**Key Points: TensorFlow Model Saving & Loading**

(*For Interview & TensorFlow Professional Certification*)

**🔹 Why Save & Load Models?**

* Avoids retraining from scratch.
* Enables model sharing & deployment.
* Supports resuming training after interruptions.

**🔹 Methods to Save Models in TensorFlow**

1️⃣ **Save only Weights** → .save\_weights()

* Stores only the model’s parameters.
* Requires the same model architecture for loading.
* Example:

python

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model.save\_weights("model\_weights.h5")

model.load\_weights("model\_weights.h5")

2️⃣ **Save the Entire Model** → .save()

* Includes model architecture, weights, optimizer state.
* Can be loaded independently.
* Example:

python

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model.save("full\_model.keras")

new\_model = tf.keras.models.load\_model("full\_model.keras")

3️⃣ **Checkpointing During Training** → ModelCheckpoint()

* Saves model after each epoch (to resume training).
* Example:

python

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cp\_callback = tf.keras.callbacks.ModelCheckpoint("cp.weights.h5", save\_weights\_only=True)

model.fit(train\_data, train\_labels, epochs=10, callbacks=[cp\_callback])

**🔹 Model Formats & Use Cases**

| **Format** | **Use Case** |
| --- | --- |
| **HDF5 (.h5)** | Compact format, easy to share. |
| **SavedModel** | Best for TensorFlow Serving & deployment. |
| **Keras (.keras)** | Recommended for Keras models. |

**🔹 Common Interview Questions & Answers**

1️⃣ **Why is model saving important?**  
→ Avoids retraining, enables deployment & sharing.  
2️⃣ **What is the difference between saving weights & saving the full model?**  
→ Weights-only requires the same architecture, while full model saves everything.  
3️⃣ **How do you resume training from a checkpoint?**  
→ Load weights using .load\_weights() before calling .fit().  
4️⃣ **What happens when you reload a saved model?**  
→ It retains architecture, weights, and optimizer settings.  
5️⃣ **Which format is best for deployment?**  
→ **SavedModel** is best for TensorFlow Serving, **HDF5** is best for sharing.