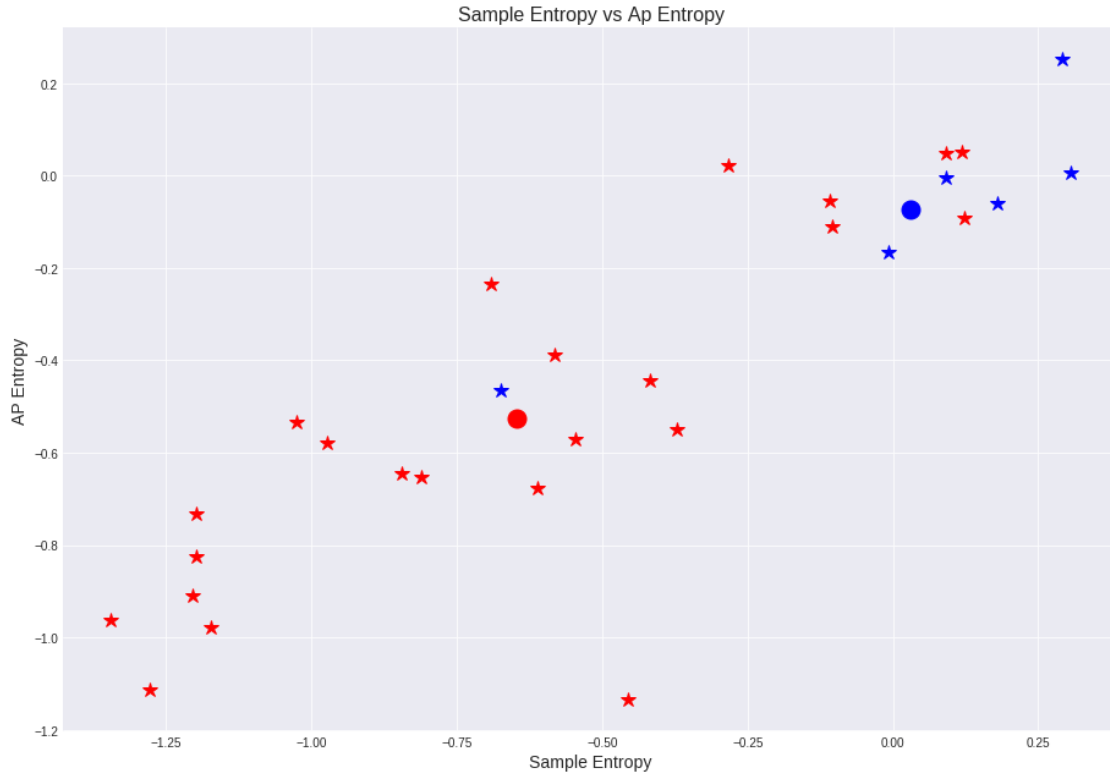X-axis: Rest, 4 MPH

```
In [ ]:

In [12]: fig=plt.figure()
         axes=fig.add_axes([0.1,0.1,2,2])

         plt.style.use('seaborn-darkgrid')
         Act=jovenes[jovenes['Cuestionario']=='HIGH']
         Sed=jovenes[jovenes['Cuestionario']=='LOW']
         axes.plot(Act['PendienteSamp'],Act['PendienteAp'],'*',markersize=12,color='blue')

         axes.plot(Sed['PendienteSamp'],Sed['PendienteAp'],'*',markersize=12,color='red')
         axes.plot(Sed['PendienteSamp'].mean(),Sed['PendienteAp'].mean(),'o',markersize=15,col
         axes.plot(Act['PendienteSamp'].mean(),Act['PendienteAp'].mean(),'o',markersize=15,col

         plt.title('Sample Entropy vs Ap Entropy',fontsize=16)
         plt.xlabel('Sample Entropy',fontsize=14)
         plt.ylabel('AP Entropy',fontsize=14)

Out[12]: Text(0, 0.5, 'AP Entropy')
```

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Sample Entropy vs Ap Entropy

```
In [13]: fig=plt.figure()
         axes=fig.add_axes([0.1,0.1,2,2])

         plt.style.use('seaborn-darkgrid')
         Act=jovenes[jovenes['Cuestionario']=='HIGH']
         Sed=jovenes[jovenes['Cuestionario']=='LOW']

         axes.plot(Sed['PendienteSamp'],Sed['PendienteFuzz'],'*',markersize=12,color='red')
         axes.plot(Act['PendienteSamp'],Act['PendienteFuzz'],'*',markersize=12,color='blue')

         axes.plot(Sed['PendienteSamp'].mean(),Sed['PendienteFuzz'].mean(),'o',markersize=15,co
         axes.plot(Act['PendienteSamp'].mean(),Act['PendienteFuzz'].mean(),'o',markersize=15,co

         plt.title('Sample Entropy vs Fuzzy Entropy',fontsize=16)
         plt.xlabel('Sample Entropy',fontsize=14)
         plt.ylabel('Fuzzy Entropy',fontsize=14)

Out[13]: Text(0, 0.5, 'Fuzzy Entropy')
```
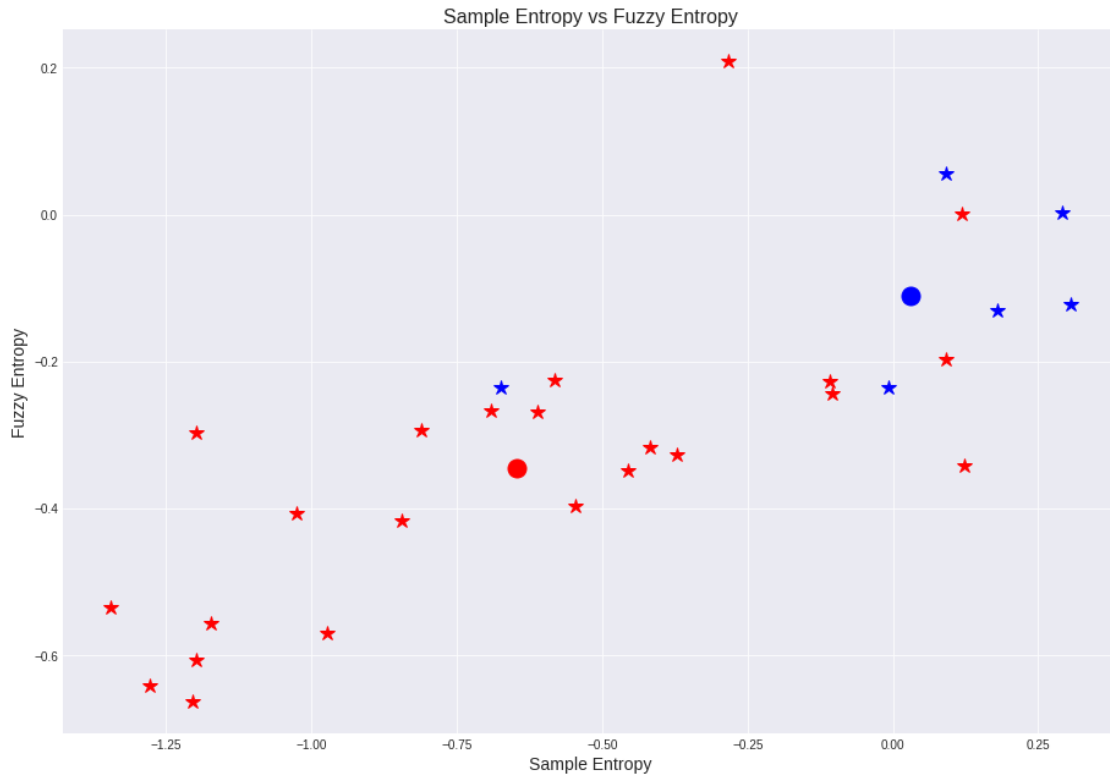
9

Sample Entropy vs Fuzzy Entropy

```
In [14]: fig=plt.figure()
         axes=fig.add_axes([0.1,0.1,2,2])

         plt.style.use('seaborn-darkgrid')
         Act=jovenes[jovenes['Cuestionario']=='HIGH']
         Sed=jovenes[jovenes['Cuestionario']=='LOW']

         axes.plot(Act['PendienteFuzz'],Act['PendienteAp'],'*',markersize=12,color='blue')
         axes.plot(Sed['PendienteFuzz'],Sed['PendienteAp'],'*',markersize=12,color='red')

         axes.plot(Act['PendienteFuzz'].mean(),Act['PendienteAp'].mean(),'o',markersize=15,col
         axes.plot(Sed['PendienteFuzz'].mean(),Sed['PendienteAp'].mean(),'o',markersize=15,col


         plt.title('Fuzzy Entropy vs Ap Entropy',fontsize=16)
         plt.xlabel('Fuzzy Entropy',fontsize=14)
         plt.ylabel('AP Entropy',fontsize=14)

Out[14]: Text(0, 0.5, 'AP Entropy')
```

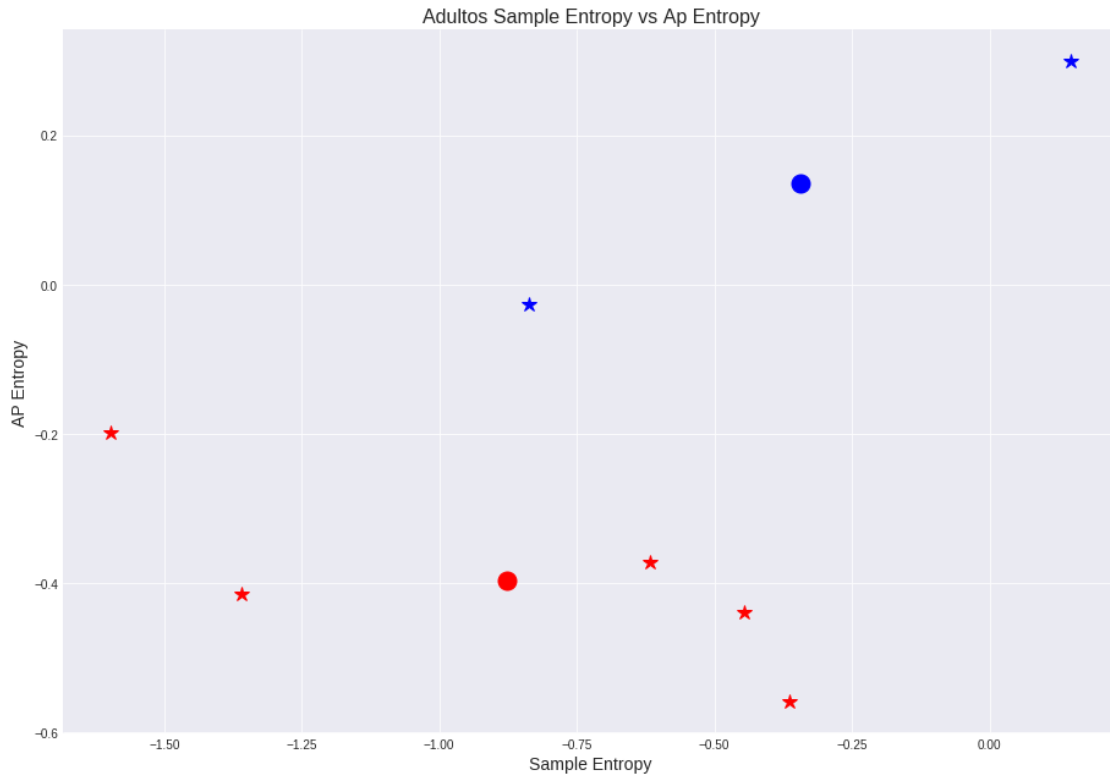Fuzzy Entropy vs Ap Entropy

```
In [15]: fig=plt.figure()
         axes=fig.add_axes([0.1,0.1,2,2])

         plt.style.use('seaborn-darkgrid')
         Act=adultos[adultos['Cuestionario']=='HIGH']
         Sed=adultos[adultos['Cuestionario']=='LOW']
         axes.plot(Act['PendienteSamp'],Act['PendienteAp'],'*',markersize=12,color='blue')

         axes.plot(Sed['PendienteSamp'],Sed['PendienteAp'],'*',markersize=12,color='red')
         axes.plot(Sed['PendienteSamp'].mean(),Sed['PendienteAp'].mean(),'o',markersize=15,col
         axes.plot(Act['PendienteSamp'].mean(),Act['PendienteAp'].mean(),'o',markersize=15,col

         plt.title('Adultos Sample Entropy vs Ap Entropy',fontsize=16)
         plt.xlabel('Sample Entropy',fontsize=14)
         plt.ylabel('AP Entropy',fontsize=14)

Out[15]: Text(0, 0.5, 'AP Entropy')
```

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Adultos Sample Entropy vs Ap Entropy

In [16]: Jlow= jovenesLow.copy()
         LowComplete= Jlow.append(adultos[adultos['Cuestionario']=='LOW'])
         # ActComplete

         Jact= jovenesHigh.copy()
         ActComplete= Jact.append(adultos[adultos['Cuestionario']=='HIGH'])
         # ActComplete

/home/eric/anaconda3/envs/TS/lib/python3.7/site-packages/pandas/core/frame.py:6211: FutureWarn:
of pandas will change to not sort by default.

To accept the future behavior, pass 'sort=False'.

To retain the current behavior and silence the warning, pass 'sort=True'.

  sort=sort)

In [17]: fig=plt.figure()
         axes=fig.add_axes([0.1,0.1,2,2])
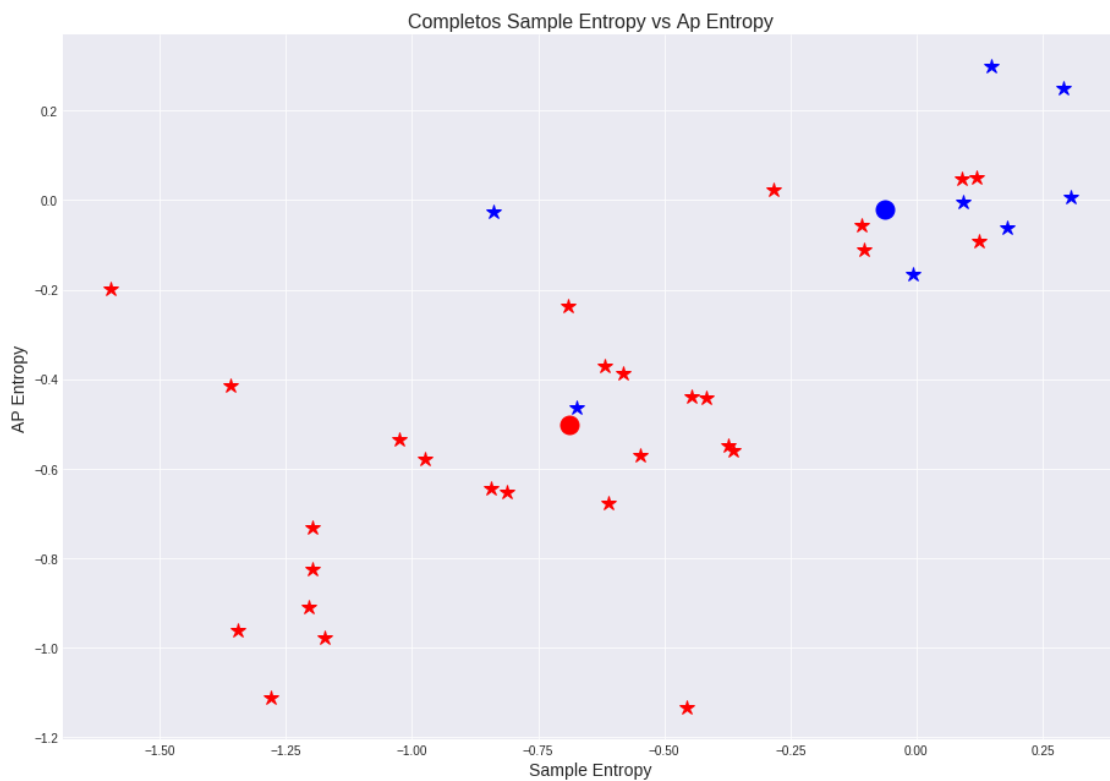
         plt.style.use('seaborn-darkgrid')

12

```
# Act=jovenes[jovenes['Cuestionario']=='HIGH']
# Sed=jovenes[jovenes['Cuestionario']=='LOW']
axes.plot(ActComplete['PendienteSamp'],ActComplete['PendienteAp'],'*',markersize=12,co

axes.plot(LowComplete['PendienteSamp'],LowComplete['PendienteAp'],'*',markersize=12,co
axes.plot(LowComplete['PendienteSamp'].mean(),LowComplete['PendienteAp'].mean(),'o',ma
axes.plot(ActComplete['PendienteSamp'].mean(),ActComplete['PendienteAp'].mean(),'o',ma

plt.title('Completos Sample Entropy vs Ap Entropy',fontsize=16)
plt.xlabel('Sample Entropy',fontsize=14)
plt.ylabel('AP Entropy',fontsize=14)
```

Out[17]: Text(0, 0.5, 'AP Entropy')


```
In [19]: fig=plt.figure()
         axes=fig.add_axes([0.1,0.1,2,2])

         plt.style.use('seaborn-darkgrid')
         # Act=jovenes[jovenes['Cuestionario']=='HIGH']
         # Sed=jovenes[jovenes['Cuestionario']=='LOW']
         axes.plot(ActComplete['PendienteSamp'],ActComplete['PendienteFuzz'],'*',markersize=12

         axes.plot(LowComplete['PendienteSamp'],LowComplete['PendienteFuzz'],'*',markersize=12
```
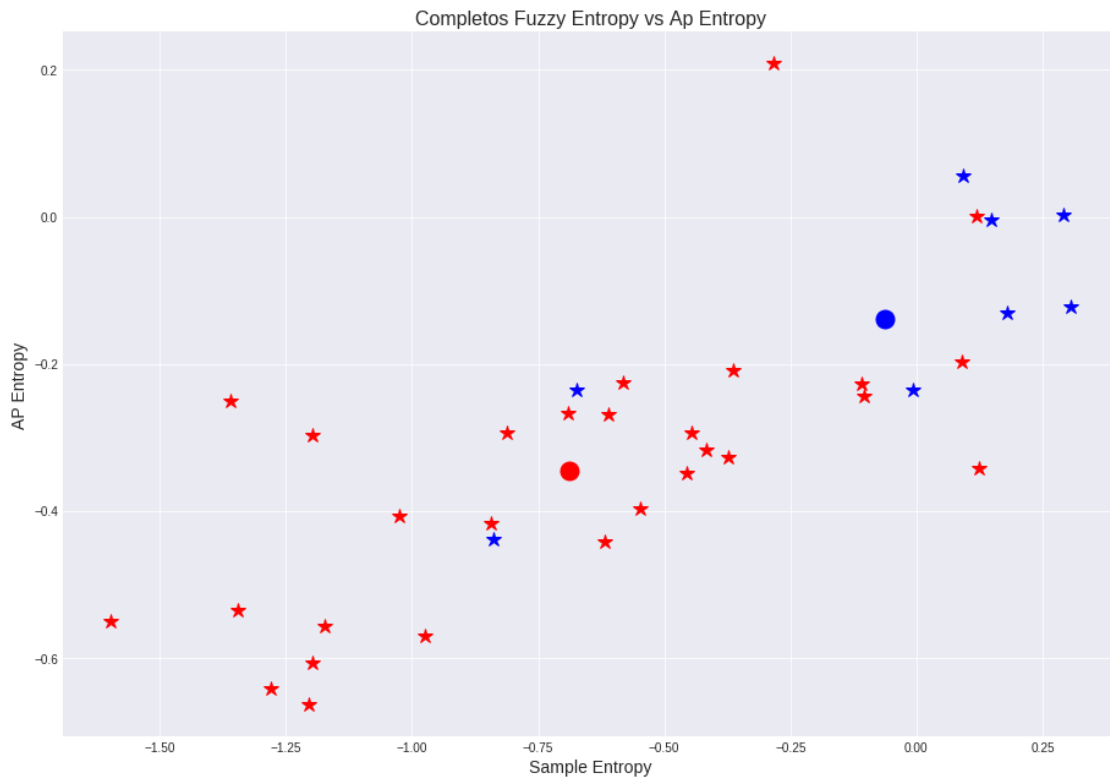
```
axes.plot(LowComplete['PendienteSamp'].mean(),LowComplete['PendienteFuzz'].mean(),'o'
axes.plot(ActComplete['PendienteSamp'].mean(),ActComplete['PendienteFuzz'].mean(),'o'

plt.title('Completos Fuzzy Entropy vs Ap Entropy',fontsize=16)
plt.xlabel('Sample Entropy',fontsize=14)
plt.ylabel('AP Entropy',fontsize=14)
```

Out[19]: Text(0, 0.5, 'AP Entropy')

Completos Fuzzy Entropy vs Ap Entropy

In [ ]:

In [ ]:

In [ ]:

In [ ]:

In [ ]: