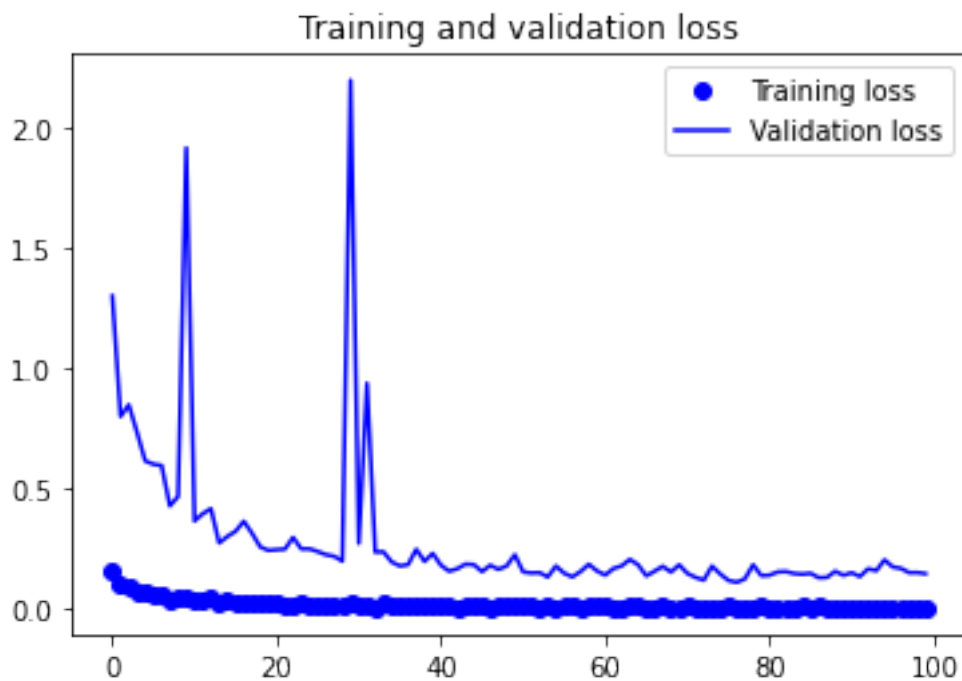# Πείραμα εκπαίδευσης 1

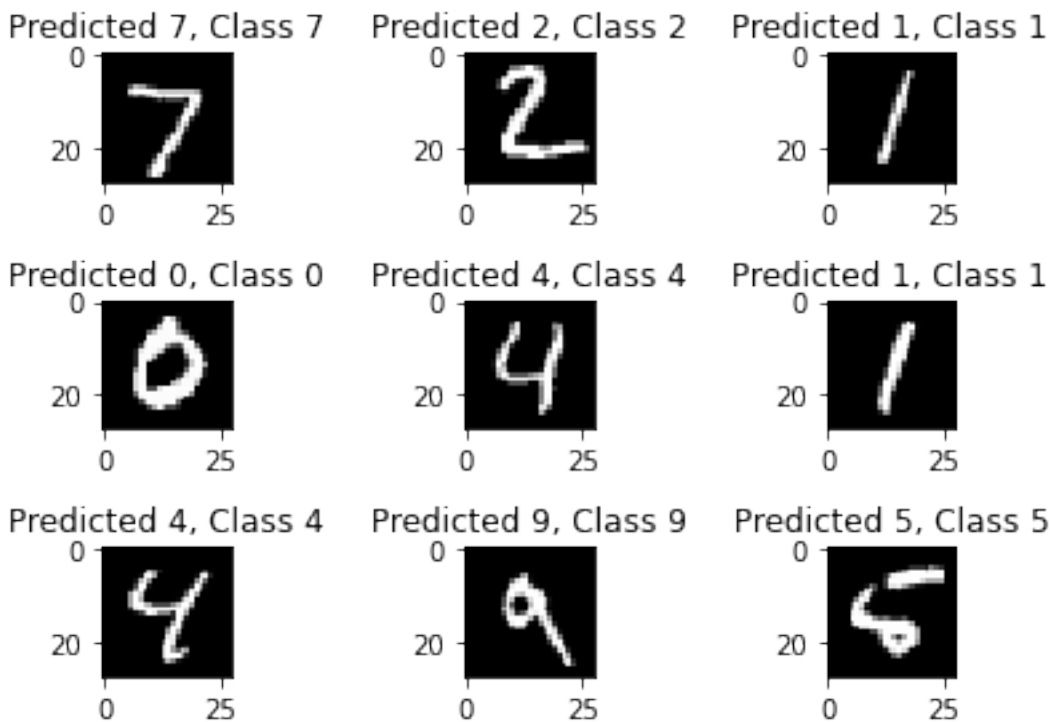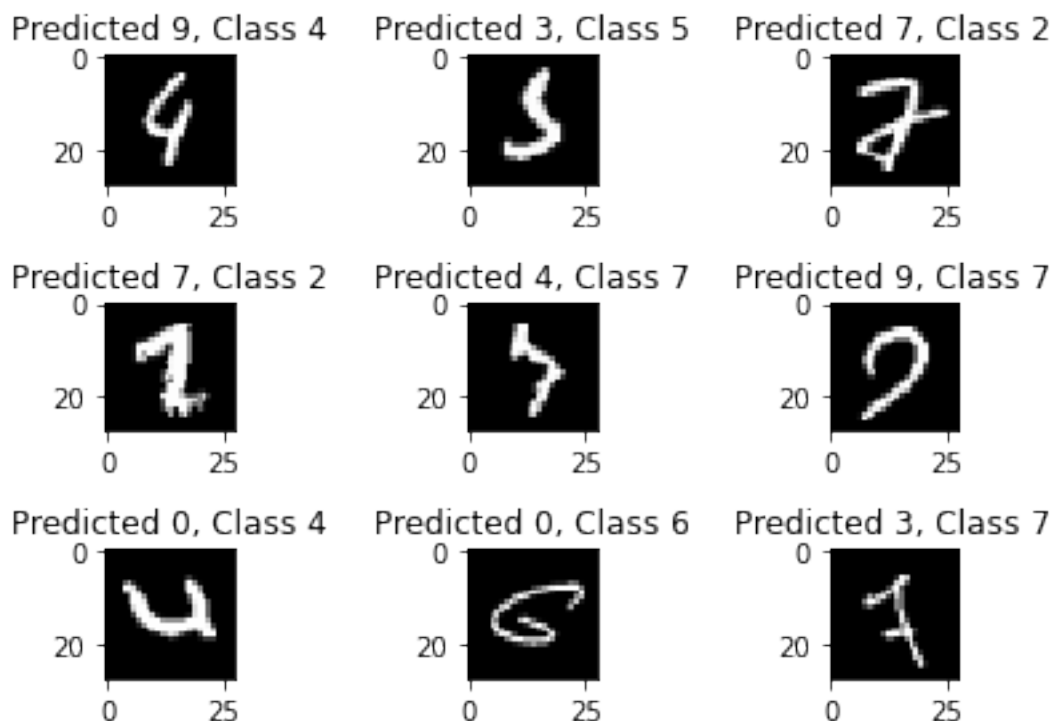| Batch size	64
Epochs	100
Activation Function	Relu,sigmoid(for decoder) ,softmax(for classification)
Loss function	Mean squared error
Optimizer	RMSprop(for autoencoder),Adam(for classification)

For auto-encoder

For classification

Training and validation loss
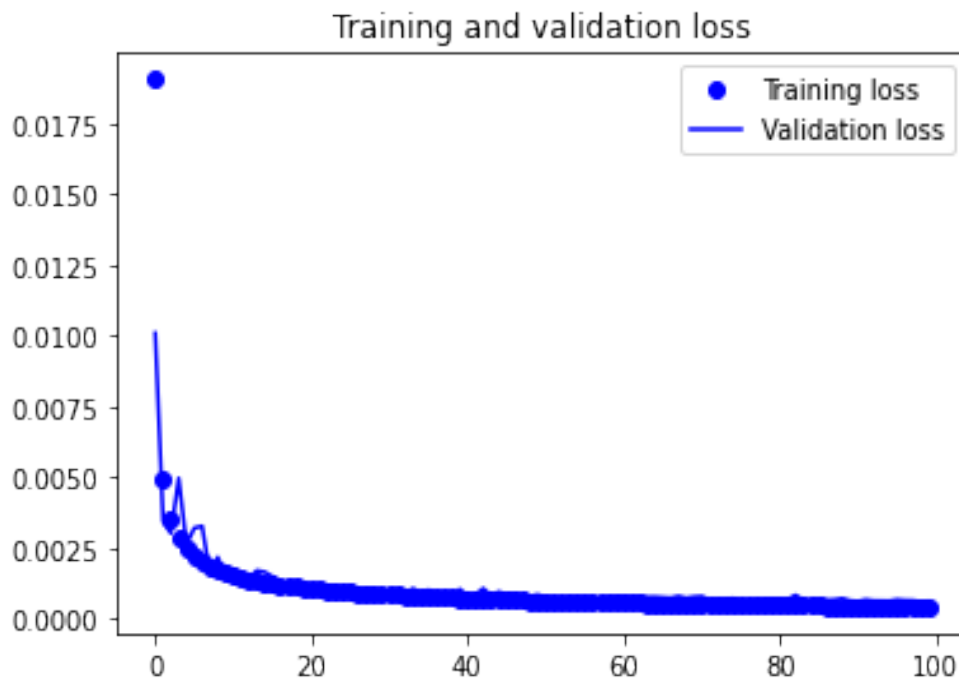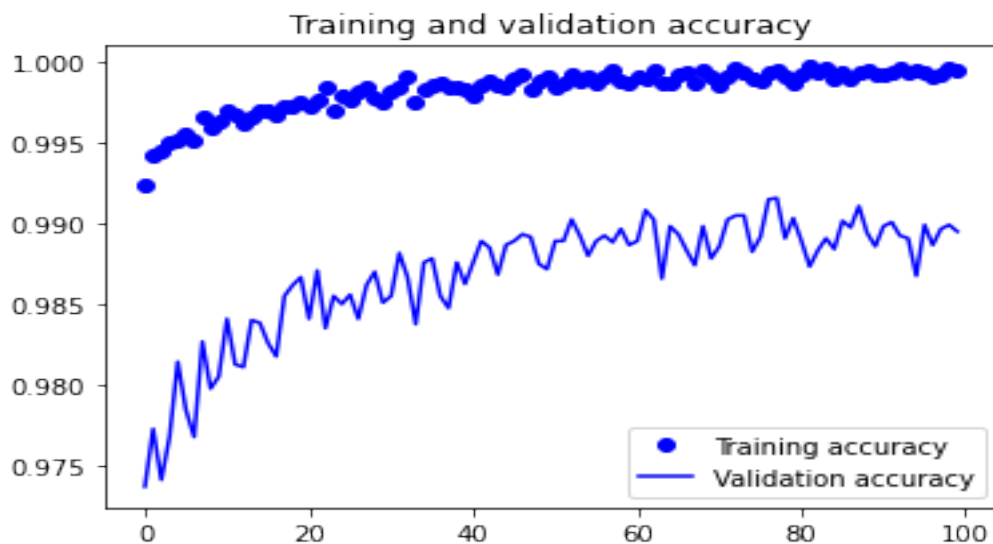
Test loss: 0.10030323266983032
Test accuracy: 0.9909999966621399

Predicted 7, Class 7

Predicted 2, Class 2

Predicted 1, Class 1

Predicted 0, Class 0

Predicted 4, Class 4

Predicted 1, Class 1

Predicted 4, Class 4

Predicted 9, Class 9

Predicted 5, Class 5

	Predicted 9, Class 4	Predicted 3, Class 5	Predicted 7, Class 2
	Predicted 7, Class 2	Predicted 4, Class 7	Predicted 9, Class 7
	Predicted 0, Class 4	Predicted 0, Class 6	Predicted 3, Class 7

	precision	recall	f1-score	support
Class 0	0.99	1.00	0.99	980
Class 1	1.00	1.00	1.00	1135
Class 2	0.99	0.99	0.99	1032
Class 3	0.99	0.99	0.99	1010
Class 4	0.99	0.99	0.99	982
Class 5	1.00	0.99	0.99	892
Class 6	0.99	0.99	0.99	958
Class 7	0.99	0.99	0.99	1028
Class 8	0.99	0.99	0.99	974
Class 9	0.98	0.99	0.99	1009
accuracy			0.99	10000
macro avg	0.99	0.99	0.99	10000
weighted avg	0.99	0.99	0.99	10000

Πείραμα εκπαίδευσης 2
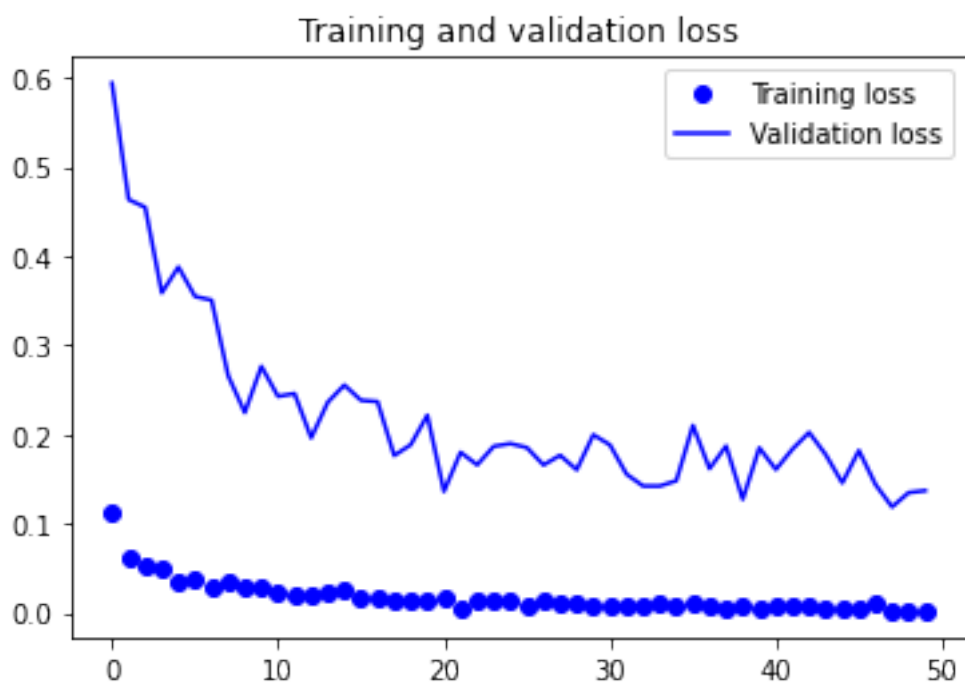
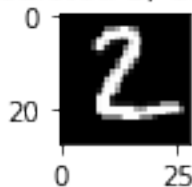| Batch size	64
Epochs	50
Activation Function	Relu,sigmoid(for decoder) ,softmax(for classification)
Loss function	Mean squared error
Optimizer	RMSprop(for autoencoder),Adam(for classification)

For auto-encoder

For classification

Training and validation loss
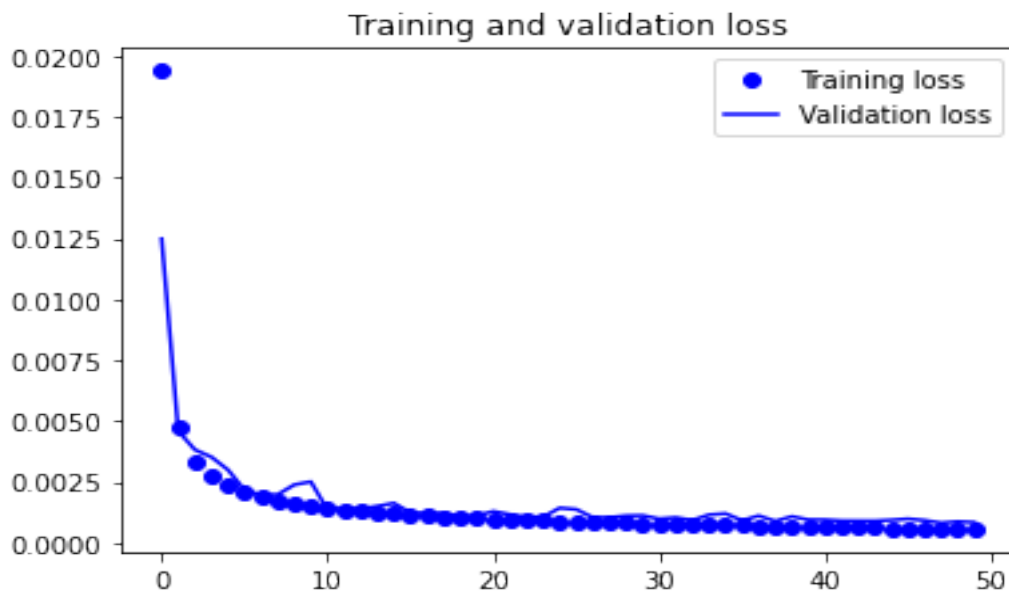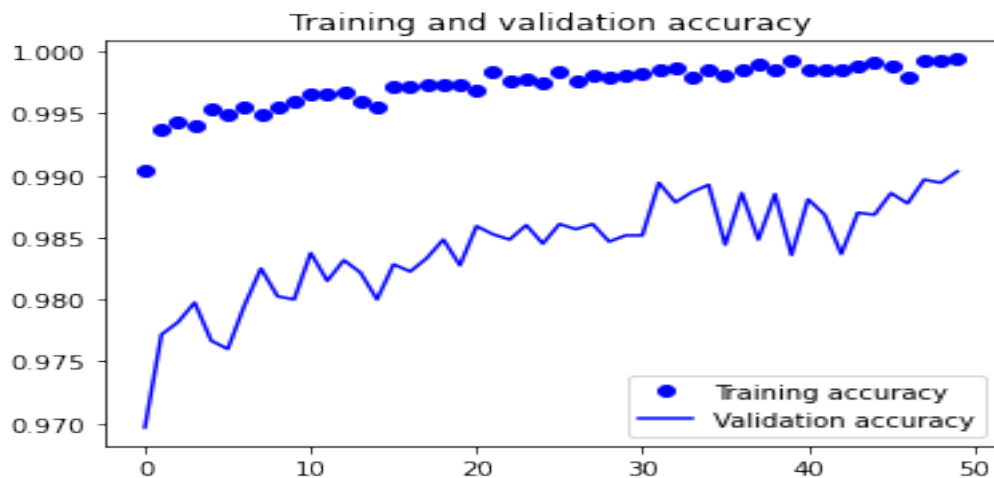
Test loss: 0.11367981880903244
Test accuracy: 0.9894000291824341

	Predicted 6, Class 5	Predicted 6, Class 2	Predicted 5, Class 9
	Predicted 6, Class 4	Predicted 3, Class 5	Predicted 4, Class 9
	Predicted 0, Class 6	Predicted 2, Class 8	Predicted 6, Class 5
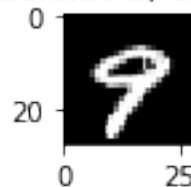
	precision	recall	f1-score	support
Class 0	0.99	0.99	0.99	980
Class 1	1.00	1.00	1.00	1135
Class 2	0.99	0.99	0.99	1032
Class 3	0.99	0.99	0.99	1010
Class 4	0.98	0.99	0.99	982
Class 5	0.99	0.99	0.99	892
Class 6	0.99	0.99	0.99	958
Class 7	0.99	0.99	0.99	1028
Class 8	1.00	0.99	0.99	974
Class 9	0.99	0.97	0.98	1009
accuracy			0.99	10000
macro avg	0.99	0.99	0.99	10000
weighted avg	0.99	0.99	0.99	10000

Πείραμα εκπαίδευσης 3

Batch size	64
Epochs	50
Activation Function	Relu,sigmoid(for decoder) ,softmax(for classification)
Loss function	Mean squared error
Optimizer	RMSprop(for autoencoder),Adam(for classification)

For auto-encoder

For classification

Training and validation loss
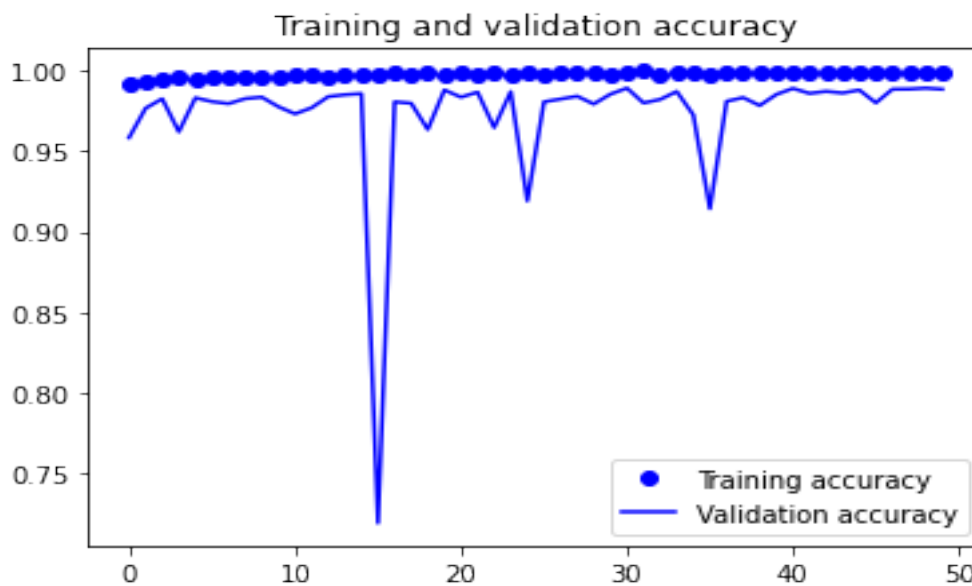
Test loss: 0.11752324551343918
Test accuracy: 0.9876000285148621

Predicted 7, Class 7

Predicted 2, Class 2

Predicted 1, Class 1

Predicted 0, Class 0

Predicted 4, Class 4

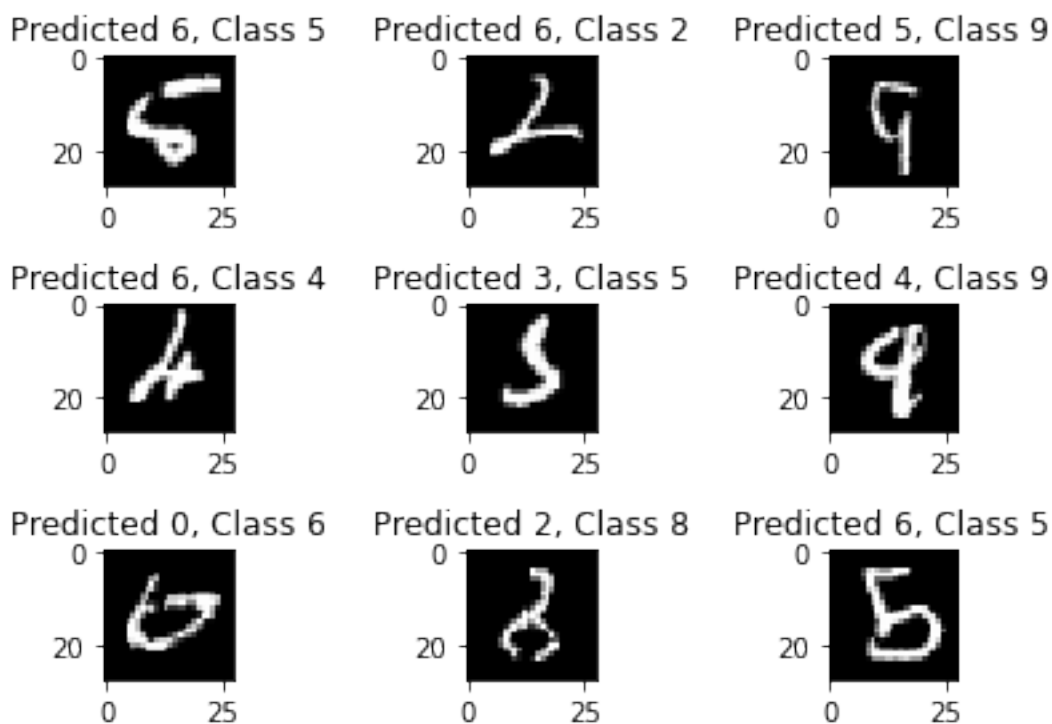Predicted 1, Class 1

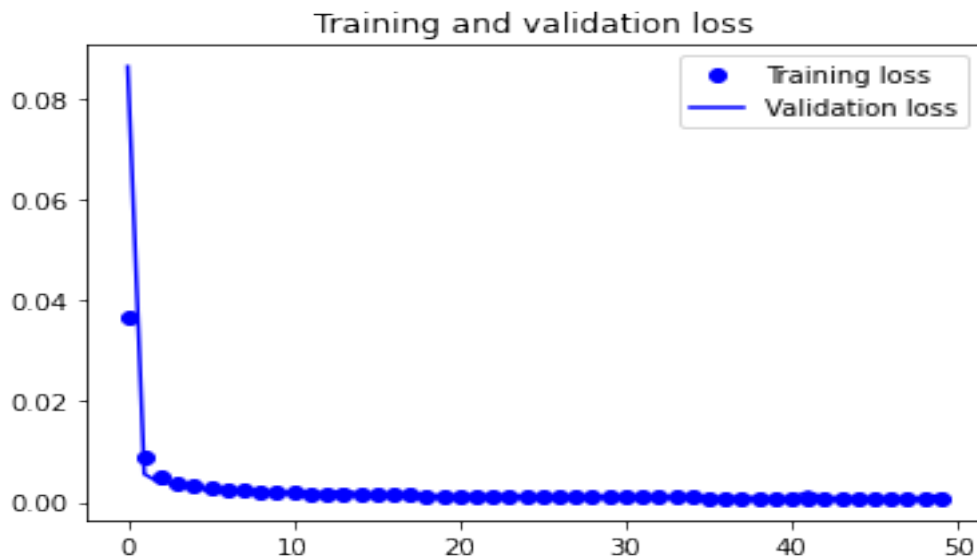Predicted 4, Class 4

Predicted 9, Class 9

Predicted 5, Class 5

Predicted 8, Class 3	Predicted 1, Class 2	Predicted 5, Class 9
Predicted 8, Class 9	Predicted 6, Class 4	Predicted 7, Class 2
Predicted 8, Class 9	Predicted 0, Class 6	Predicted 8, Class 9

	precision	recall	f1-score	support
Class 0	0.99	0.99	0.99	980
Class 1	0.99	1.00	0.99	1135
Class 2	1.00	0.98	0.99	1032
Class 3	0.99	0.99	0.99	1010
Class 4	0.99	0.99	0.99	982
Class 5	0.99	0.98	0.99	892
Class 6	0.99	0.99	0.99	958
Class 7	0.98	0.99	0.99	1028
Class 8	0.97	1.00	0.98	974
Class 9	0.99	0.97	0.98	1009
accuracy			0.99	10000
macro avg	0.99	0.99	0.99	10000

```
weighted avg         0.99        0.99       0.99       10000
```
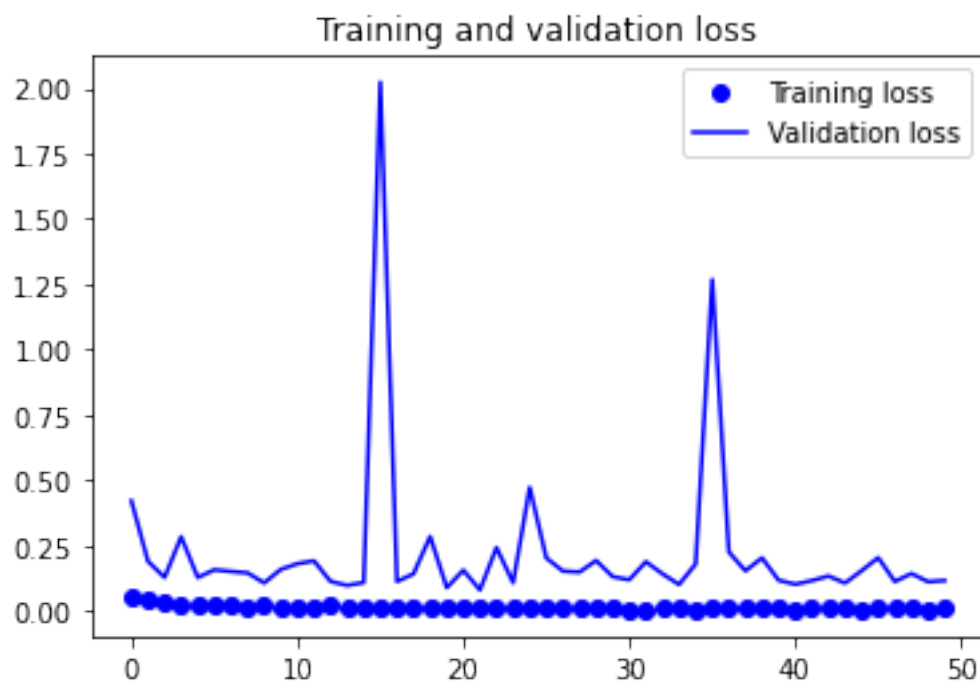
Πείραμα εκπαίδευσης 4

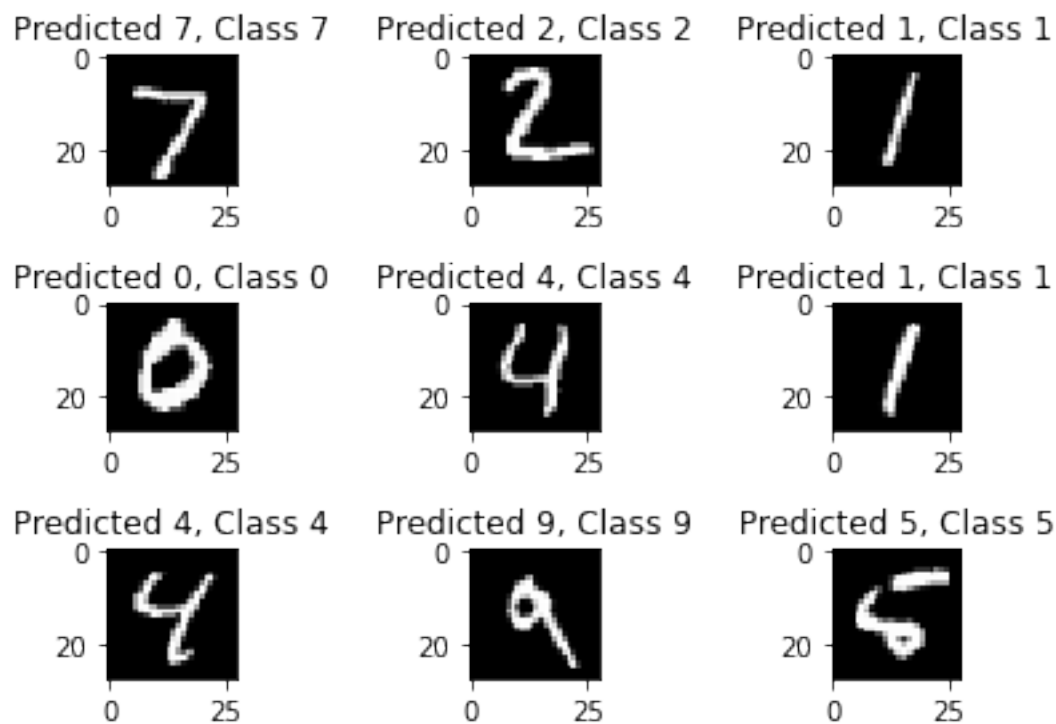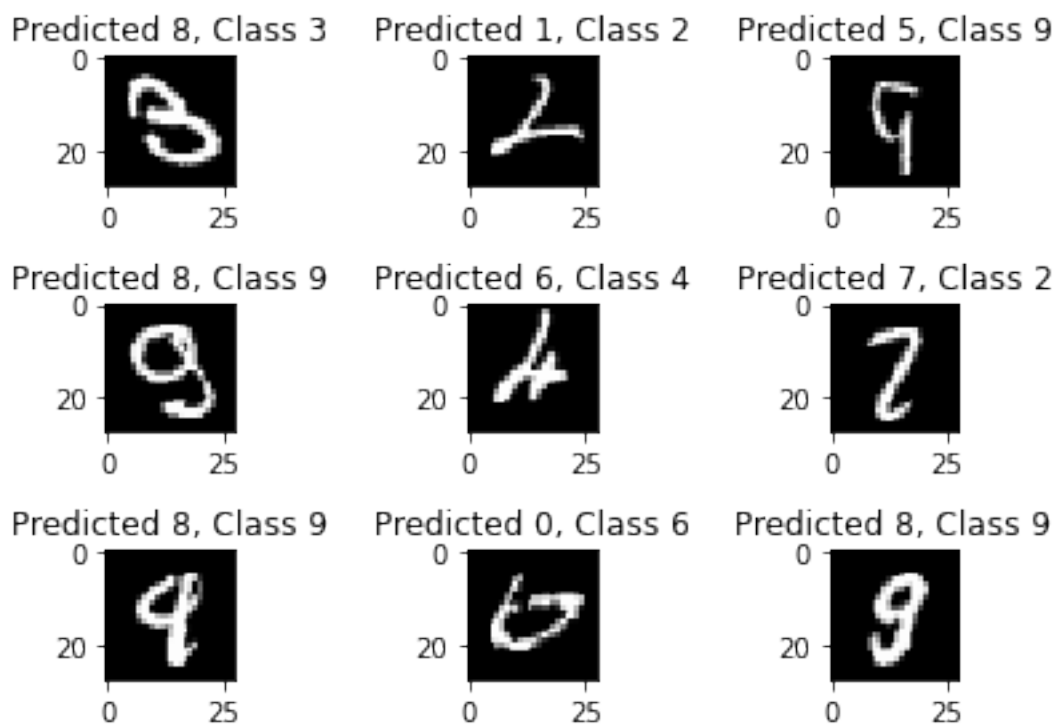| Batch size	128
Epochs	50
Activation Function	softmax,sigmoid(for decoder) ,softmax(for classification)
Loss function	Mean squared error
Optimizer	RMSprop(for autoencoder),Adam(for classification)

For auto-encoder

Training and validation loss

For classification

Training and validation accuracy

Training and validation loss
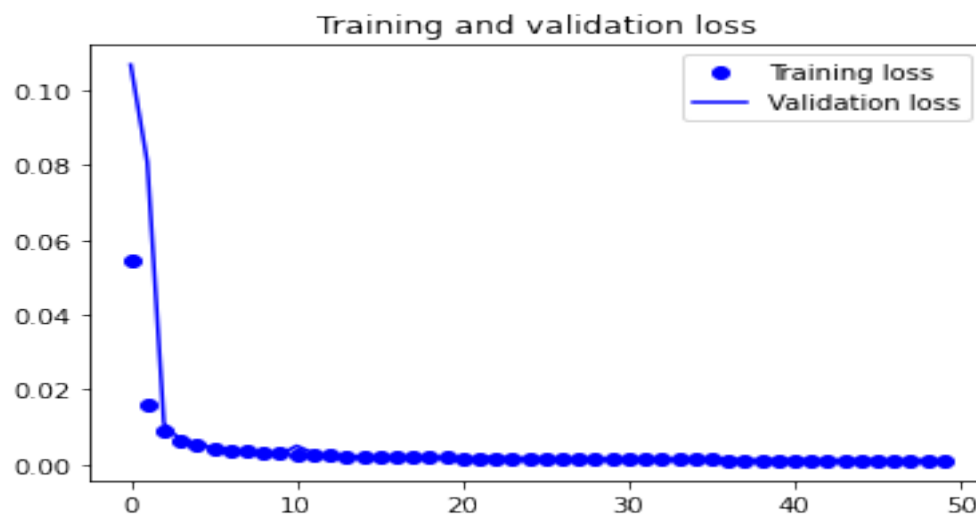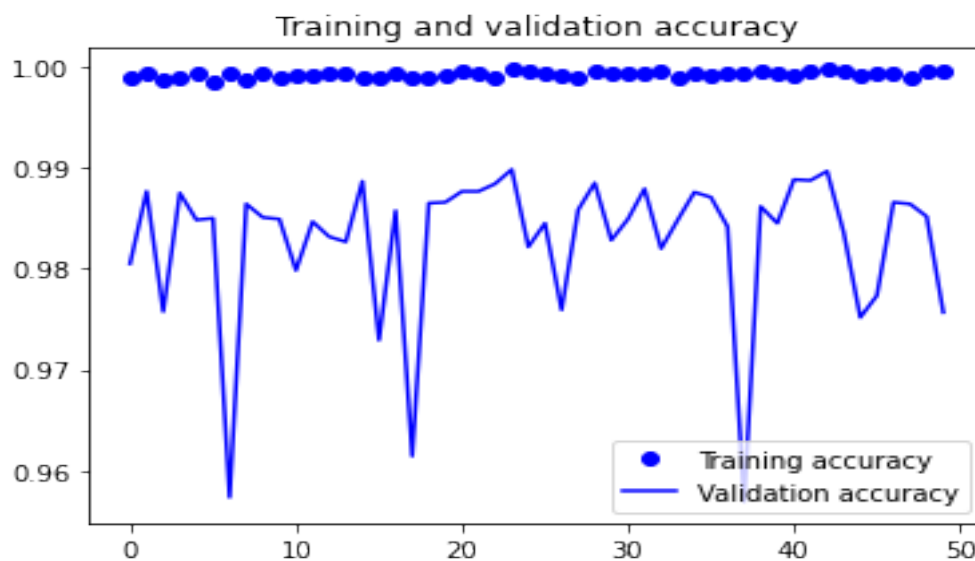
Test loss: 0.2817145884037018
Test accuracy: 0.9775000214576721

	Predicted 8, Class 9	Predicted 2, Class 7	Predicted 4, Class 7
	Predicted 3, Class 5	Predicted 5, Class 6	Predicted 7, Class 9
	Predicted 8, Class 9	Predicted 2, Class 8	Predicted 4, Class 6
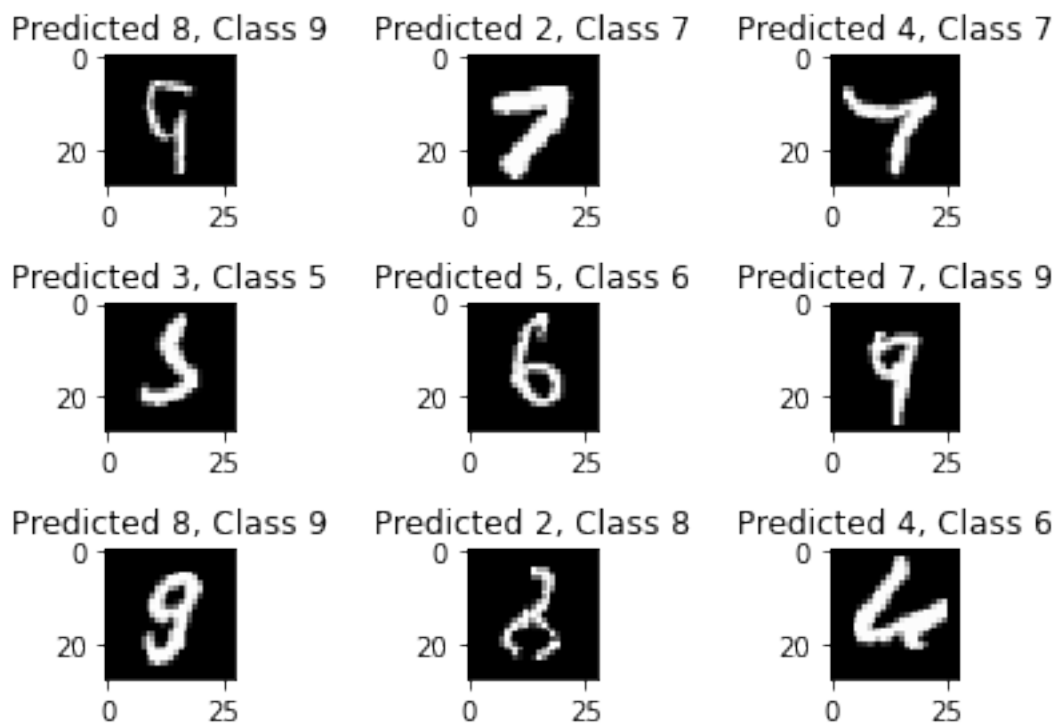
	precision	recall	f1-score	support
Class 0	0.99	0.99	0.99	980
Class 1	1.00	0.96	0.98	1135
Class 2	0.96	1.00	0.98	1032
Class 3	0.99	0.99	0.99	1010
Class 4	0.97	0.98	0.98	982
Class 5	0.96	0.98	0.97	892
Class 6	0.99	0.97	0.98	958
Class 7	0.99	0.96	0.97	1028
Class 8	0.94	0.99	0.97	974
Class 9	0.98	0.96	0.97	1009

```
    accuracy                                      0.98      10000
   macro avg          0.98        0.98           0.98      10000
weighted avg          0.98        0.98           0.98      10000
```
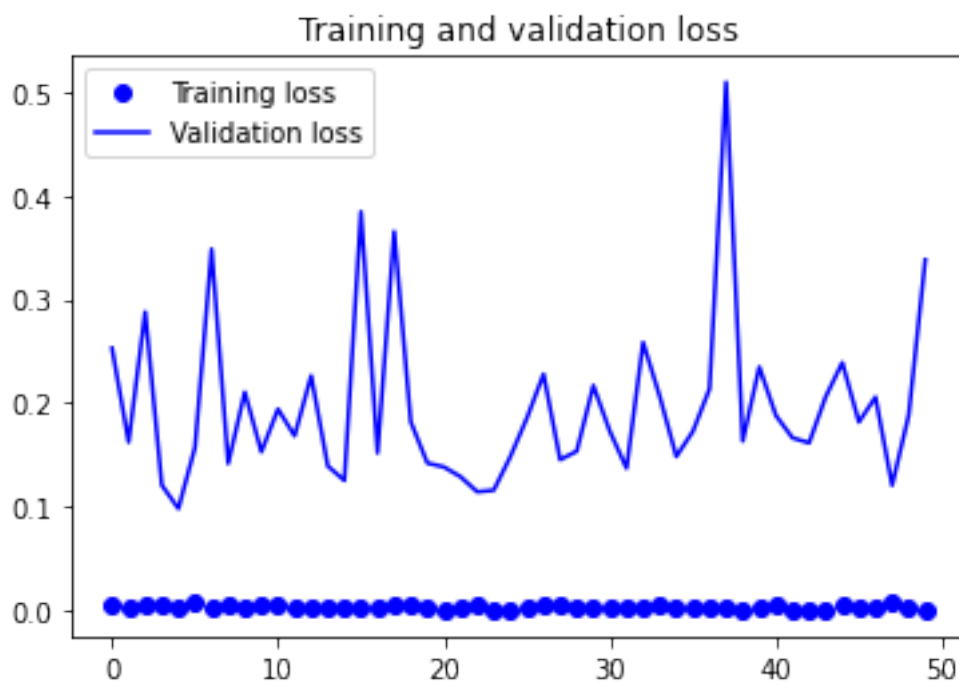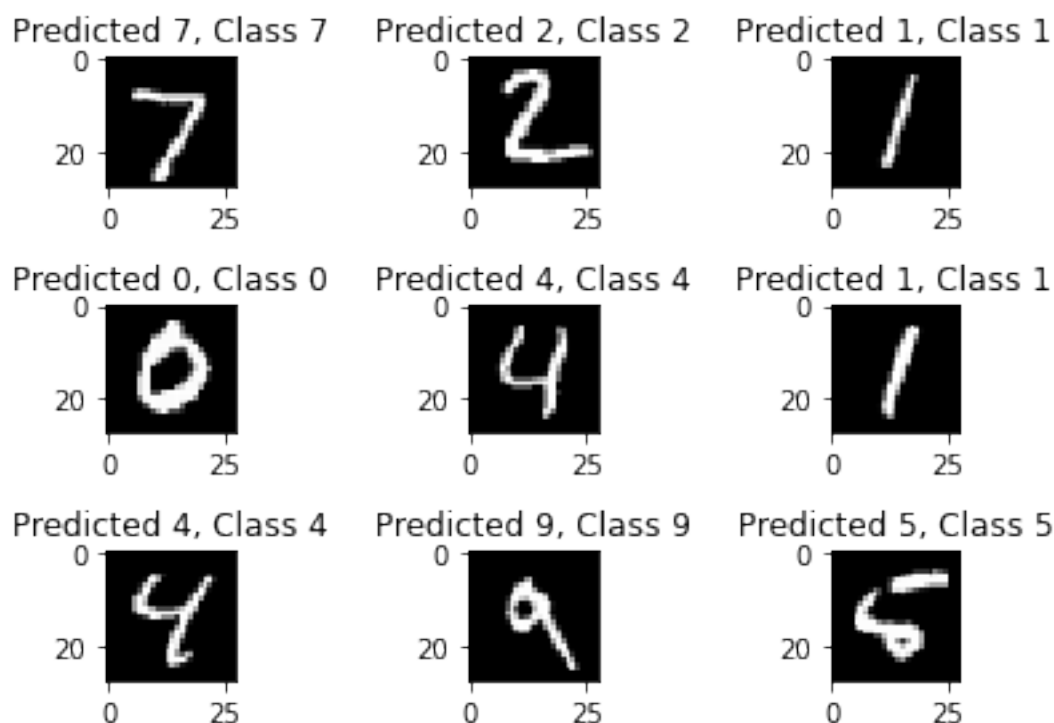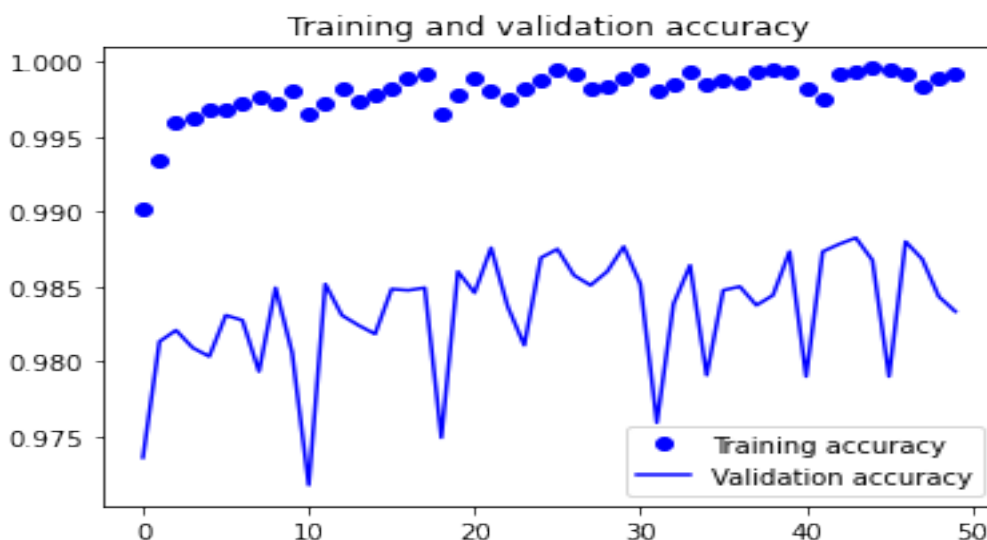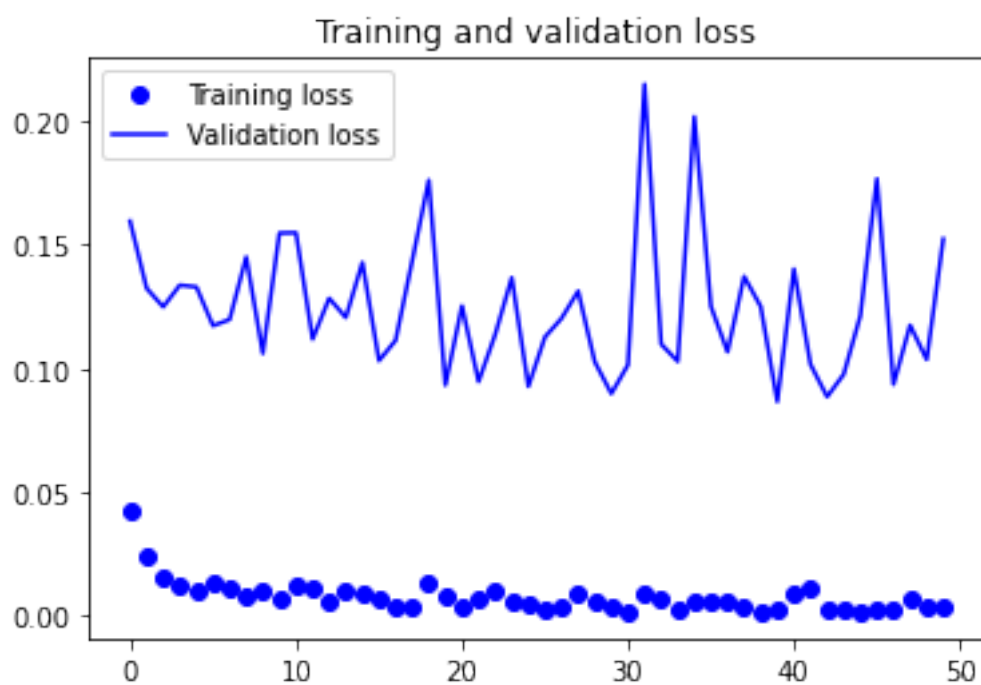
Πείραμα εκπαίδευσης 5

Batch size	256
Epochs	50
Activation Function	softmax,sigmoid(for decoder) ,softmax(for classification)
Loss function	Mean squared error
Optimizer	RMSprop(for autoencoder),Adam(for classification)

For auto-encoder

Training and validation loss

For classification

Training and validation accuracy

Training and validation loss
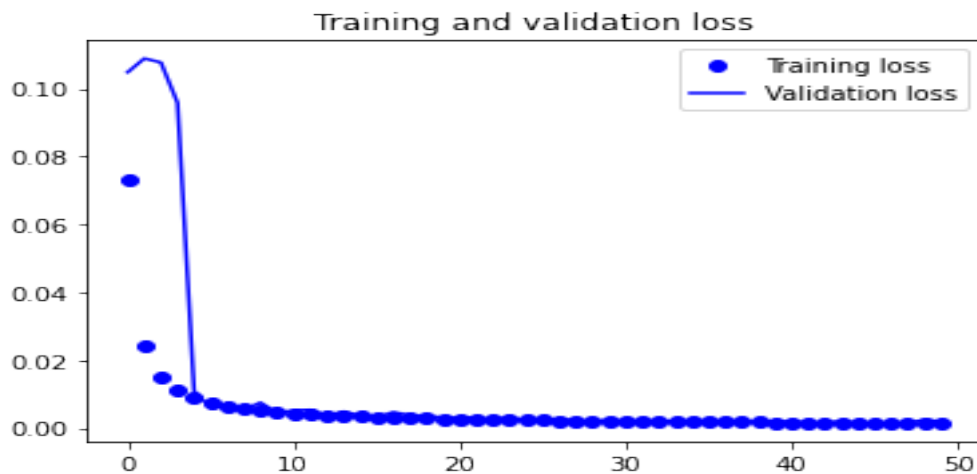
Test loss: 0.12970174849033356
Test accuracy: 0.9860000014305115

Predicted 7, Class 7	Predicted 2, Class 2	Predicted 1, Class 1
Predicted 0, Class 0	Predicted 4, Class 4	Predicted 1, Class 1
Predicted 4, Class 4	Predicted 9, Class 9	Predicted 5, Class 5
Predicted 4, Class 1	Predicted 8, Class 9	Predicted 7, Class 2
Predicted 3, Class 5	Predicted 8, Class 9	Predicted 2, Class 8
Predicted 2, Class 8	Predicted 3, Class 8	Predicted 8, Class 1

	precision	recall	f1-score	support
Class 0	1.00	0.98	0.99	980
Class 1	1.00	0.98	0.99	1135
Class 2	0.97	0.99	0.98	1032
Class 3	0.98	1.00	0.99	1010
Class 4	0.99	0.99	0.99	982
Class 5	0.98	0.99	0.99	892
Class 6	0.98	1.00	0.99	958
Class 7	0.99	0.99	0.99	1028
Class 8	0.99	0.98	0.98	974
Class 9	0.99	0.97	0.98	1009
accuracy			0.99	10000
macro avg	0.99	0.99	0.99	10000
weighted avg	0.99	0.99	0.99	10000

Πείραμα εκπαίδευσης 6

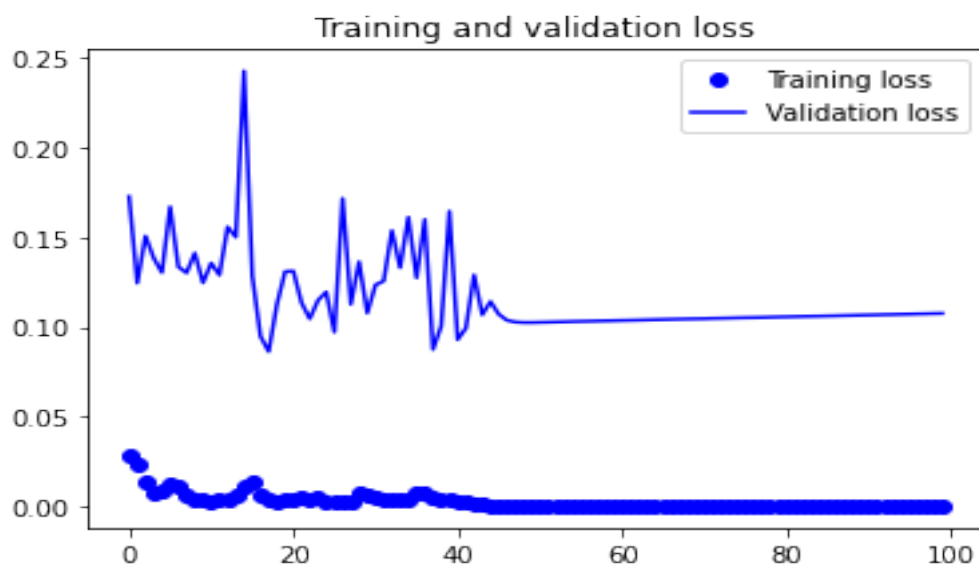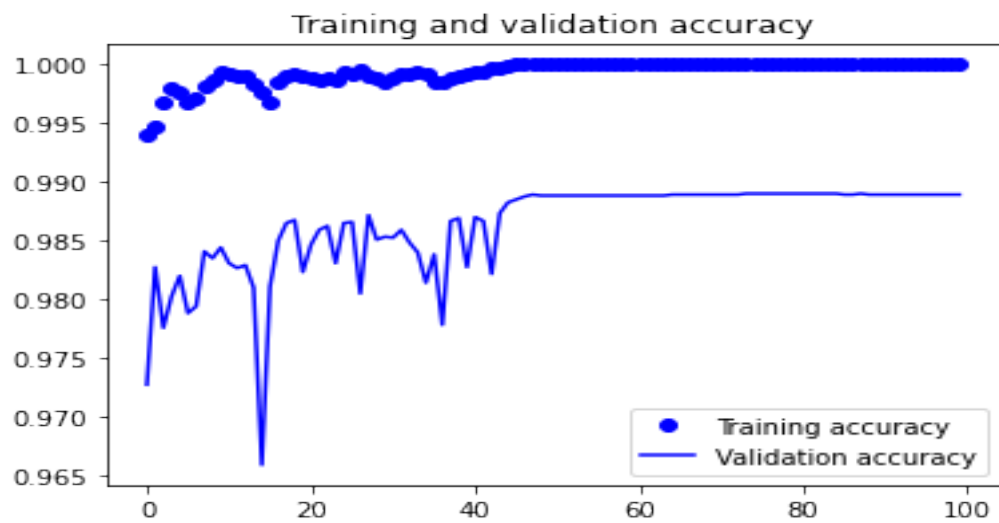| Batch size	512
Epochs	100
Activation Function	softmax,sigmoid(for decoder) ,softmax(for classification)
Loss function	Mean squared error
Optimizer	RMSprop(for autoencoder),Adam(for classification)

For auto-encoder

For classification

Training and validation accuracy

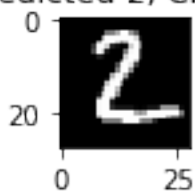Training and validation loss
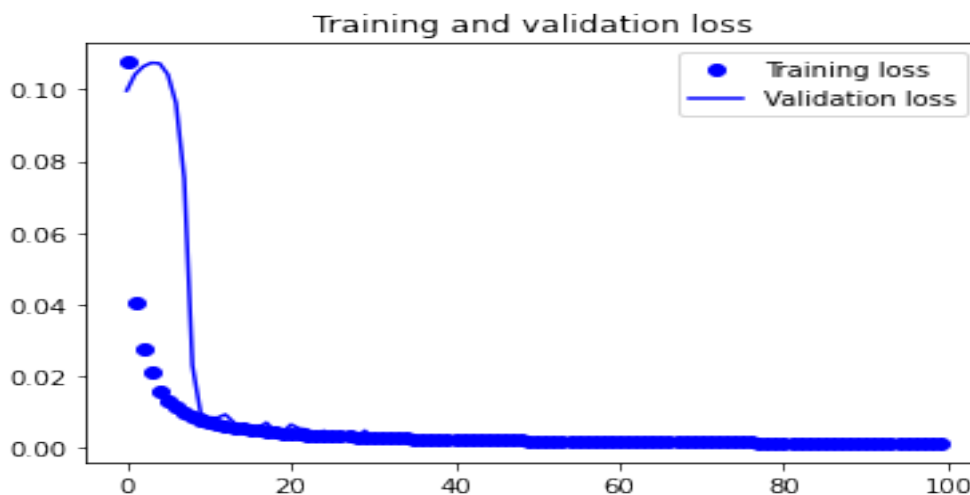
Test loss: 0.10453889518976212
Test accuracy: 0.9890999794006348
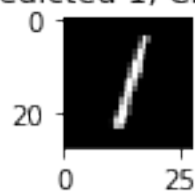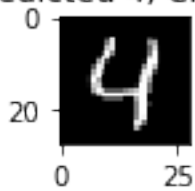
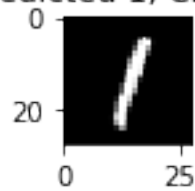Predicted 7, Class 7   Predicted 2, Class 2   Predicted 1, Class 1
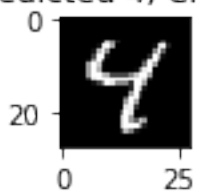
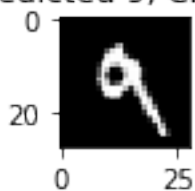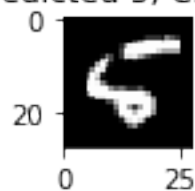Predicted 0, Class 0   Predicted 4, Class 4   Predicted 1, Class 1
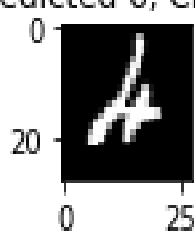
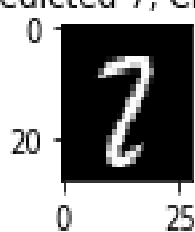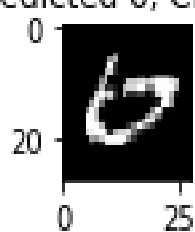Predicted 4, Class 4   Predicted 9, Class 9   Predicted 5, Class 5
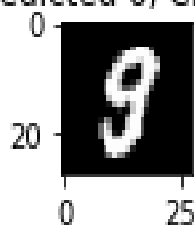
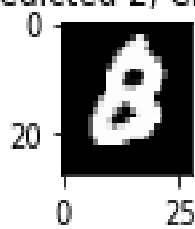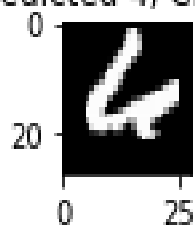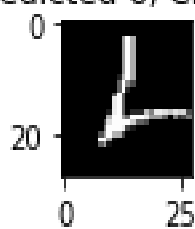Predicted 6, Class 4   Predicted 7, Class 2   Predicted 0, Class 6
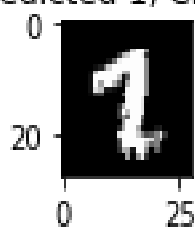
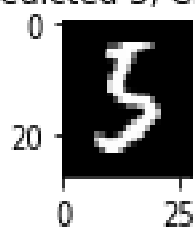Predicted 0, Class 9   Predicted 2, Class 8   Predicted 4, Class 6

Predicted 6, Class 2   Predicted 1, Class 2   Predicted 3, Class 5

	precision	recall	f1-score	support
Class 0	0.99	0.99	0.99	980
Class 1	1.00	0.99	1.00	1135
Class 2	0.99	0.99	0.99	1032
Class 3	0.98	0.99	0.99	1010
Class 4	0.99	0.99	0.99	982
Class 5	0.99	0.99	0.99	892
Class 6	0.99	0.99	0.99	958
Class 7	0.99	0.99	0.99	1028
Class 8	0.99	0.98	0.99	974
Class 9	0.99	0.98	0.99	1009
accuracy			0.99	10000
macro avg	0.99	0.99	0.99	10000
weighted avg	0.99	0.99	0.99	10000