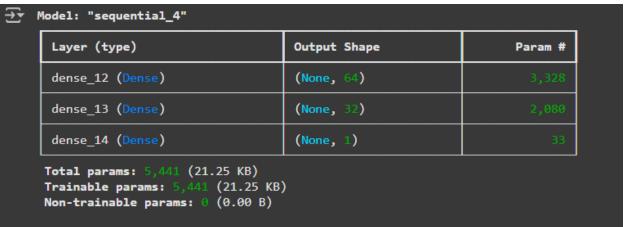Initial Model (Given by Tr)
- In the initial model, it's simple and consisted 3 layers in total (input, hidden and output) . An input layer has dense layer with 32 neurons. A hidden layber has 16 neurons. The final output layer has one neuron.
- The total number of parameters in this simple model is 2209.
- To improve the model, the inital one is modified by adding more layers and adding number of neurons in the initial one.

Model: "sequential_1"

Layer (type)	Output Shape	Param #
dense_3 (Dense)	(None, 32)	1,664
dense_4 (Dense)	(None, 16)	528
dense_5 (Dense)	(None, 1)	17

```
Total params: 6,629 (25.90 KB)
Trainable params: 2,209 (8.63 KB)
Non-trainable params: 0 (0.00 B)
Optimizer params: 4,420 (17.27 KB)
```

Improved Model
- In the modified model, there are also there layers in total. Input layer has 64 neurons. Hidden layer has 32 neurons. The output layer has one neuron.
- Right now, total number of parameters in modified model is 5441.

Model: "sequential_4"

Layer (type)	Output Shape	Param #
dense_12 (Dense)	(None, 64)	3,328
dense_13 (Dense)	(None, 32)	2,080
dense_14 (Dense)	(None, 1)	33

```
Total params: 5,441 (21.25 KB)
Trainable params: 5,441 (21.25 KB)
Non-trainable params: 0 (0.00 B)
```

In below, we can see that root mean suqared error, mean absolute error and mean absolute percentage error are reduced in modified model compared to initial model. Even though adding more layers and neurons cannot gurantee the imporvment of model, in this homework project we can see that adding more neruons make the model imporve.

Initial model

```
,Train,Test
Root Mean Squared Error,91015.73,91805.0
Mean Aboslute Error,68958.49,69076.66
Mean Aboslute Percentage Error,11.5,11.5
R2 score,0.81,0.8
```

Improved model

```
1    ,Train,Test
2    Root Mean Squared Error,87039.33,87784.54
3    Mean Aboslute Error,65559.6,65709.48
4    Mean Aboslute Percentage Error,10.79,10.8
5    R2 score,0.82,0.82
6
```