

```
In [2]: print('Name: Tejaswi')
print('Plot a heatmap which help you visualize percentage of blood leaving the
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```

Name: Tejaswi

Plot a heatmap which help you visualize percentage of blood leaving the heart at each contraction of a smoking and non smoking person heart

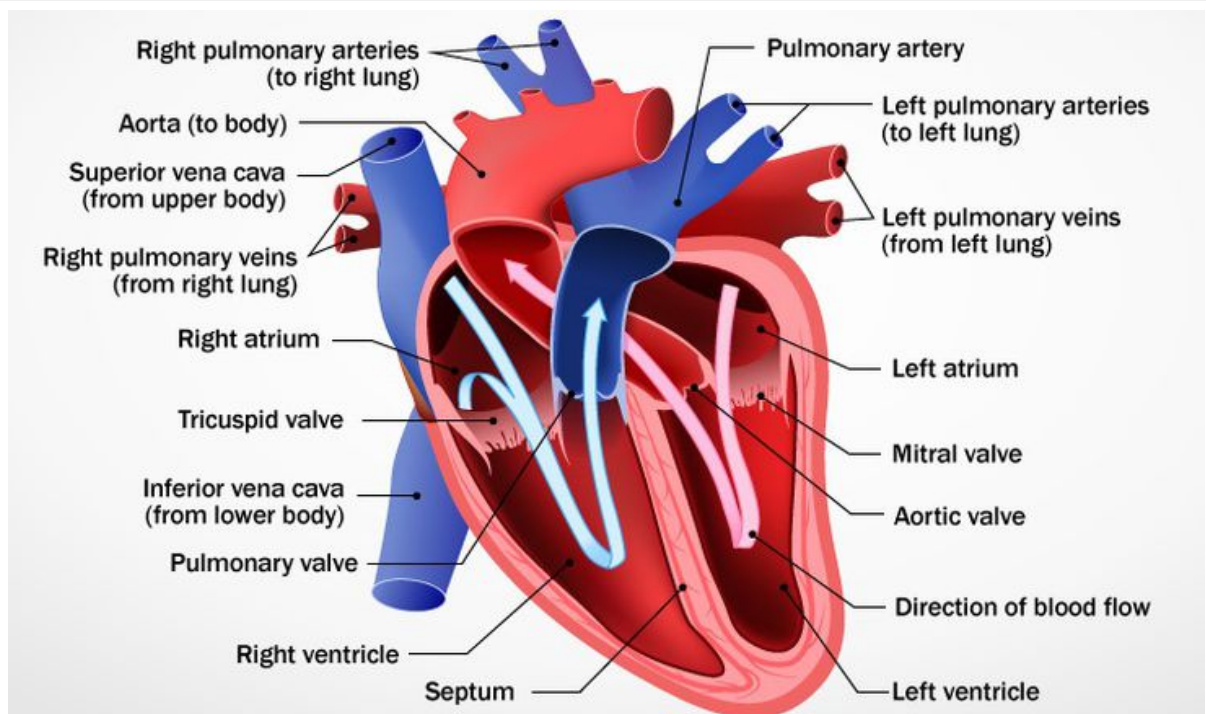
Plot a heatmap which help you visualize Percentage of blood leaving the heart at each contraction of person who died due to cardio vascular disease

Task 1 - Plot heat map to visualize percentage of blood leaving the heart at each contraction of a smoking and non smoking person

A normal, healthy heart will never completely empty, but it will pump out 55-70 percent of the blood that's inside it. An ejection fraction of 55-70 percent is normal; 40-55 percent is below normal. Anything less than 40 percent may indicate heart failure, and below 35 percent there's a risk for life-threatening arrhythmias

```
In [43]: #predefine code for image
from IPython.display import Image
Image(filename='heart.png')
#predefine code end
```

Out[43]:



The right side of your heart receives oxygen-poor blood from your veins and pumps it to your lungs, where it picks up oxygen and gets rid of carbon dioxide. The left side of your heart receives oxygen-rich blood from your lungs and pumps it through your arteries to the rest of your

body.

In [3]: *# Import all the libraries and read heart_failure_clinical_records_dataset.csv*

```
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns

dataframe = pd.read_csv('heart_failure_clinical_records_dataset.csv')
dataframe
```

Out[3]:

	age	anaemia	creatinine_phosphokinase	diabetes	ejection_fraction	high_blood_pressure		
0	75.0	0	582	0	20		1	2
1	55.0	0	7861	0	38		0	2
2	65.0	0	146	0	20		0	1
3	50.0	1	111	0	20		0	2
4	65.0	1	160	1	20		0	3
...	
294	62.0	0	61	1	38		1	1
295	55.0	0	1820	0	38		0	2
296	45.0	0	2060	1	60		0	7
297	45.0	0	2413	0	38		0	1
298	50.0	0	196	0	45		0	3

299 rows × 13 columns



In [6]: *#Group by age and smokers and find the average ejection_fraction rate*

```
smoking_heart_dataframe = dataframe.groupby(['age','smoking'])['ejection_fraction'].mean()
smoking_heart_dataframe
```

Out[6]:

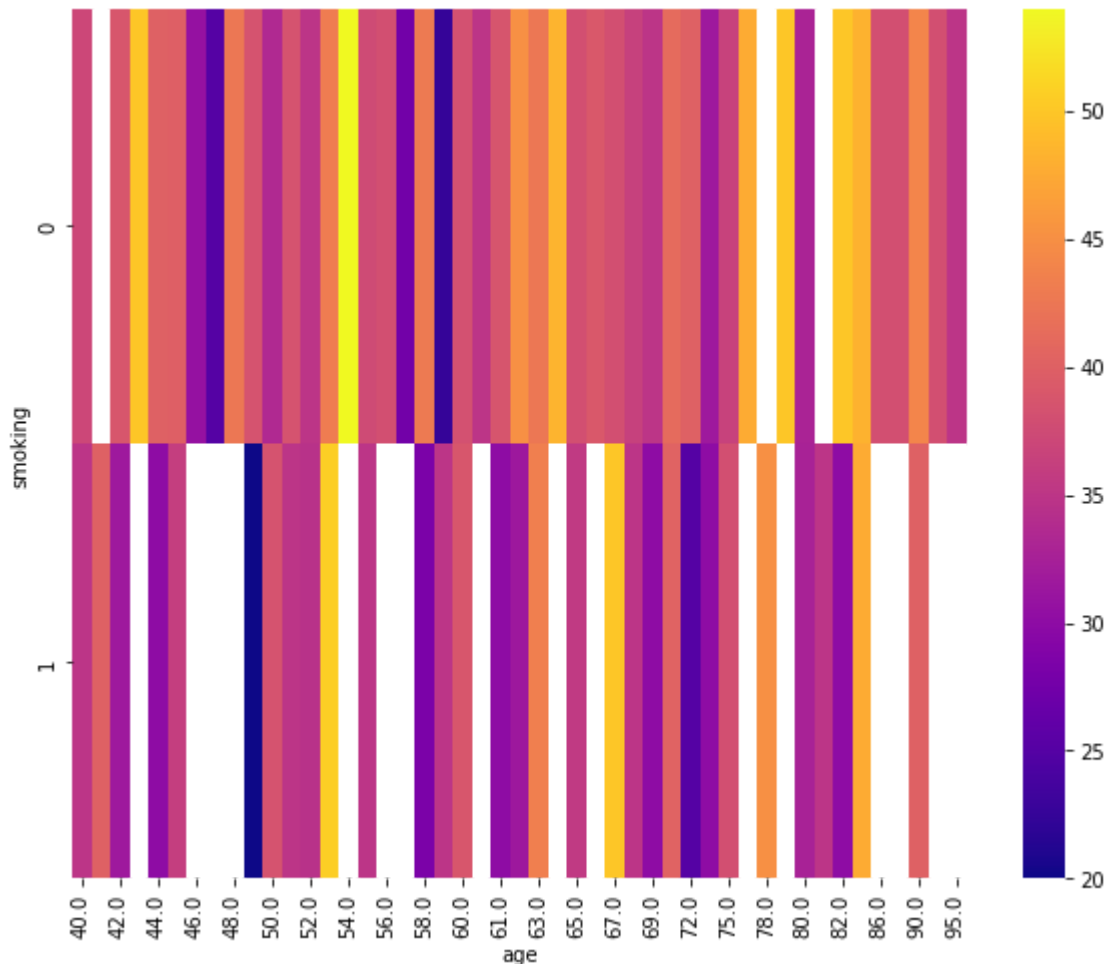
	age	smoking	ejection_fraction
0	40.0	0	37.000000
1	40.0	1	35.000000
2	41.0	1	40.000000
3	42.0	0	38.750000
4	42.0	1	31.666667
...
70	87.0	0	38.000000
71	90.0	0	44.000000
72	90.0	1	40.000000
73	94.0	0	38.000000
74	95.0	0	35.000000

75 rows × 3 columns

```
In [11]: # Plot a heatmap to show the ejection fraction rate in smokers and non smokers
```

```
plt.figure(figsize = (10,8))  
heatmap_df = pd.pivot_table(values = 'ejection_fraction' , index = 'smoking', c  
  
sns.heatmap(heatmap_df, cmap = 'plasma')
```

```
Out[11]: <AxesSubplot:xlabel='age', ylabel='smoking'>
```



0 are non smokers and 1 are smokers

Conclusion - =

Task 2 Plot a heatmap to visualize percentage of blood leaving the heart at each contraction of people who died due to cardio vascular disease

```
In [14]: #Group by death events and ejection fraction rate and find the average ejection
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns

dataframe = pd.read_csv('heart_failure_clinical_records_dataset.csv')
dataframe

death_dataframe = dataframe.groupby(['age' , 'DEATH_EVENT'])['ejection_fraction']
death_dataframe
```

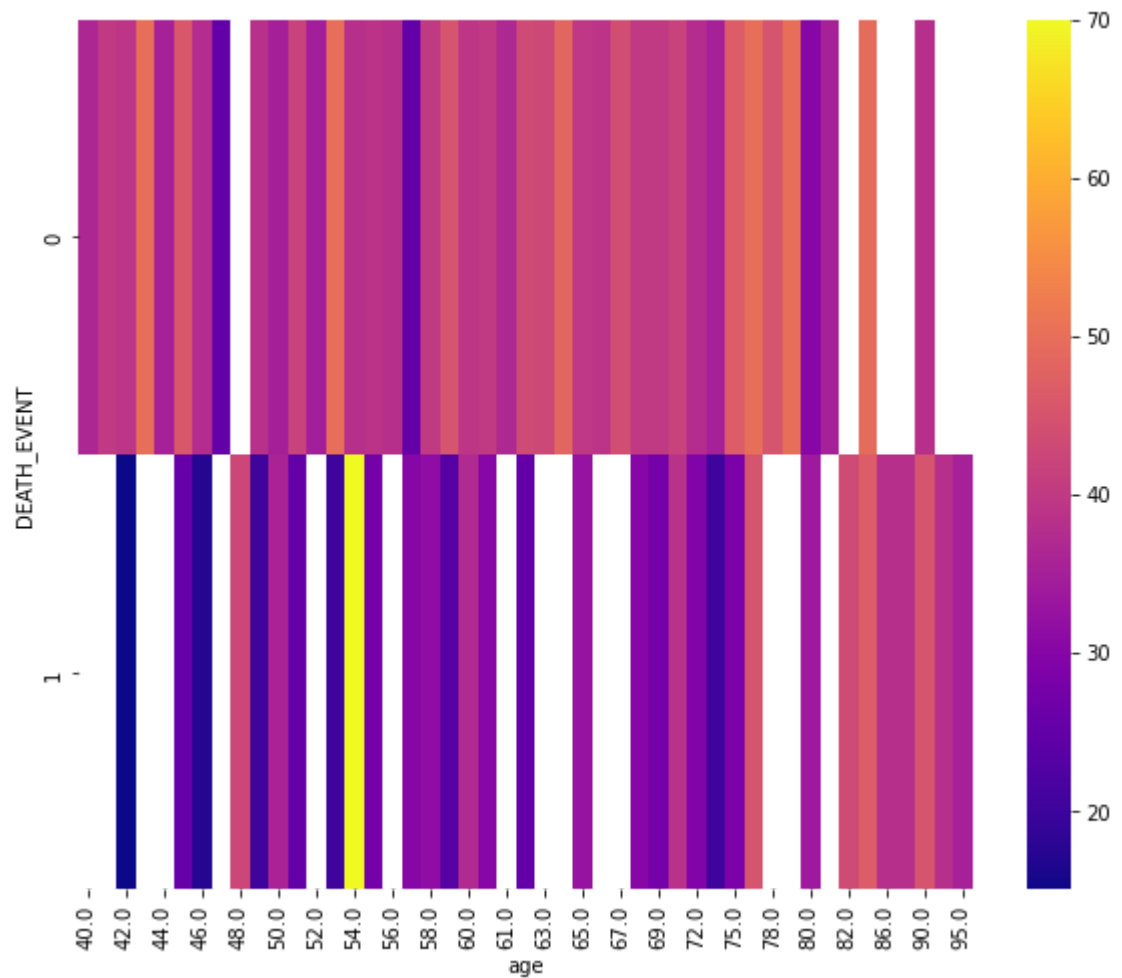
Out[14]:

	age	DEATH_EVENT	ejection_fraction
0	40.0	0	36.428571
1	41.0	0	40.000000
2	42.0	0	39.166667
3	42.0	1	15.000000
4	43.0	0	50.000000
...
68	87.0	1	38.000000
69	90.0	0	38.000000
70	90.0	1	45.000000
71	94.0	1	38.000000
72	95.0	1	35.000000

73 rows × 3 columns

```
In [15]: # Plot a heatmap to show the ejection fraction rate of people who died due to c
plt.figure(figsize = (10,8))
heatmap_df = pd.pivot_table(values = 'ejection_fraction' , index = 'DEATH_EVENT'
sns.heatmap(heatmap_df, cmap = 'plasma')
```

Out[15]: <AxesSubplot:xlabel='age', ylabel='DEATH_EVENT'>



1 are people died due to cardiovascular disease

Conclusion -

In []: