**Data Set** – Backpain

Data description: -

back pain can be caused by a variety of problems with any parts of the complex, interconnected network of spinal muscles, nerves, bones, discs or tendons in the lumbar spine. Typical sources of low back pain include:

* The large nerve roots in the low back that go to the legs may be irritated
* The smaller nerves that supply the low back may be irritated
* The large paired lower back muscles (erector spinae) may be strained
* The bones, ligaments or joints may be damaged
* An intervertebral disc may be degenerating

An irritation or problem with any of these structures can cause lower back pain and/or pain that radiates or is referred to other parts of the body. Many lower back problems also cause back muscle spasms, which don't sound like much but can cause severe pain and disability.

While lower back pain is extremely common, the symptoms and severity of lower back pain vary greatly. A simple lower back muscle strain might be excruciating enough to necessitate an emergency room visit, while a degenerating disc might cause only mild, intermittent discomfort.

This data set is about to identify a person is abnormal or normal using collected physical spine details/data.

**Attribute information: -**

'pelvic\_incidence',

'pelvictilt',

'lumbar\_lordosis\_angle',

'sacral\_slope',

'pelvic\_radius',

'degree\_spondylolisthesis',

'pelvic\_slope',

'Direct\_tilt',

'thoracic\_slope',

'cervical\_tilt',

'sacrum\_angle',

'scoliosis\_slope',

'Status'

**In class Assignment Expectations/Steps -**

**Part 1:**

* Load the data using Python Pandas library.
* Perform Exploratory Data Analysis and provide detailed inference.

**Part 2:**

* Build Logistic Regression Model.

**Part 3:**

* Evaluate the model using classification\_report and Confusion Matrix
* Calculate

o Classification Accuracy:

o Classification Error: (Also known as "Misclassification Rate")

o Sensitivity

o Specificity

o False Positive Rate

o Precision

* Print the first 25 actual and predicted values (Variable Y)

**Part 4:**

* Explain in detail about ROC (with X axis and Y axis)
* Evaluate the model using ROC
* Define a function that accepts a threshold and prints sensitivity and specificity