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Course & Section: CPE 019 - CPE32S9

```
import pandas as pd
heartFailureFile = '/content/heart_failure_clinical_records_dataset.csv'
heartFailureFrame = pd.read_csv(heartFailureFile, sep = ",")
```

```
heartFailureFrame.head()
```

	age	anaemia	creatinine_phosphokinase	diabetes	ejection_fraction	high_blood_pressure	platelets	serum_creatinine	serum_sodium
0	75.0	0	582	0	20	1	265000.00	1.9	130
1	55.0	0	7861	0	38	0	263358.03	1.1	136
2	65.0	0	146	0	20	0	162000.00	1.3	129
3	50.0	1	111	0	20	0	210000.00	1.9	137
4	65.0	1	160	1	20	0	327000.00	2.7	116

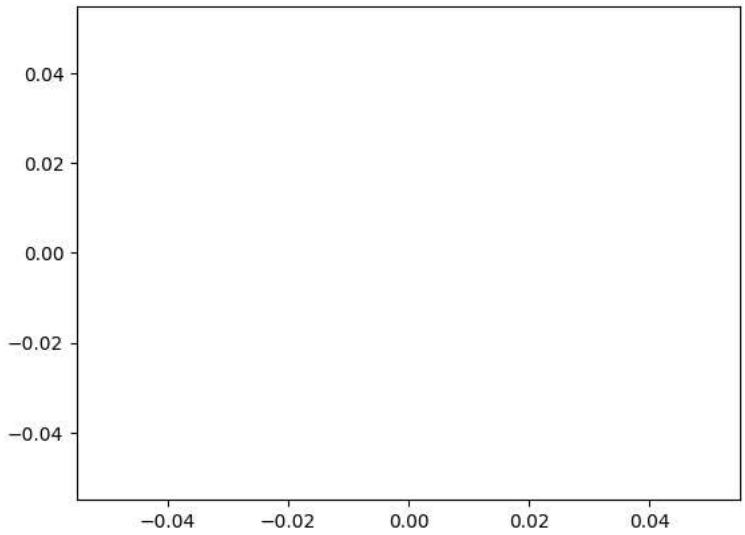
```
heartFailureFrame.describe()
```

	age	anaemia	creatinine_phosphokinase	diabetes	ejection_fraction	high_blood_pressure	platelets	serum_creatinine	serum_s
.000000	299.000000	299.000000	299.000000	299.000000	299.000000	299.000000	299.000000	299.00000	299.0
.833893	0.431438	581.839465	0.418060	38.083612	0.351171	263358.029264	1.39388	136.6
.894809	0.496107	970.287881	0.494067	11.834841	0.478136	97804.236869	1.03451	4.4
.000000	0.000000	23.000000	0.000000	14.000000	0.000000	25100.000000	0.50000	113.0
.000000	0.000000	116.500000	0.000000	30.000000	0.000000	212500.000000	0.90000	134.0
.000000	0.000000	250.000000	0.000000	38.000000	0.000000	262000.000000	1.10000	137.0
.000000	1.000000	582.000000	1.000000	45.000000	1.000000	303500.000000	1.40000	140.0
.000000	1.000000	7861.000000	1.000000	80.000000	1.000000	850000.000000	9.40000	148.0

```
import numpy as np
import matplotlib.pyplot as plt
```

```
diabetic = heartFailureFrame[(heartFailureFrame.diabetes == '1')]
nondiabetic = heartFailureFrame[(heartFailureFrame.diabetes == '0')]
```

```
diabeticMean = diabetic[["age", "anaemia", "high_blood_pressure"]].mean(axis=1)
plt.scatter(diabeticMean, diabetic["DEATH_EVENT"])
plt.show()
%matplotlib inline
```




```
heartFailureFrame.corr(method='pearson')
```

	age	anaemia	creatinine_phosphokinase	diabetes	ejecti
age	1.000000	0.088006	-0.081584	-0.101012	
anaemia	0.088006	1.000000	-0.190741	-0.012729	
creatinine_phosphokinase	-0.081584	-0.190741	1.000000	-0.009639	
diabetes	-0.101012	-0.012729	-0.009639	1.000000	
ejection_fraction	0.060098	0.031557	-0.044080	-0.004850	
high_blood_pressure	0.093289	0.038182	-0.070590	-0.012732	
platelets	-0.052354	-0.043786	0.024463	0.092193	
serum_creatinine	0.159187	0.052174	-0.016408	-0.046975	
serum_sodium	-0.045966	0.041882	0.059550	-0.089551	
sex	0.065430	-0.094769	0.079791	-0.157730	
smoking	0.018668	-0.107290	0.002421	-0.147173	
time	-0.224068	-0.141414	-0.009346	0.033726	
DEATH_EVENT	0.253729	0.066270	0.062728	-0.001943	

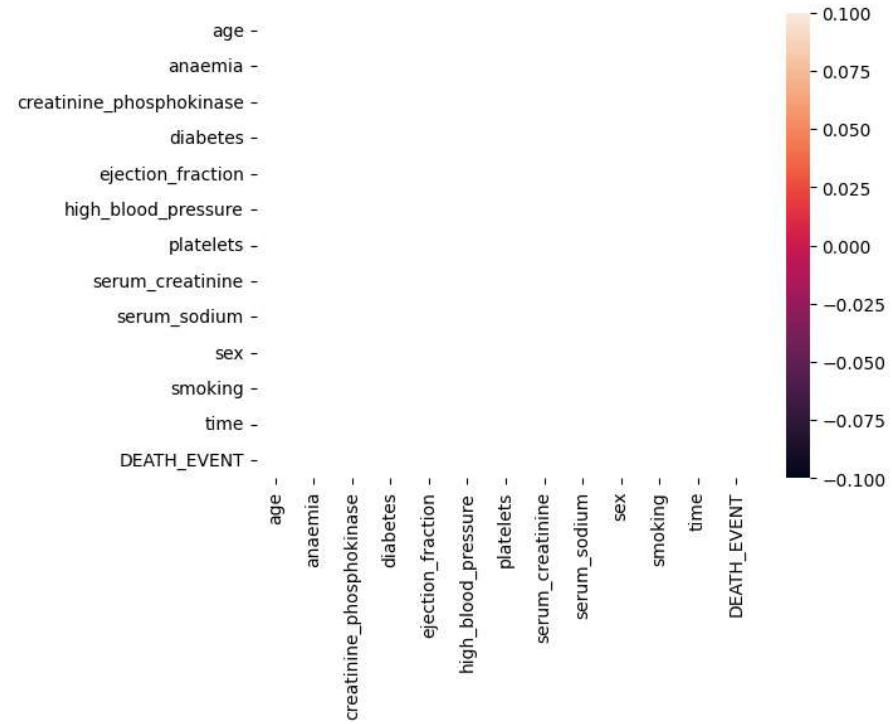
```
!pip install seaborn
```

```
Requirement already satisfied: seaborn in /usr/local/lib/python3.10/dist-packages (0.13.1)
Requirement already satisfied: numpy!=1.24.0,>=1.20 in /usr/local/lib/python3.10/dist-packages (from seaborn) (1.23.5)
Requirement already satisfied: pandas>=1.2 in /usr/local/lib/python3.10/dist-packages (from seaborn) (1.5.3)
Requirement already satisfied: matplotlib!=3.6.1,>=3.4 in /usr/local/lib/python3.10/dist-packages (from seaborn) (3.7.1)
Requirement already satisfied: contourpy>=1.0.1 in /usr/local/lib/python3.10/dist-packages (from matplotlib!=3.6.1,>=3.4->seaborn) (1.2
Requirement already satisfied: cycler>=0.10 in /usr/local/lib/python3.10/dist-packages (from matplotlib!=3.6.1,>=3.4->seaborn) (0.12.1)
Requirement already satisfied: fonttools>=4.22.0 in /usr/local/lib/python3.10/dist-packages (from matplotlib!=3.6.1,>=3.4->seaborn) (4.
Requirement already satisfied: kiwisolver>=1.0.1 in /usr/local/lib/python3.10/dist-packages (from matplotlib!=3.6.1,>=3.4->seaborn) (1.
Requirement already satisfied: packaging>=20.0 in /usr/local/lib/python3.10/dist-packages (from matplotlib!=3.6.1,>=3.4->seaborn) (23.2
Requirement already satisfied: pillow>=6.2.0 in /usr/local/lib/python3.10/dist-packages (from matplotlib!=3.6.1,>=3.4->seaborn) (9.4.0)
Requirement already satisfied: pyparsing>=2.3.1 in /usr/local/lib/python3.10/dist-packages (from matplotlib!=3.6.1,>=3.4->seaborn) (3.1
Requirement already satisfied: python-dateutil>=2.7 in /usr/local/lib/python3.10/dist-packages (from matplotlib!=3.6.1,>=3.4->seaborn)
Requirement already satisfied: pytz>=2020.1 in /usr/local/lib/python3.10/dist-packages (from pandas>=1.2->seaborn) (2023.4)
Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.10/dist-packages (from python-dateutil>=2.7->matplotlib!=3.6.1,>=3.4-
```

```
import seaborn as sns

wcorr = diabetic.corr()
sns.heatmap(wcorr)
```

```
<Axes: >
```




```
import seaborn as sns

wcorr = nondiabetic.corr()
sns.heatmap(wcorr)
```

```
/usr/local/lib/python3.10/dist-packages/seaborn/matrix.py:202: RuntimeWarning: All-NaN
  vmin = np.nanmin(calc_data)
/usr/local/lib/python3.10/dist-packages/seaborn/matrix.py:207: RuntimeWarning: All-NaN
  vmax = np.nanmax(calc_data)
<Axes: >
```