

Pseudocode

Algorithm: SimpleLinearRegression

Input:

X (independent variable)
y (dependent variable)
a (learning rate)
T (number of iterations)

Output:

m (slope)
c (intercept)

```
Initialize m = 0
Initialize c = 0

for i = 1 to T do
    y_hat = m * X + c
    error = y_hat - y

    dm = (1/n) * sum(error * X)
    dc = (1/n) * sum(error)

    m = m - a * dm
    c = c - a * dc
end for

return m, c
```

Python Code

```
import numpy as np

def simple_linear_regression(X, y, alpha=0.01, iterations=1000):
    n = len(X)
    m = 0
    c = 0

    for _ in range(iterations):
        y_hat = m * X + c
```

```
error = y_hat - y

dm = (1 / n) * np.sum(error * X)
dc = (1 / n) * np.sum(error)

m = m - alpha * dm
c = c - alpha * dc

return m, c
```