**To complete this assignment, create a Jupyter notebook containing your solutions to the following tasks:**

1. **Please specify whether the following arguments are true or false:**
   * **ANNs are the only neural network architecture that perform reasonably well in real-world tasks.**

**False: we also have the convolutional and recurrent**

* + **The sample size of the training data is a hyperparameter of an ANN model.**

**False**

* + **In the checkpoint, we covered two hyperparameters of ANNs: number of layers and number of neurons in the layers. But, there are also other hyperparameters of the model.**

**True: Other hyperparameters: others are activation function of the neuron and the optimizer**

* + **Output layer of an ANN can only contain one neuron.**

**False; if it’s a regression problem then the output may contain one neuron. If it’s a classification problem, the number of neurons equals the number of classes.**

1. **We have data with 10 features and we designed an ANN to be trained on this data. If we have three layers with 512 neurons each in this ANN, how many parameters do we need to estimate?**

**First layer: 10 weights, 1 bias: 11 parameters total :512neurons 512x11=5,632 parameters**

**Second layer: 512 weights, 1 bias: 513 parameters total: 512 neurons 512x513=262,656 parameters**

**Third layer: 512 weights, 1 bias: 513 parameters total: 512 neurons 512x513=262,656 parameters**

**Total 5,632+262,656+262,656=530,944 parameters**

1. **We have data with 100 features and we designed an ANN to be trained on this data. If in this ANN, we have three layers with 512, 256 and 10 neurons, how many parameters do we need to estimate?**

**First layer: 100 weights, 1 bias: 101 parameters total :512neurons 512x101=51,712 parameters**

**Second layer: 512 weights, 1 bias: 513 parameters total :256neurons 513x256=131,328 parameters**

**Third layer: 256 weights, 1 bias: 257 parameters total :10neurons 257x10=2,570 parameters**

**Total: 185610**

**Submit your work below, and plan on discussing it with your mentor. You can also take a look at** this [**example solution**](https://drive.google.com/file/d/1heLGDGSfhK5ibDCt26l6VeH-iXHXF426/view?usp=sharing).