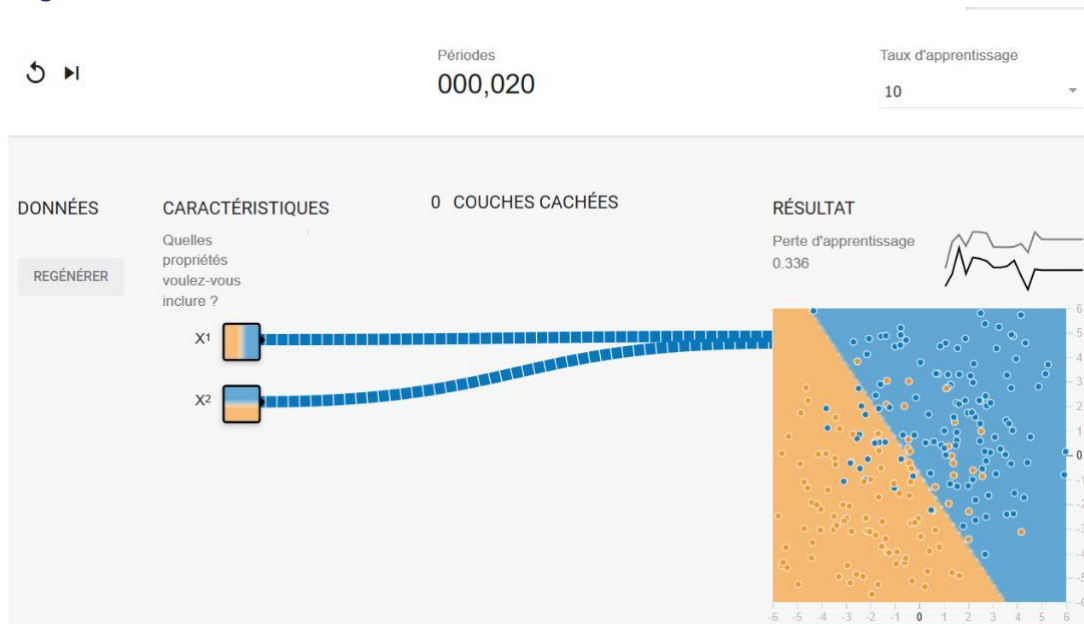


MACHINE LEARNING – LAB 2

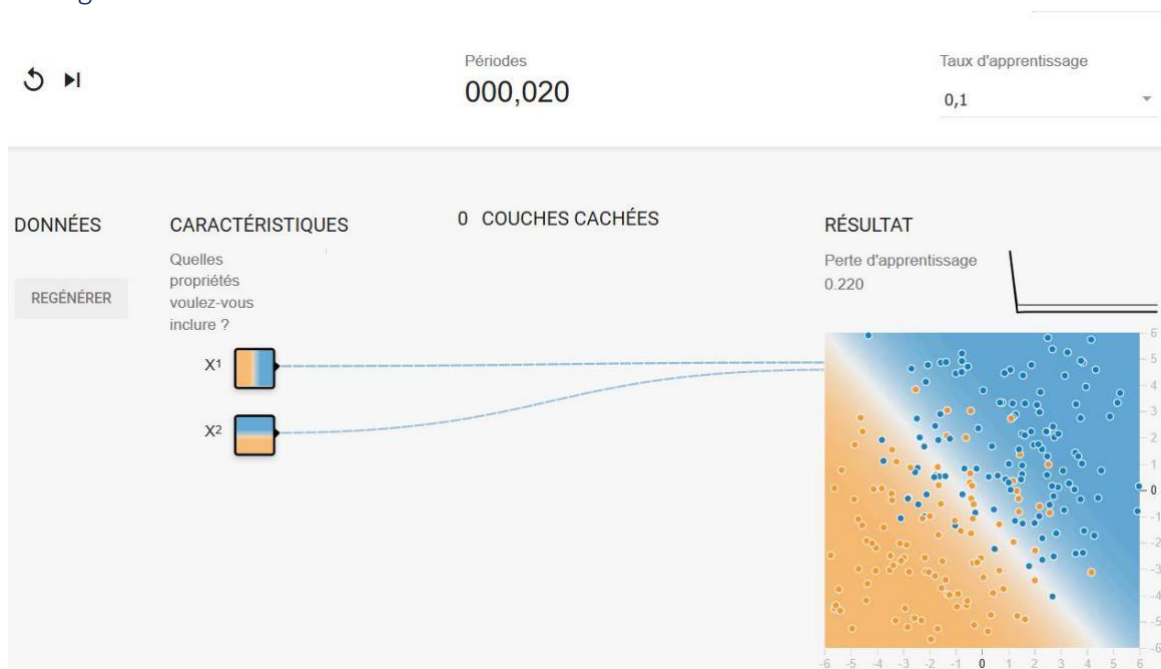
Learning rate

Task 1

Learning rate = 10

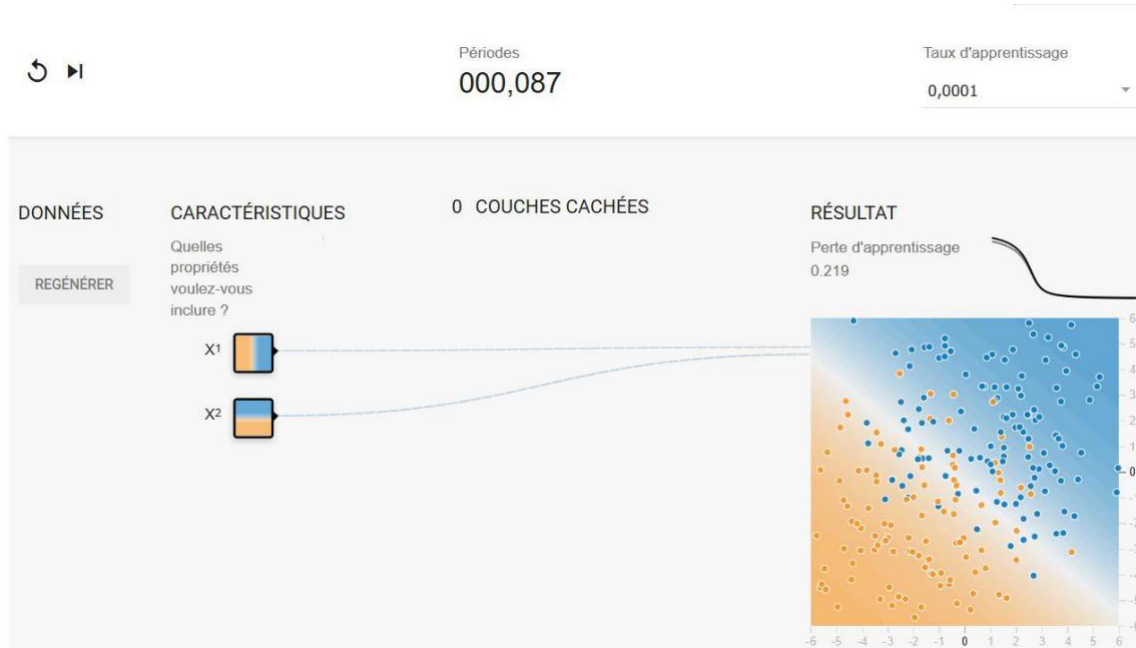


Learning rate = 0.1



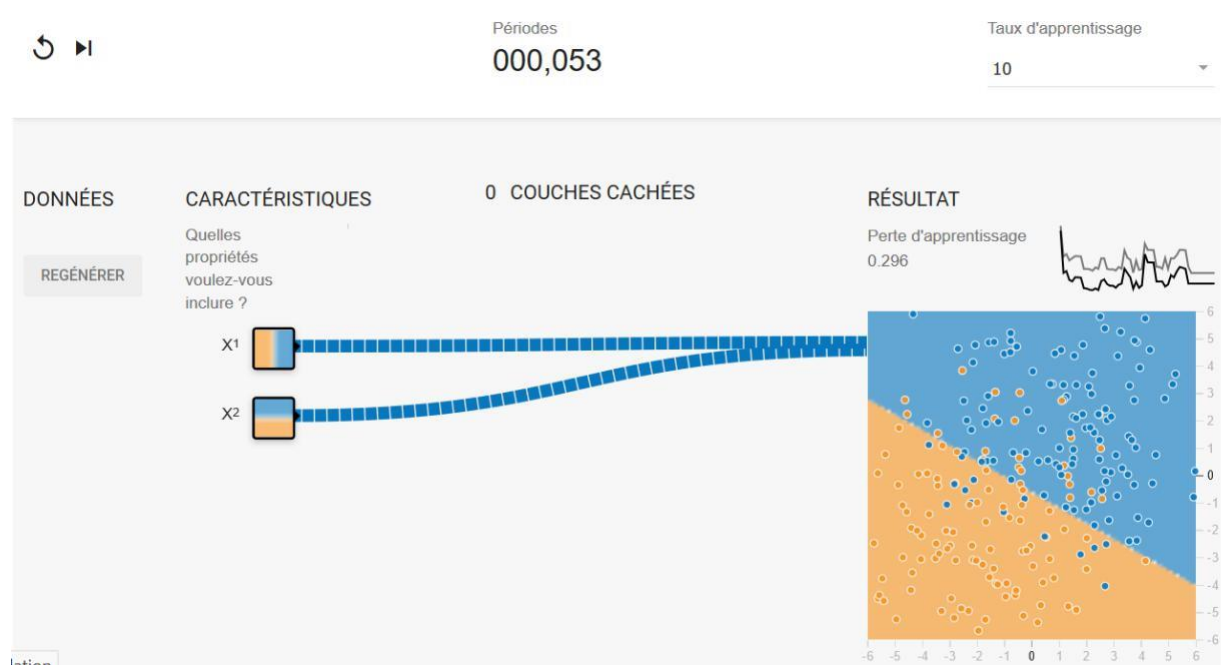
MACHINE LEARNING – LAB 2

Learning rate = 0.0001



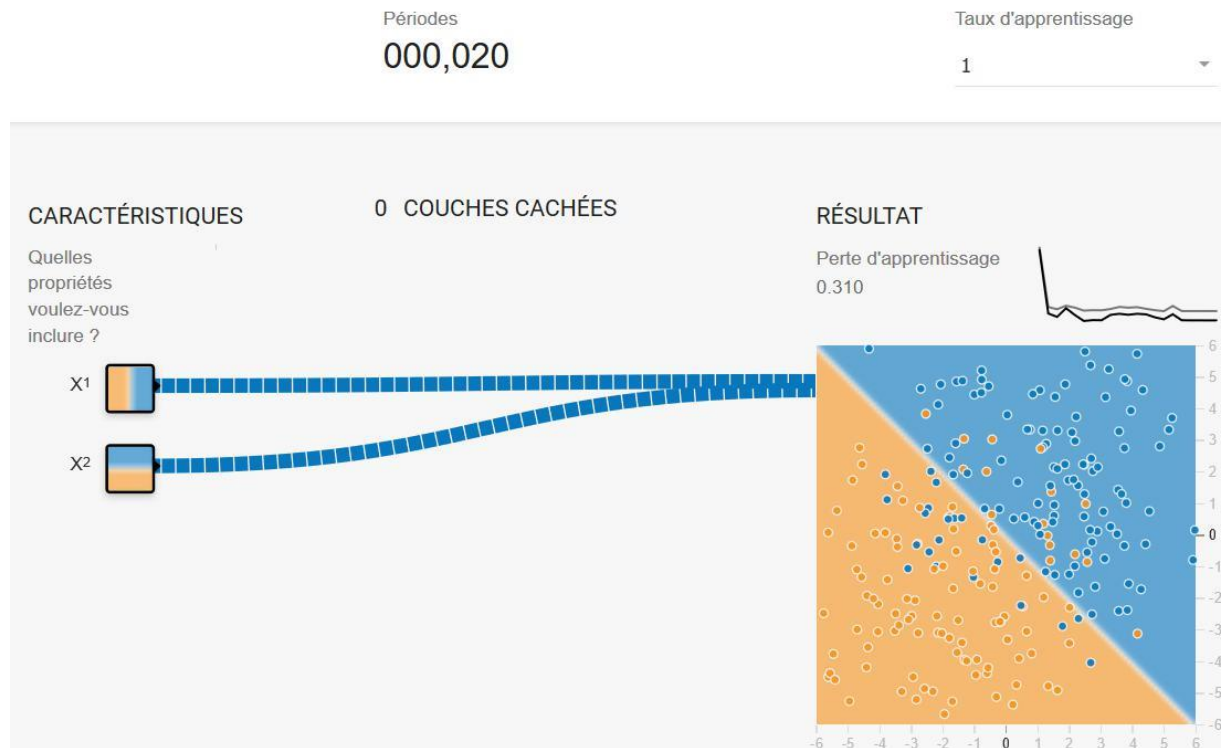
Task 2

Learning rate = 10

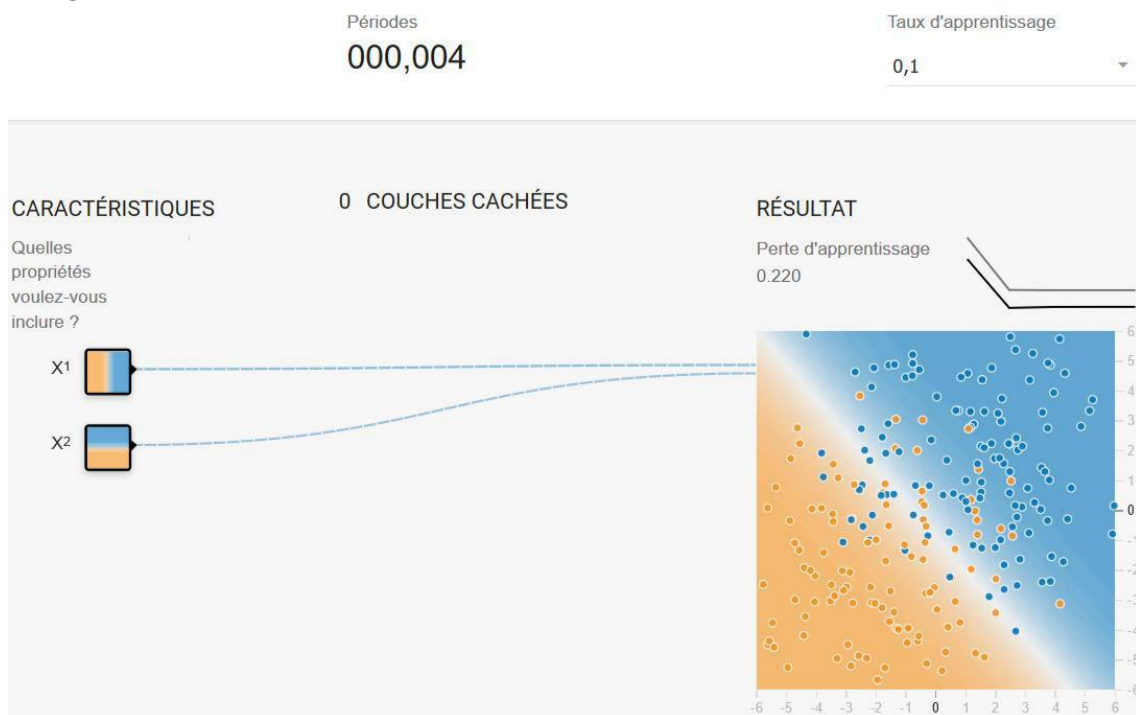


MACHINE LEARNING – LAB 2

Learning rate = 1

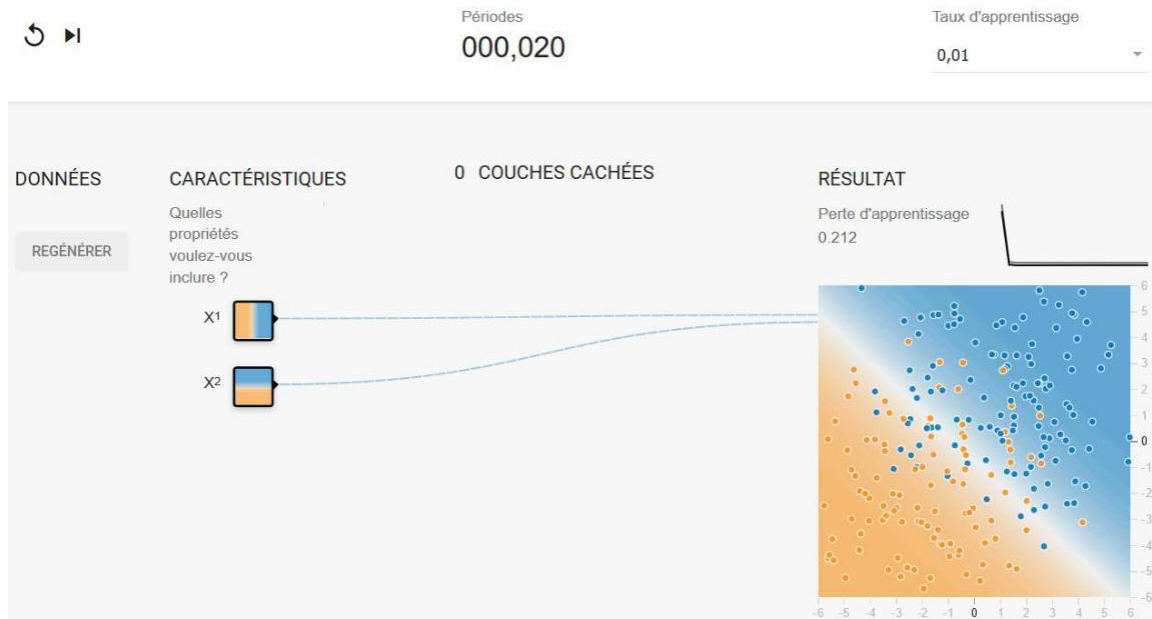


Learning rate = 0.1

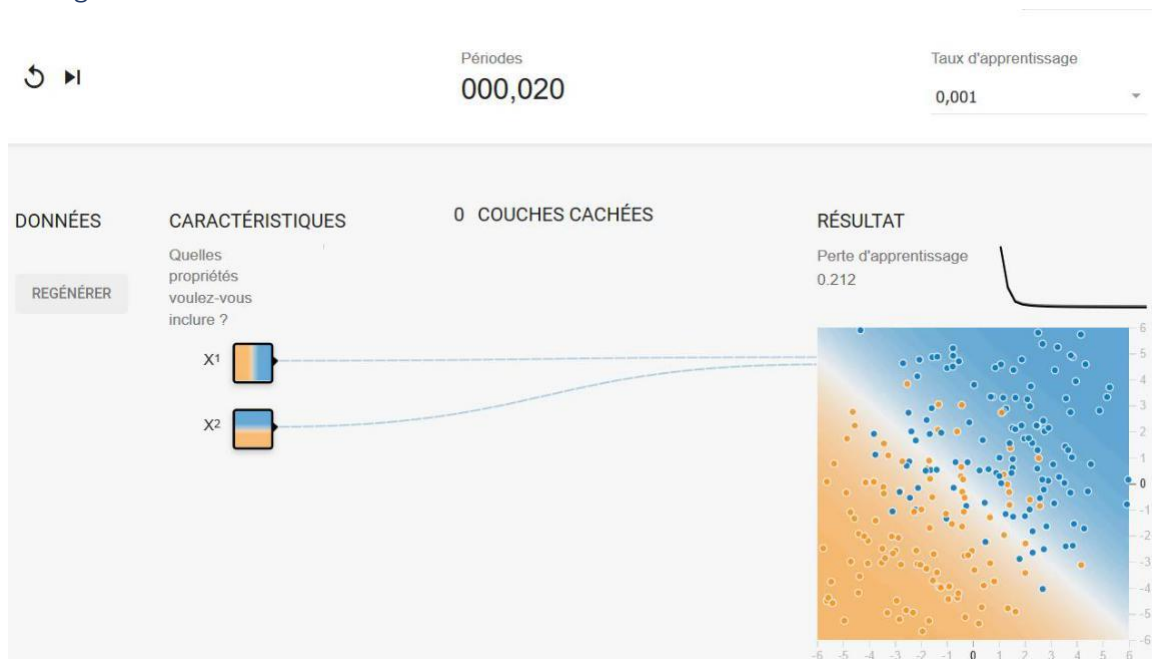


MACHINE LEARNING – LAB 2

Learning rate = 0.01

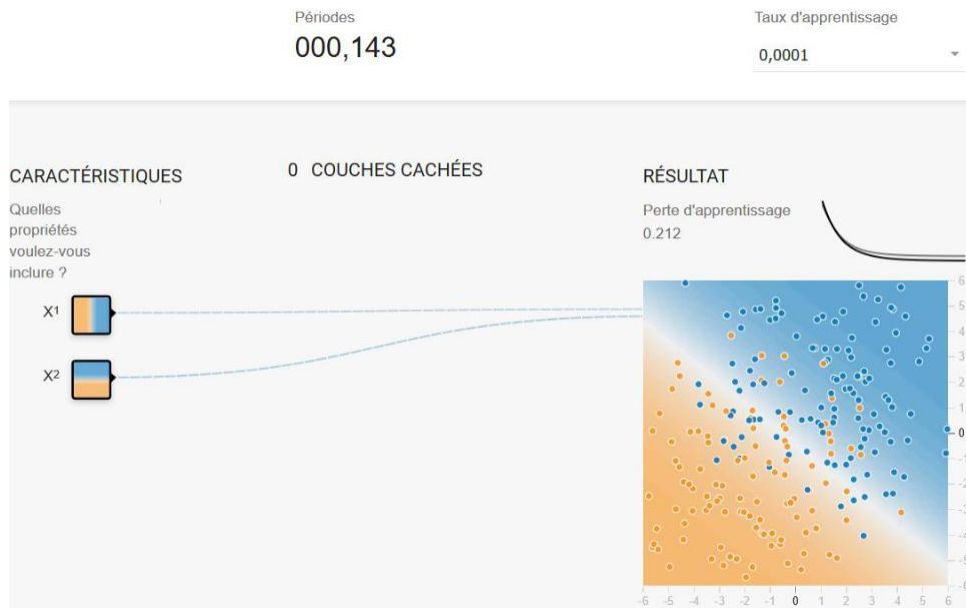


Learning rate = 0.001



MACHINE LEARNING – LAB 2

Learning rate = 0.0001



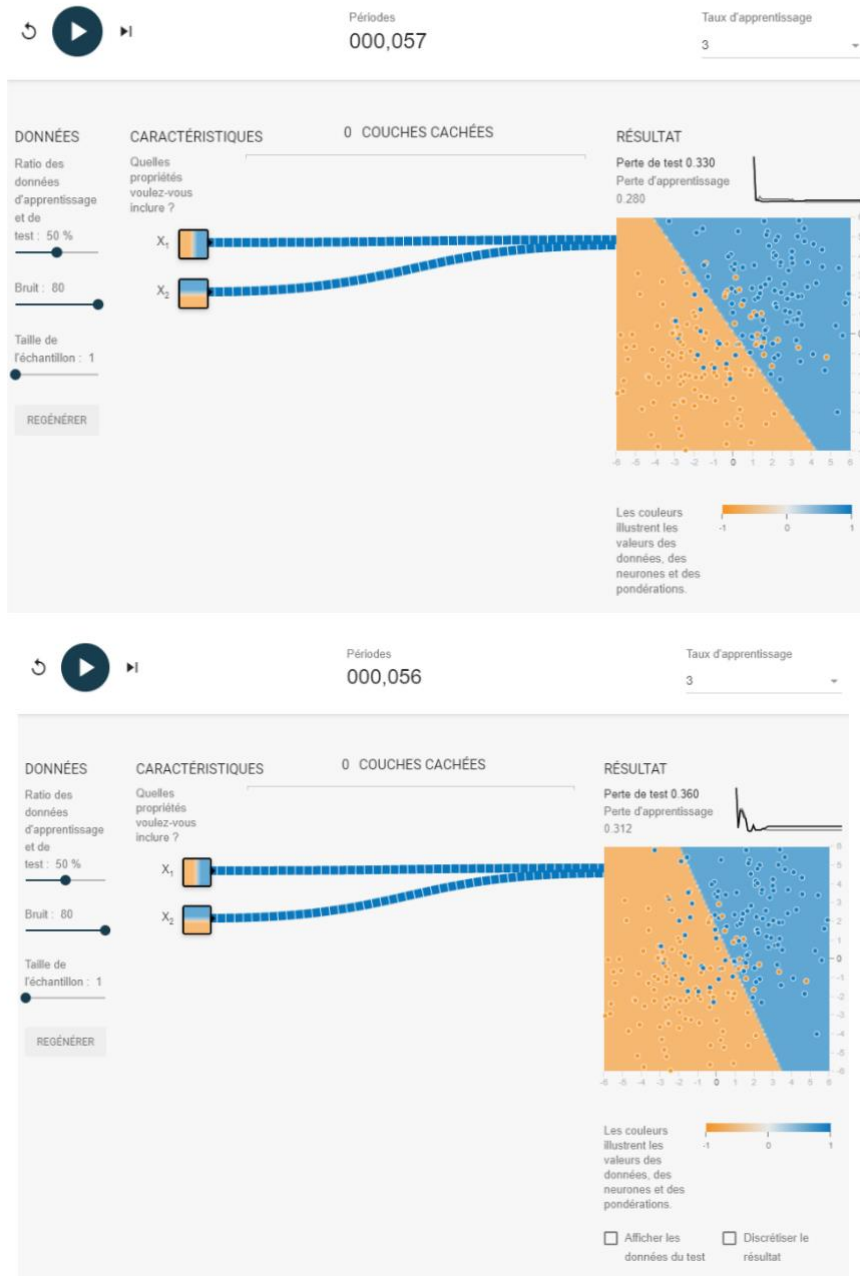
As we diminished the learning rate from 10 to 0.001, we could see that the learning loss tended to 0.212 relatively quickly. Plus, the intensity of trust seems to fade between orange and blue when we lower the learning rate. However, under 0.001 (0.0001 and 0.00001) the learning loss and the diagram spend too much time to get stabilized so these tests were too long to be useful.

MACHINE LEARNING – LAB 2

Training and test sets

Task 1

Training Rate

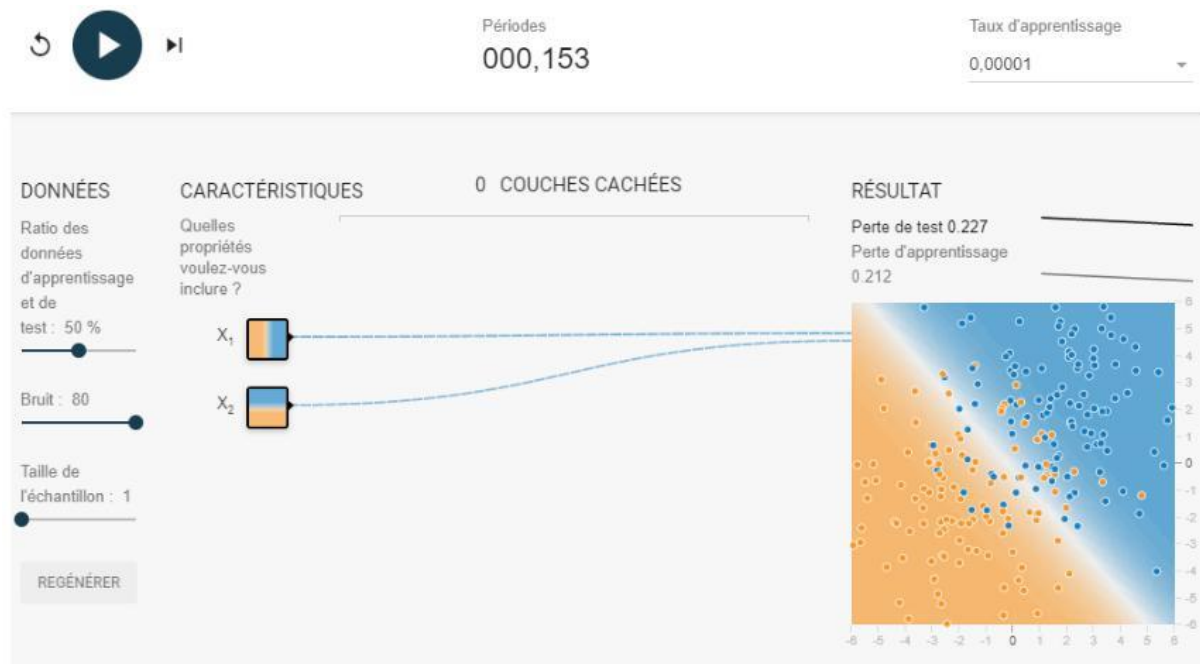


Test loss is approaching training loss after about 50 periods even after many tests

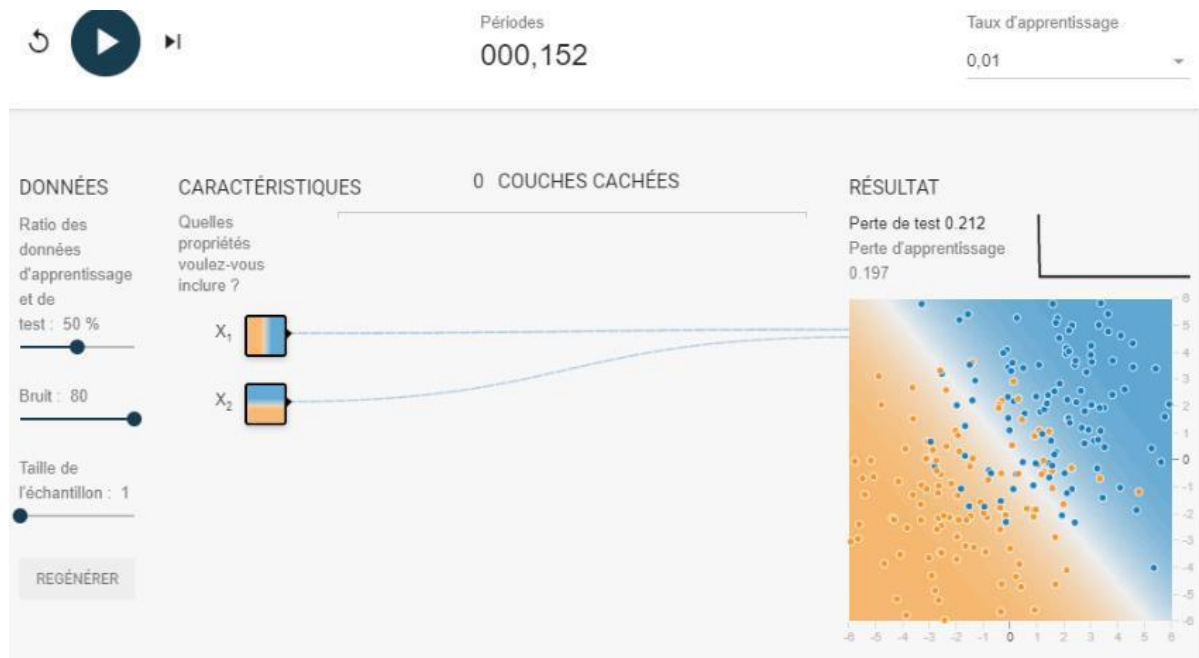
MACHINE LEARNING – LAB 2

Task 2

Learning rate = 0.00001

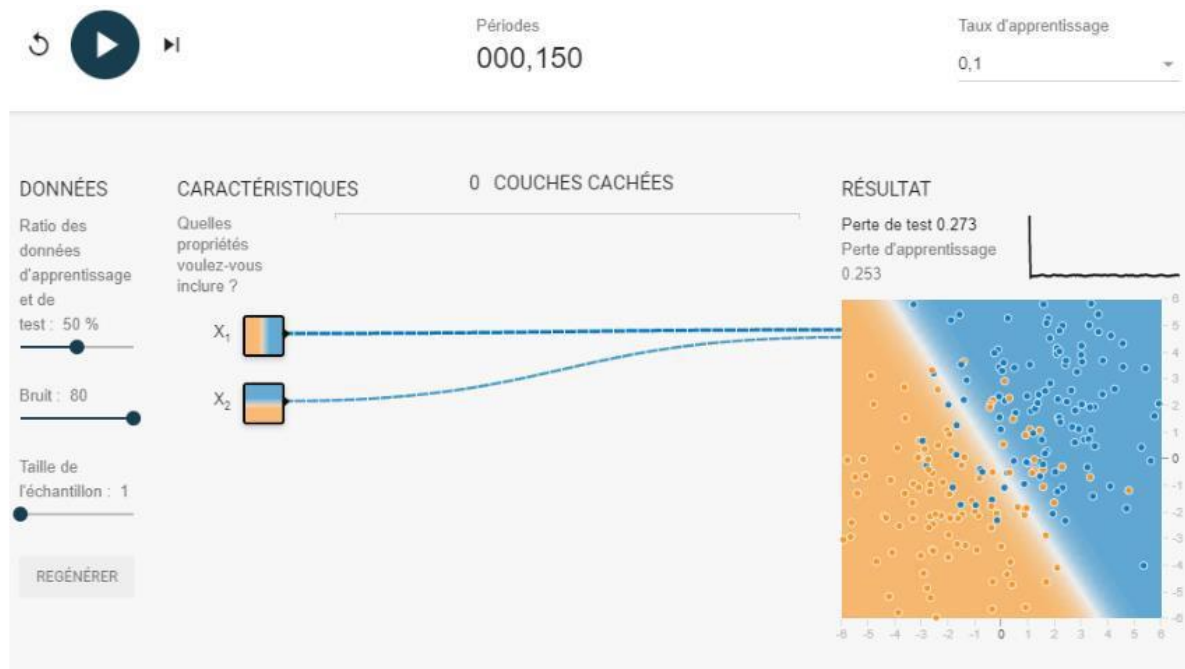


Learning rate = 0.01

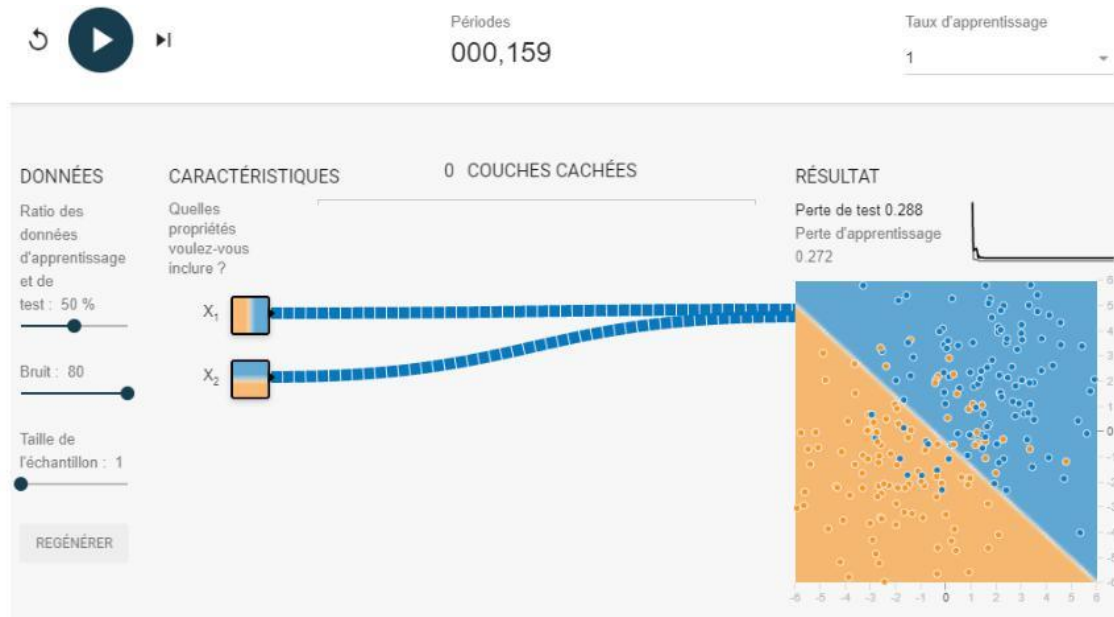


MACHINE LEARNING – LAB 2

Learning rate = 0.1

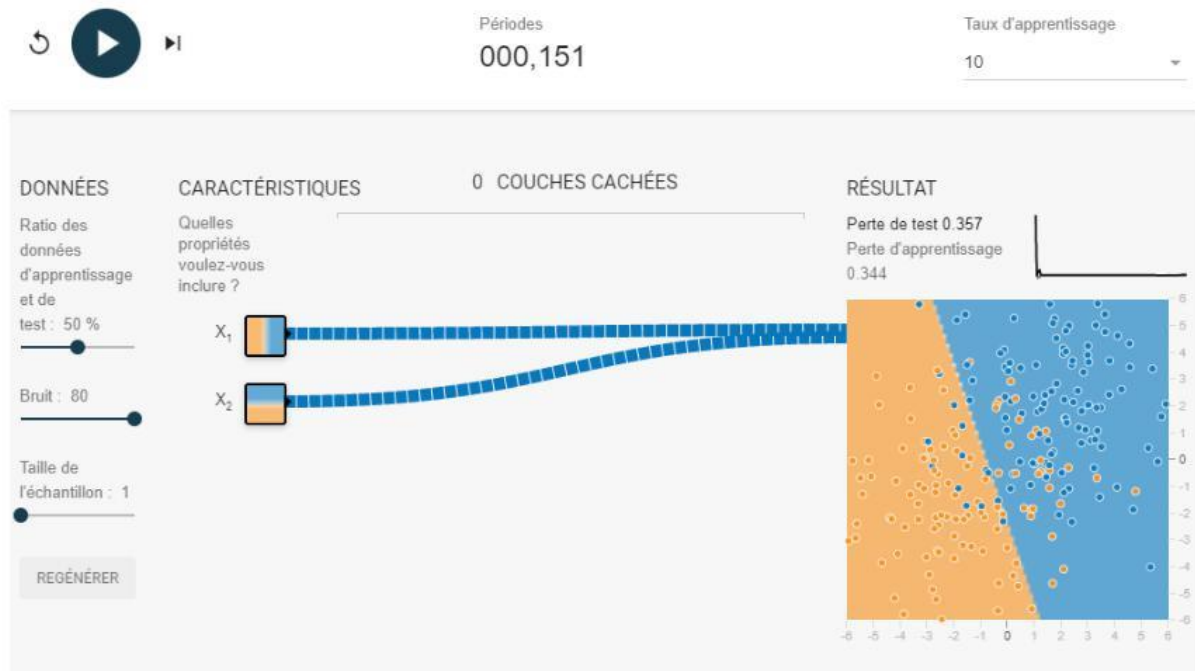


Learning rate = 1



MACHINE LEARNING – LAB 2

Learning rate = 10



The delta between Test loss and Training loss is the same when the periods equal 150 with every learning rate.

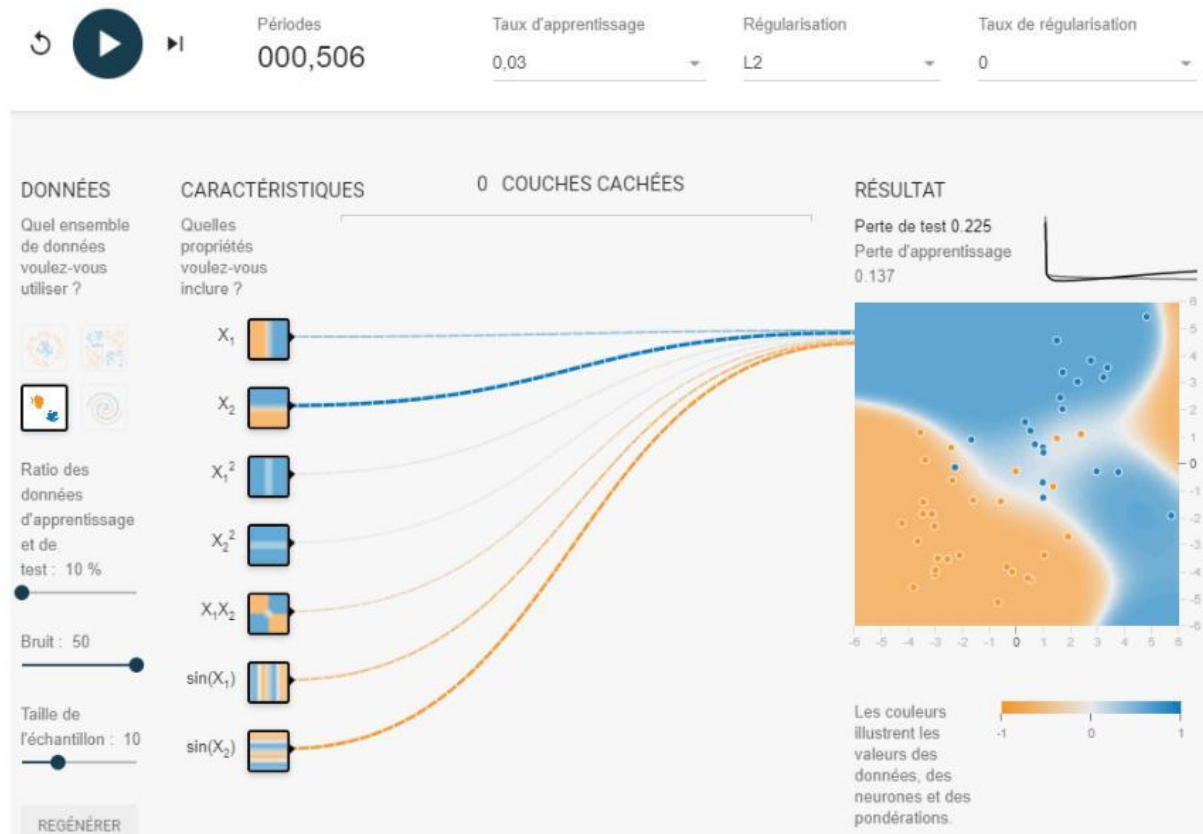
But when the value of the learning rate is 3 the loss of assessment is significantly greater than the loss of learning.

When we modify batch size after 150 periods the delta is the same but When the learning rate is reduced the loss of assessment decreases and approaches the loss of learning.

MACHINE LEARNING – LAB 2

Regularization (simplicity – L2)

Task 1



Weights:

$$X_1 = 0.41$$

$$X_2 = 1.1$$

$$X_1^2 = -0.1$$

$$X_2^2 = 0.046$$

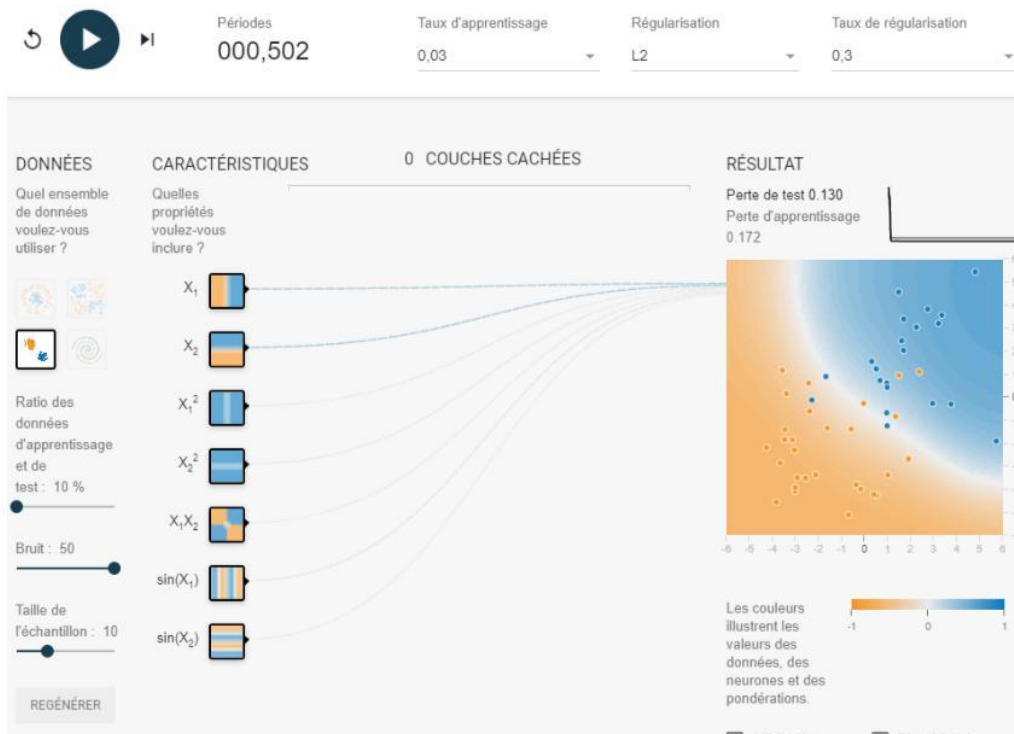
$$X_1 X_2 = -0.27$$

$$\sin(X_1) = -0.53$$

$$\sin(X_2) = -0.92$$

MACHINE LEARNING – LAB 2

Task 2



Weights:

$$X_1 = 0.27$$

$$X_2 = 0.27$$

$$X_1^2 = -0.012$$

$$X_2^2 = -0.025$$

$$X_1X_2 = -0.0028$$

$$\sin(X_1) = -0.063$$

$$\sin(X_2) = -0.00053$$

The evaluation diminishes considerably but the learning loss increases so the distance between them diminishes too.