Predicting if a person would buy life insurnace based on his age using logistic regression

```
1 import pandas as pd
2 from matplotlib import pyplot as plt
3 %matplotlib inline
```

```
1 from google.colab import files
2 upload = files.upload()
```
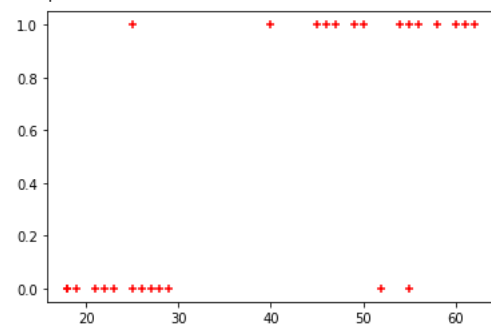
Choose Files | No file chosen   Upload widget is only available when the cell has been executed in the current browser session. Please rerun this cell to enable.
Saving insurance_data.csv to insurance_data.csv

```
1 df = pd.read_csv("insurance_data.csv")
2 df.head()
```

	age	bought_insurance
0	22	0
1	25	0
2	47	1
3	52	0
4	46	1

```
1 plt.scatter(df.age,df.bought_insurance,marker='+',color='red')
```

<matplotlib.collections.PathCollection at 0x7fb5bcd111c0>


```
1 from sklearn.model_selection import train_test_split
```

```
1 X_train, X_test, y_train, y_test = train_test_split(df[['age']],df.bought_insurance,train_size=0.8)
```

```
1
```

```
1 X_test
```

	age
17	58
0	22
21	26
14	49
1	25
22	40

```
1 from sklearn.linear_model import LogisticRegression
2 model = LogisticRegression()
```

```
1 model.fit(X_train, y_train)
```

LogisticRegression()

```
1 X_test
```

	age
17	58
0	22
21	26
14	49
1	25
22	40

```
1 y_predicted = model.predict(X_test)
```

```
1 model.predict_proba(X_test)
```

```
array([[0.10516449, 0.89483551],
       [0.88935889, 0.11064111],
       [0.83406688, 0.16593312],
       [0.25260188, 0.74739812],
       [0.84968069, 0.15031931],
       [0.49288735, 0.50711265]])
```

```
1 model.score(X_test,y_test)
```

```
1.0
```

```
1 y_predicted
```

```
array([1, 0, 0, 1, 0, 1])
```

```
1 X_test
```

	age
17	58
0	22
21	26
14	49
1	25
22	40

model.coef_ indicates value of m in y=m*x + b equation

```
1 model.coef_
```

```
array([[0.11737009]])
```

model.intercept_ indicates value of b in y=m*x + b equation

```
1 model.intercept_
```

```
array([-4.66635117])
```

Lets defined sigmoid function now and do the math with hand

```
1 import math
2 def sigmoid(x):
3   return 1 / (1 + math.exp(-x))
4 def prediction_function(age):
5     z = 0.042 * age - 1.53 # 0.04150133 ~ 0.042 and -1.52726963 ~ -1.53
6     y = sigmoid(z)
7     return y
```

```
7     return y
8 age = 35
9 prediction_function(age)
```

    0.4850044983805899

0.485 is less than 0.5 which means person with 35 age will not buy insurance

```
1 age = 43
2 prediction_function(age)
```

    0.568565299077705

0.485 is more than 0.5 which means person with 43 will buy the insurance

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