In [1]:
```python
import numpy as np

# Given data
X = np.array([
    [80, 5, 3],
    [100, 7, 3.5],
    [90, 6, 3.2],
    [110, 8, 4],
    [95, 6.5, 3.8]
])

Y = np.array([45, 50, 48, 55, 50])  # Muscle Mass Percentage

# Hyperparameters
alpha = 0.05  # Regularization strength
eta = 0.0001  # Learning rate
iterations = 3  # Number of iterations

# Initialize parameters
w = np.zeros(3)  # Weights
b = 0  # Bias
m = X.shape[0]  # Number of samples

# Perform 3 iterations of Lasso Regression
for i in range(iterations):
    y_pred = np.dot(X, w) + b  # Predicted values
    error = Y - y_pred  # Compute error

    # Compute gradients
    dw = (-2/m) * np.dot(X.T, error) + alpha * np.sign(w)
    db = (-2/m) * np.sum(error)

    # Update weights and bias
    w -= eta * dw
    b -= eta * db

    # Compute Mean Squared Error
    mse = np.mean(error**2)

    # Display iteration results
    print(f"Iteration {i+1}: w = {w}, b = {b}, MSE = {mse}")

# Final prediction
new_x = np.array([105, 7.5, 3.6])
prediction = np.dot(new_x, w) + b
print(f"Predicted Muscle Mass Percentage: {prediction}")
```

```
Iteration 1: w = [0.9488   0.06512  0.034944], b = 0.00992, MSE = 2470.8
Iteration 2: w = [0.15532712 0.01042311 0.00576749], b = 0.0017016991999999967, MSE =
1729.4160502124075
Iteration 3: w = [0.81892235 0.05592557 0.03021113], b = 0.00865255626951296, MSE = 1
210.9308839005898
Predicted Muscle Mass Percentage: 86.52370084219642
```

In [ ]: