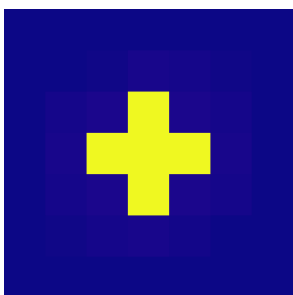
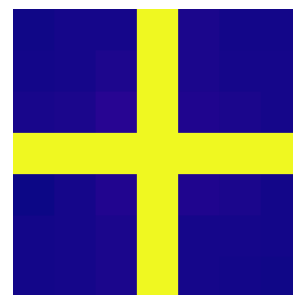


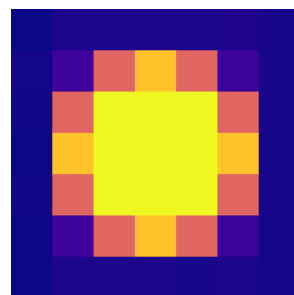
Opération : **ouverture**
Jeu : **MNIST**



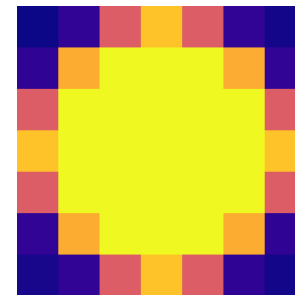
cross3



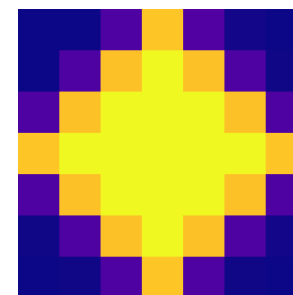
cross7



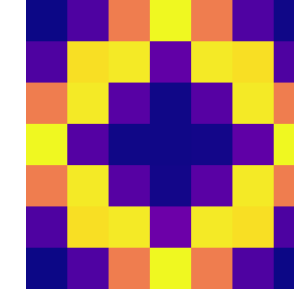
disk2



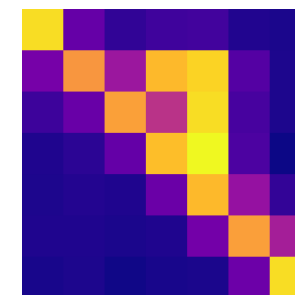
disk3



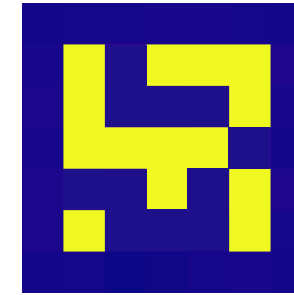
diamond3



complex



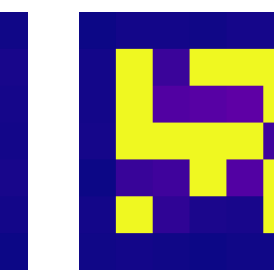
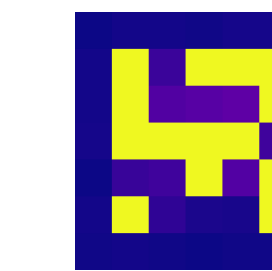
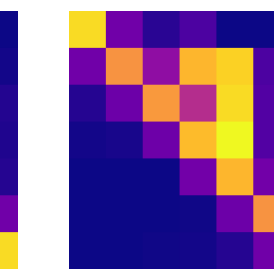
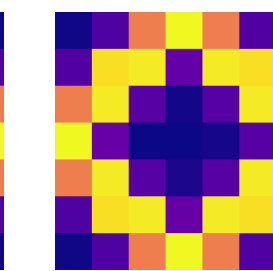
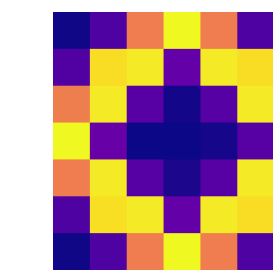
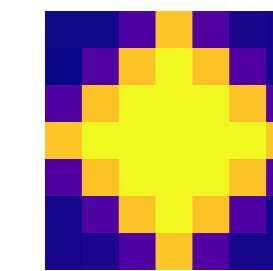
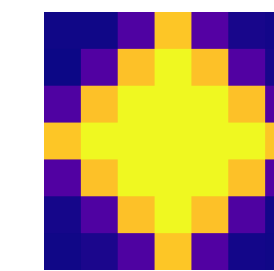
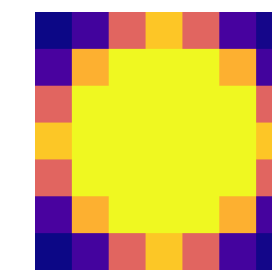
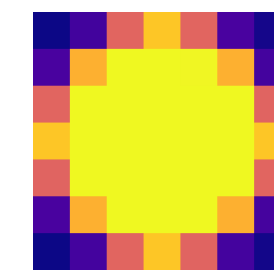
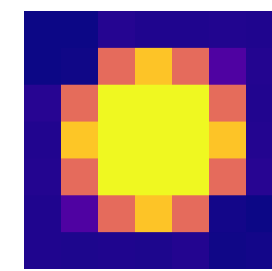
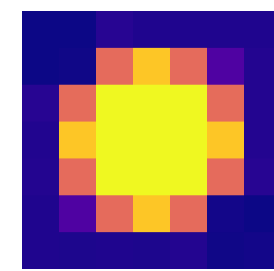
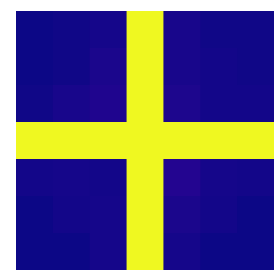
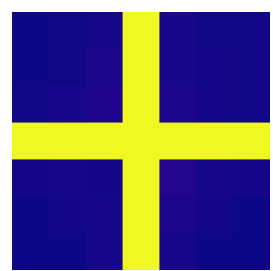
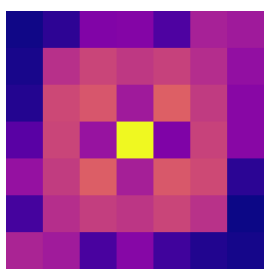
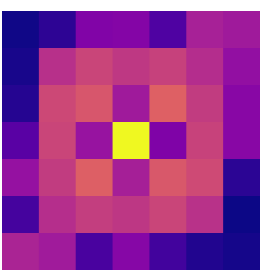
adiag



brand

Initialisation
aléatoire

w_1/w_2



α_1

-0.40 ± 0.001

-59.42 ± 0.06

-58.12 ± 0.10

-58.47 ± 0.07

-60.90 ± 0.05

-39.62 ± 0.66

-61.29 ± 0.07

-58.97 ± 0.12

α_2

-1.29 ± 0.004

63.19 ± 0.07

63.23 ± 0.02

65.01 ± 0.04

65.04 ± 0.01

67.98 ± 0.68

60.72 ± 0.06

63.88 ± 0.02

RMSE₁

$0.39 \pm 1 \times 10^{-3}$

$0.01 \pm 8 \times 10^{-4}$

$0.03 \pm 5 \times 10^{-4}$

$0.004 \pm 7 \times 10^{-4}$

$0.004 \pm 1 \times 10^{-3}$

$0.01 \pm 2 \times 10^{-3}$

$0.03 \pm 8 \times 10^{-3}$

$0.05 \pm 5 \times 10^{-3}$

RMSE₂

$0.39 \pm 1 \times 10^{-3}$

$0.01 \pm 8 \times 10^{-4}$

$0.03 \pm 5 \times 10^{-4}$

$0.004 \pm 8 \times 10^{-4}$

$0.004 \pm 1 \times 10^{-3}$

$0.01 \pm 3 \times 10^{-3}$

$0.03 \pm 8 \times 10^{-3}$

$0.05 \pm 5 \times 10^{-3}$

LOSS

$1.6 \times 10^{-2} \pm 2 \times 10^{-5}$

$2.1 \times 10^{-6} \pm 5 \times 10^{-7}$

$6.2 \times 10^{-6} \pm 7 \times 10^{-7}$

$1.2 \times 10^{-6} \pm 2 \times 10^{-7}$

$1.9 \times 10^{-6} \pm 2 \times 10^{-7}$

$2.3 \times 10^{-6} \pm 1 \times 10^{-6}$

$4.0 \times 10^{-6} \pm 7 \times 10^{-7}$

$1.8 \times 10^{-6} \pm 6 \times 10^{-7}$

EPOCHS

29 ± 7

38 ± 4

33 ± 5

41 ± 6

36 ± 6

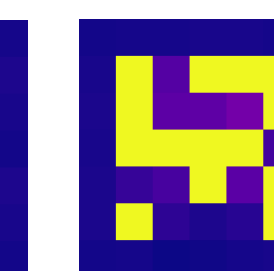
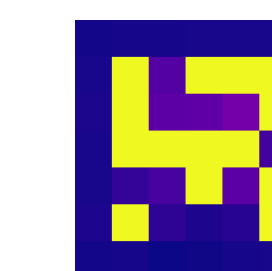
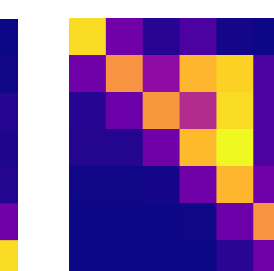
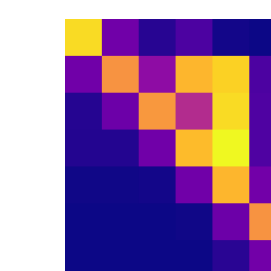
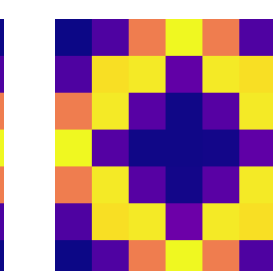
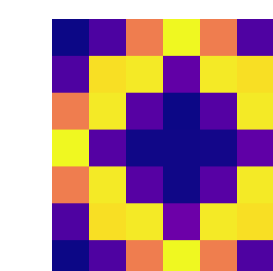
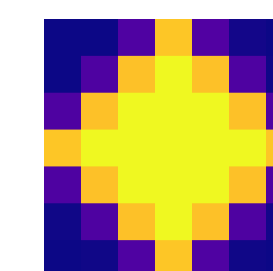
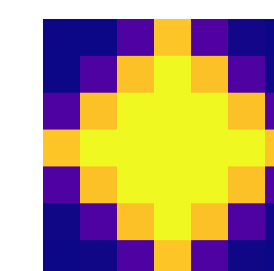
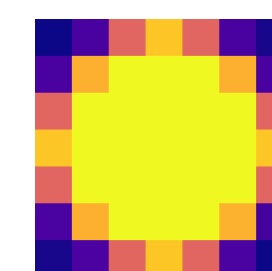
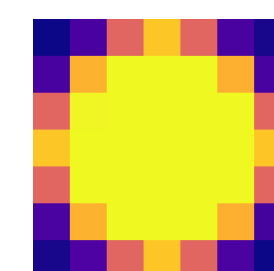
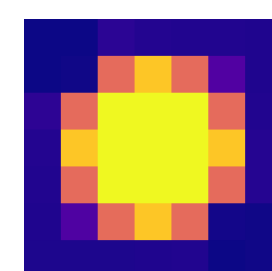
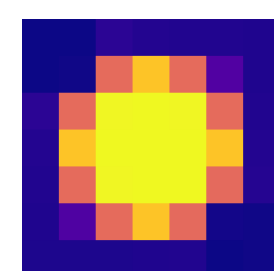
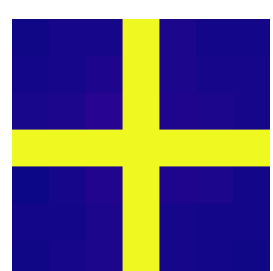
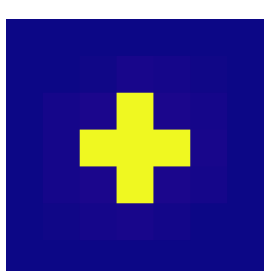
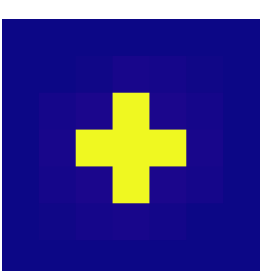
40 ± 6

45 ± 13

39 ± 10

Initialisation
gaussienne

w_1/w_2



α_1

-61.07 ± 0.25

-59.33 ± 0.10

-48.68 ± 21.34

-58.46 ± 0.03

-60.94 ± 0.03

-39.04 ± 0.44

-61.30 ± 0.02

-58.97 ± 0.12

α_2

61.35 ± 0.05

63.21 ± 0.01

52.62 ± 23.75

65.02 ± 0.01

65.05 ± 0.01

68.55 ± 0.46

60.69 ± 0.03

63.90 ± 0.01

RMSE₁

$0.009 \pm 2 \times 10^{-4}$

$0.01 \pm 2 \times 10^{-3}$

$0.11 \pm 2 \times 10^{-1}$

$0.004 \pm 1 \times 10^{-3}$

$0.003 \pm 4 \times 10^{-4}$

$0.01 \pm 2 \times 10^{-3}$

$0.02 \pm 6 \times 10^{-3}$

$0.05 \pm 4 \times 10^{-3}$

RMSE₂

$0.009 \pm 2 \times 10^{-4}$

$0.01 \pm 2 \times 10^{-3}$

$0.11 \pm 2 \times 10^{-1}$

$0.004 \pm 1 \times 10^{-3}$

$0.003 \pm 4 \times 10^{-4}$

$0.01 \pm 2 \times 10^{-3}$

$0.02 \pm 6 \times 10^{-3}$

$0.05 \pm 4 \times 10^{-3}$

LOSS

$8.3 \times 10^{-6} \pm 4 \times 10^{-7}$

$2.1 \times 10^{-6} \pm 6 \times 10^{-7}$

$2.3 \times 10^{-3} \pm 5 \times 10^{-3}$

$1.8 \times 10^{-6} \pm 3 \times 10^{-7}$

$1.5 \times 10^{-6} \pm 5 \times 10^{-7}$

$1.6 \times 10^{-6} \pm 3 \times 10^{-7}$

$3.8 \times 10^{-6} \pm 9 \times 10^{-7}$

$2.1 \times 10^{-6} \pm 6 \times 10^{-7}$

EPOCHS

34 ± 4

34 ± 4

33 ± 7

37 ± 6

42 ± 9

43 ± 5

47 ± 13

33 ± 3