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El número de muestras y la alfa usada están correlacionadas negativamente. A medida que se incrementa el número de muestras, la alfa puede quedar obsoleta si no se disminuye, causando errores en los cálculos de los coeficientes propuestos.

```
m = 10
alpha = .01
```

```
Iteration:  1

final params: [2.6988544300535824, 5.767260468248669, 3.068406038195087, 0.3695516081415076]
Average square error: 2.5045096101200515
Estimated Y for [1, 4, 2, 8] : 34.86112124457049
```

```
m = 50
alpha = .01
```

```
Iteration:  1

final params: [nan, nan, nan, nan]
Average square error: nan
Estimated Y for [1, 4, 2, 8] : nan
```

```
m = 50
alpha = .0001
```

```
Iteration:  1

final params: [0.8266065493570572, 4.046385024499528, 3.219778475142468, 2.3931719257854183]
Average square error: 2.2186943014535365
Estimated Y for [1, 4, 2, 8] : 42.59707900392345
```

```
56   m = 500
57   alpha = .0001
58   epochs = 0
```

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```
Iteration:  1

final params: [nan, nan, nan, nan]
Average square error: nan
Estimated Y for [1, 4, 2, 8] : nan
```

De igual forma, tal cómo se esperaba, al aumentar el número de muestras se obtiene un modelo más preciso.

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```
56   m = 10
57   alpha = .0001
```

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```
Iteration:  1

final params: [0.7191874640013785, 4.189369874448406, 3.4701824104470123, 2.7509949464456342]
Average square error: 13.691840313317176
Estimated Y for [1, 4, 2, 8] : 46.424991354254104

Iteration:  2

final params: [0.8368499076336481, 4.344356821799914, 3.507506914166258, 2.6706570065326085]
Average square error: 0.7688598978598453
Estimated Y for [1, 4, 2, 8] : 46.59454707542669

Iteration:  3

final params: [1.1633503251444526, 4.5053010285054516, 3.341950703360993, 2.178600378216537]
Average square error: 0.1869634420993064
Estimated Y for [1, 4, 2, 8] : 43.29725887162054
```

```
56   m = 50
57   alpha = .0001
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL JUPYTER

```
Iteration:  1

final params: [0.31180557694453936, 3.5517748416299297, 3.239969264685395, 2.928163687740853]
Average square error: 3.4405096621651605
Estimated Y for [1, 4, 2, 8] : 44.42415297476187

Iteration:  2

final params: [0.44242941911037575, 3.670722794021287, 3.2282933749109133, 2.785863955800531]
Average square error: 0.8314939782345825
Estimated Y for [1, 4, 2, 8] : 43.8688189914216

Iteration:  3

final params: [0.6133390526070324, 3.8385888024218566, 3.2252497498148194, 2.611910697207774]
Average square error: 0.4855777892274504
Estimated Y for [1, 4, 2, 8] : 43.313479339586294
```

```
56    m = 100
57    alpha = .0001
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL JUPYTER

```
Iteration:  1

final params: [0.22138342441162592, 3.4250780566421852, 3.2036946322305573, 2.982311207818931]
Average square error: 0.3300186643259632
Estimated Y for [1, 4, 2, 8] : 44.18757457799293

Iteration:  2

final params: [0.3912302863433439, 3.5918244621205573, 3.200594175777204, 2.8093638894338686]
Average square error: 0.5292401650609575
Estimated Y for [1, 4, 2, 8] : 43.63462760185093

Iteration:  3

final params: [0.5255845570859018, 3.722557601767082, 3.196973044681177, 2.6713884875952814]
Average square error: 0.011543310839642787
Estimated Y for [1, 4, 2, 8] : 43.180868954278836
```

A pesar de que la precisión pudiera converger, se puede observar que igualmente aumenta la consistencia (exactitud) del modelo a media que se tienen mayores números de muestra, disminuyendo la varianza entre los modelos entrenados con distintos subsets de un mismo dataset.