In [166]:

```
print("Name : ")
print("We will be cleaning the big data and make a comparison to show who has a healthier h
print("Also we will be deriviring which age group has the high chances of coronary heart di
```

```
Name :
We will be cleaning the big data and make a comparison to show who has a hea
lthier heart smokers OR non smokers, uisng a line graph
Also we will be deriviring which age group has the high chances of coronary
heart disease in 10 years
```

Task 1 - Plot a line graph to show the difference between heart rate of smokers and non smokers

In [1]:

```
#Import libraries
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
#read the csv
df = pd.read_csv('framingham.csv')
df
```

Out[1]:

	male	age	education	currentSmoker	cigsPerDay	BPMeds	prevalentStroke	prevalentHy
0	1	39	4.0	0	0.0	0.0	0	
1	0	46	2.0	0	0.0	0.0	0	
2	1	48	1.0	1	20.0	0.0	0	
3	0	61	3.0	1	30.0	0.0	0	
4	0	46	3.0	1	23.0	0.0	0	
...	...	...	...	...	...	...	...	.
4233	1	50	1.0	1	1.0	0.0	0	
4234	1	51	3.0	1	43.0	0.0	0	
4235	0	48	2.0	1	20.0	NaN	0	
4236	0	44	1.0	1	15.0	0.0	0	
4237	0	52	2.0	0	0.0	0.0	0	

4238 rows × 16 columns

In [3]:

```
#Filter and make a new dataframe for non smokers
nsmoke = df.loc[df['currentSmoker']==0]
nsmoke
```

Out[3]:

	male	age	education	currentSmoker	cigsPerDay	BPMeds	prevalentStroke	prevalentHy
0	1	39	4.0	0	0.0	0.0	0	
1	0	46	2.0	0	0.0	0.0	0	
5	0	43	2.0	0	0.0	0.0	0	
6	0	63	1.0	0	0.0	0.0	0	
8	1	52	1.0	0	0.0	0.0	0	
...	...	...	...	...	...	...	...	.
4226	1	58	1.0	0	0.0	0.0	0	
4228	0	50	1.0	0	0.0	0.0	0	
4231	1	58	3.0	0	0.0	0.0	0	
4232	1	68	1.0	0	0.0	0.0	0	
4237	0	52	2.0	0	0.0	0.0	0	

2144 rows × 16 columns

In [6]:

```
#Group by age column and find average heart rate at different age
nosmoke = nsmoke.groupby('age')['heartRate'].mean().reset_index()
nosmoke
```

Out[6]:

	age	heartRate
0	33	76.000000
1	34	74.000000
2	35	74.789474
3	36	74.216216
4	37	76.027778
5	38	72.232143
6	39	76.239437
7	40	77.885714
8	41	73.083333
9	42	75.042857
10	43	75.050000
11	44	73.746032
12	45	77.333333
13	46	77.038961
14	47	75.173077
15	48	75.176471
16	49	73.868852
17	50	75.791045
18	51	74.200000
19	52	76.560440
20	53	77.125000
21	54	74.437500
22	55	74.305263
23	56	73.397059
24	57	74.027778
25	58	75.343750
26	59	74.197368
27	60	75.342857
28	61	73.770270
29	62	74.202899
30	63	75.129870
31	64	76.469697
32	65	74.200000

	age	heartRate
33	66	80.714286
34	67	73.448276
35	68	80.166667
36	69	80.500000
37	70	64.000000

In [7]:

```
#Filter and make a new dataframe for smokers
ysmoke = df.loc[df['currentSmoker']==1]
ysmoke
```

Out[7]:

	male	age	education	currentSmoker	cigsPerDay	BPMeds	prevalentStroke	prevalentHy
2	1	48	1.0	1	20.0	0.0	0	
3	0	61	3.0	1	30.0	0.0	0	
4	0	46	3.0	1	23.0	0.0	0	
7	0	45	2.0	1	20.0	0.0	0	
9	1	43	1.0	1	30.0	0.0	0	
...	...	...	...	...	...	...	...	
4230	0	56	1.0	1	3.0	0.0	0	
4233	1	50	1.0	1	1.0	0.0	0	
4234	1	51	3.0	1	43.0	0.0	0	
4235	0	48	2.0	1	20.0	NaN	0	
4236	0	44	1.0	1	15.0	0.0	0	

2094 rows × 16 columns

In [8]:

```
#Group by age column and find average heart rate at different age
yessmoke = ysmoke.groupby('age')['heartRate'].mean().reset_index()
yessmoke
```

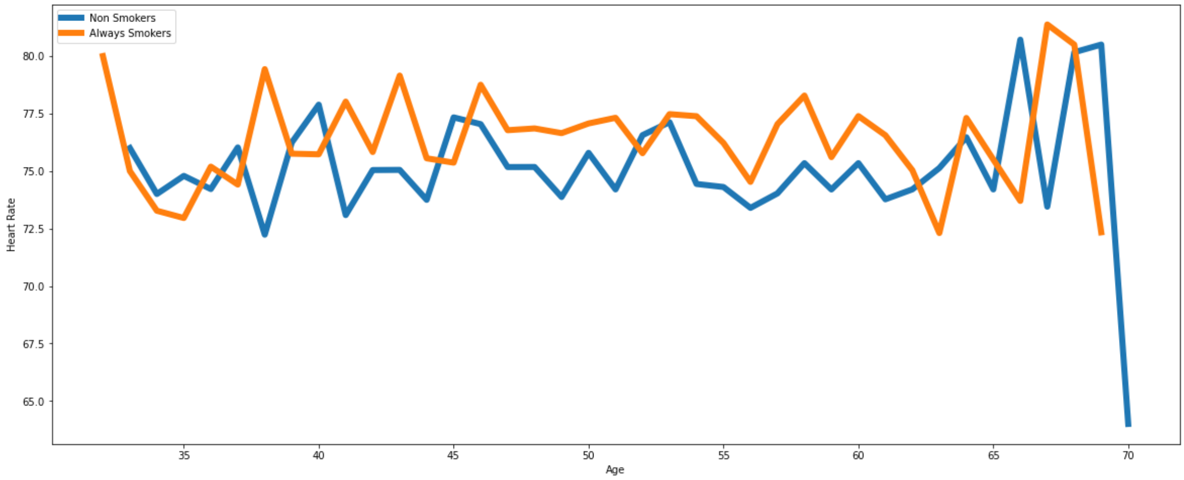
Out[8]:

	age	heartRate
0	32	80.000000
1	33	75.000000
2	34	73.272727
3	35	72.956522
4	36	75.191489
5	37	74.410714
6	38	79.431818
7	39	75.755102
8	40	75.727273
9	41	78.019608
10	42	75.827273
11	43	79.151515
12	44	75.553398
13	45	75.364583
14	46	78.752381
15	47	76.775281
16	48	76.852273
17	49	76.647887
18	50	77.068493
19	51	77.315789
20	52	75.775862
21	53	77.474576
22	54	77.384615
23	55	76.220000
24	56	74.527273
25	57	77.039216
26	58	78.283019
27	59	75.604651
28	60	77.390244
29	61	76.555556
30	62	75.033333
31	63	72.303030
32	64	77.307692

	age	heartRate
33	65	75.500000
34	66	73.700000
35	67	81.375000
36	68	80.500000
37	69	72.333333

In [14]:

```
#Plot a line graph to show the heart rate of smokers vs non smokers
plt.figure(figsize=(20,8))
plt.plot(nosmoke['age'],nosmoke['heartRate'],label='Non Smokers',linewidth=6)
plt.plot(yessmoke['age'],yessmoke['heartRate'],label='Always Smokers',linewidth=6)
plt.xlabel('Age')
plt.ylabel('Heart Rate')
plt.legend()
plt.show()
```



Conslusion - Always Spokers Have 99% Chance To Get An Heart Releated Dieases While Non Smokers Doesnt

Task 2 - Which age group have high chances of having coronary heart disease in 10 years

In [15]:

```
#Read the csv
df=pd.read_csv('framingham.csv')
df
#Filter and make a new dataframe for those who has chances of having coronary heart disease
chd=df.loc[df['TenYearCHD']==1]
chd
```

Out[15]:

	male	age	education	currentSmoker	cigsPerDay	BPMeds	prevalentStroke	prevalentHy
3	0	61	3.0	1	30.0	0.0	0	
6	0	63	1.0	0	0.0	0.0	0	
15	0	38	2.0	1	20.0	0.0	0	
17	0	46	2.0	1	20.0	0.0	0	
25	1	47	4.0	1	20.0	0.0	0	
...	...	...	...	...	...	...	...	.
4221	1	50	1.0	0	0.0	0.0	0	
4223	1	56	4.0	0	0.0	1.0	0	
4226	1	58	1.0	0	0.0	0.0	0	
4232	1	68	1.0	0	0.0	0.0	0	
4233	1	50	1.0	1	1.0	0.0	0	

644 rows × 16 columns

In [17]:

```
#Group by age column and count the rows of TenYearCHD column
cndage=chd.groupby('age')['TenYearCHD'].count().reset_index()
cndage
```

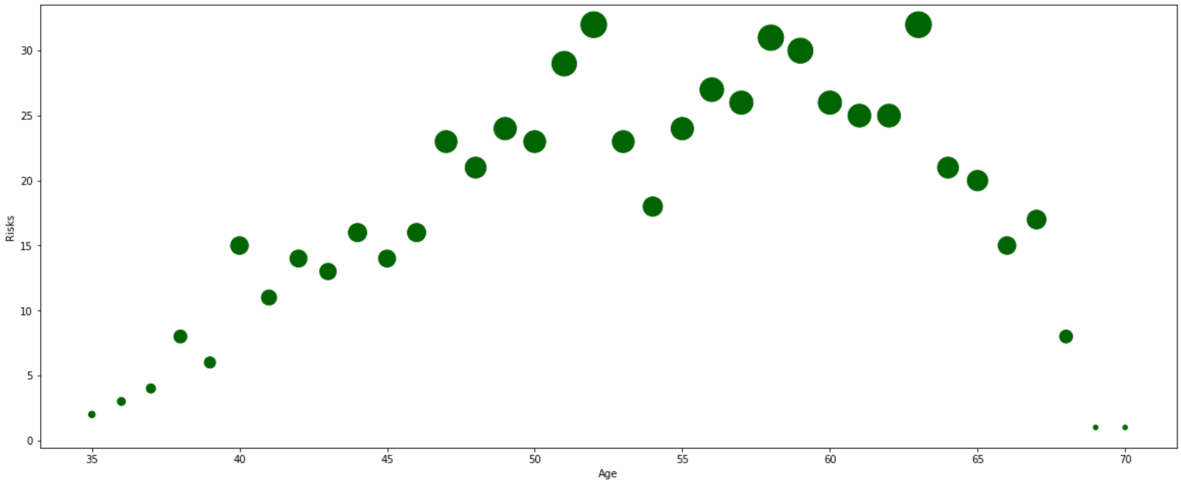
Out[17]:

	age	TenYearCHD
0	35	2
1	36	3
2	37	4
3	38	8
4	39	6
5	40	15
6	41	11
7	42	14
8	43	13
9	44	16
10	45	14
11	46	16
12	47	23
13	48	21
14	49	24
15	50	23
16	51	29
17	52	32
18	53	23
19	54	18
20	55	24
21	56	27
22	57	26
23	58	31
24	59	30
25	60	26
26	61	25
27	62	25
28	63	32
29	64	21
30	65	20
31	66	15
32	67	17

	age	TenYearCHD
33	68	8
34	69	1
35	70	1

```
In [19]:
```

```
#Plot a line graph to show total number of people having a chance of
plt.figure(figsize=(20,8))
plt.scatter(cndage['age'],cndage['TenYearCHD'],color='darkgreen',label='coronary heart dise
plt.xlabel('Age')
plt.ylabel('Risks')
plt.show()
```



Conslusion - 64, 52 is the most risky ages

```
In [ ]:
```