**Theory Questions:**

1. Hur är AI, Maskininlärning och Deep Learning relaterat?

Ans: AI is about creating models that perform different tasks like humans. Machine Learning is a subset of AI, where these models learn different patterns from data and give solutions. Deep Learning is a subset of Machine Learning, which uses large neural networks to learn patterns from data.

1. Hur är Tensorflow och Keras relaterat?

Ans: Tensorflow is the platform, and Keras is a high level API used for solving machine learning and deep learning problems.

1. Vad är en parameter? Vad är en hyperparameter?

Ans: Parameters are automatically adjusted by model during training to best fit the data, while hyperparameters are set by user before training.

1. När man skall göra modellval och modellutvärdering kan man använda tränings-, validerings- och testdataset. Förklara hur de olika delarna kan användas?

Ans: Training data is used to train the model and usually makes up the largest part of the data. Validation data is used to tune and validate the model during training. Finally, test data, which is new to the model, is used to evaluate the final model’s performance.

1. Förklara vad nedanstående kod

A screen shot of a computer program

AI-generated content may be incorrect.

Ans The code builds a neural network with 4 layers, using ReLU activation in the hidden layers and sigmoid activation in the output layer. The model is compiled with the Adam optimizer and binary cross-entropy loss function. The data is split into 80% training and 20% validation. The model trains for up to 100 epochs but uses early stopping with a patience of 5, which stops training if the validation loss does not improve for 5 consecutive epochs.

1. Vad är syftet med att regularisera en modell?

Ans We regularize a model to reduce overfitting. Techniques like dropout and early stopping help prevent the model from focusing on noise or memorizing unnecessary details.

1. ”Dropout” är en regulariseringsteknik, vad är det för något?

Ans Dropout is a regularization technique that randomly removes some neurons during training to reduce overfitting.

1. ”Early stopping” är en regulariseringsteknik, vad är det för något?

Ans This technique stops training when a chosen metric stops improving. By setting a patience value (number of epochs), training will stop if the metric does not improve for that many epochs.

1. Din kollega frågar dig vilken typ av neuralt nätverk som är populärt för bildanalys, vad svarar du?

Ans Conventional neural networks are popular for image analysis because they identify all the features automatically with out manual work.

1. Förklara översiktligt hur ett ”Convolutional Neural Network” fungerar?

Ans First, the CNN identifies low-level features like edges and textures, then combines them layer by layer to learn higher-level features such as shapes and objects.

For example, if we take any animal as an example, first CNN identifies very small features of that animals and combine them layer by layer and learn higher features of that animal.

1. Vad gör nedanstående kod?

model.save("model\_file.keras")

my\_model = load\_model("model\_file.keras")?

Ans The code saves the trained model to a file named "model\_file.keras" and then loads the model from that file.

1. Deep Learning modeller kan ta lång tid att träna, då kan GPU via t.ex. Google Colab skynda på träningen avsevärt. Skriv mycket kortfattat vad CPU och GPU är?

Ans CPU: Central Processing Unit, the main processor in a computer used to perform general tasks.  
GPU: Graphics Processing Unit, a processor designed to handle many tasks simultaneously, making it faster for training deep learning models.

**Självutvärdering:**

1. Vad har varit roligast i kunskapskontrollen?

Ans : Working with chatbot was the best.

1. Vilket betyg anser du att du ska ha och varför?

Ans : G, I am still working on integrating the Västtrafik API into this chatbot to provide real-time bus timings for all Västtrafik buses.

1. Vad har varit mest utmanande i arbetet och hur har du hanterat det?

Ans: Same working with chatbot, it was quite difficult in the starting but learning step by step and finally got the solution.