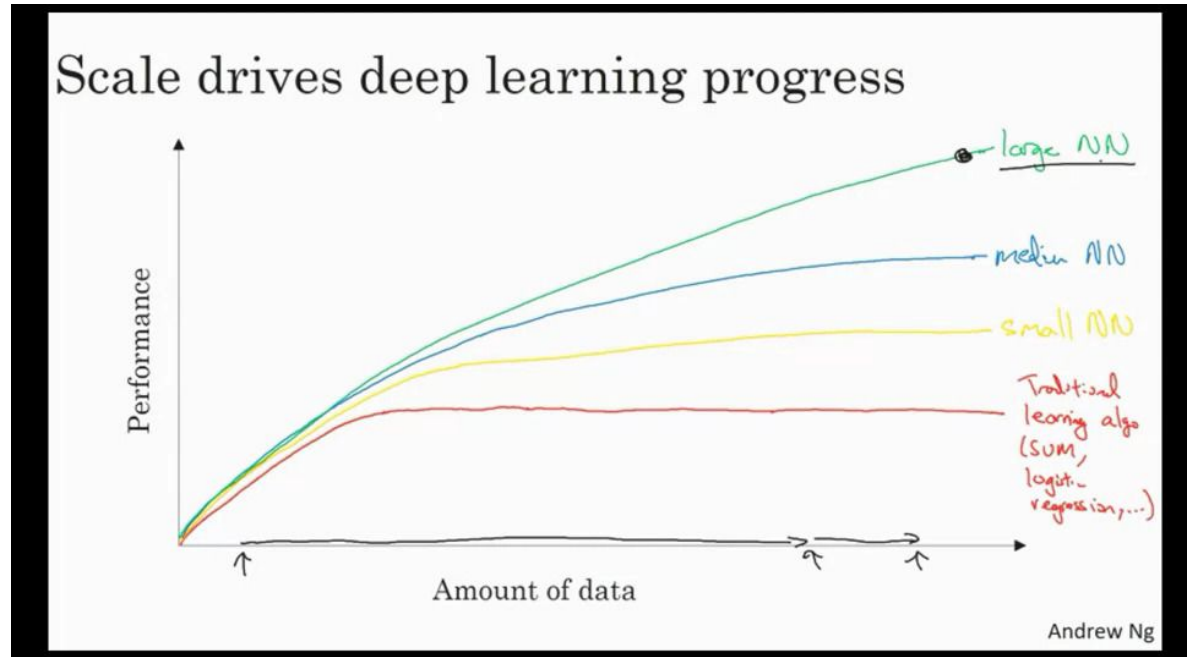
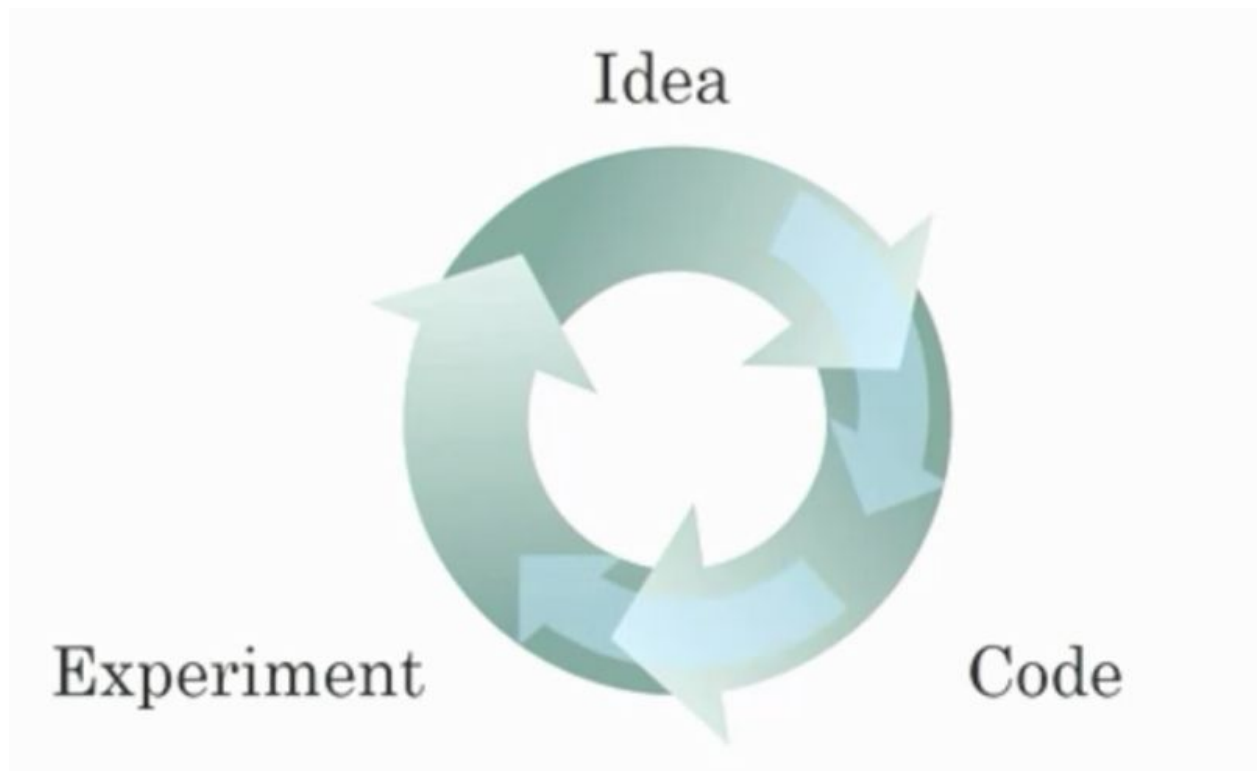


Respecting the coursera policies, this work will only be an explainer for the Quiz questions. No answers will be given out. But any sincere learner would be able to pick the right answer after the learning.

1. What does the analogy “AI is the new electricity” refer to?
 - a. Sundar Pichai of Google said that AI will bring a [more profound change than fire and Electricity](#). Andrew Ng was referring to the similar transformatory effect of AI on modern life and industry. To add to that, if AI is the new electricity; then data is the new oil that fuels this power.
2. Why is Deep Learning taking off recently?
 - a. Firstly, the computational power was increased tremendously in the last few decades. We are now stepping into the era of Quantum Computing, that will further increase our ability to use deep learning and train complex neural networks.
 - b. Secondly, the applications of AI in computer vision, advanced Natural Language processing etc., deal with huge data. Traditional Machine Learning will not help us in such applications.
 - c. Lastly, we generated immense levels of data in the last few decades. As Andrew Ng drew a graph in the class, this immense data is only beneficial when we use Neural Networks. Traditional Machine Learning models are unable to make best use of this immense data.

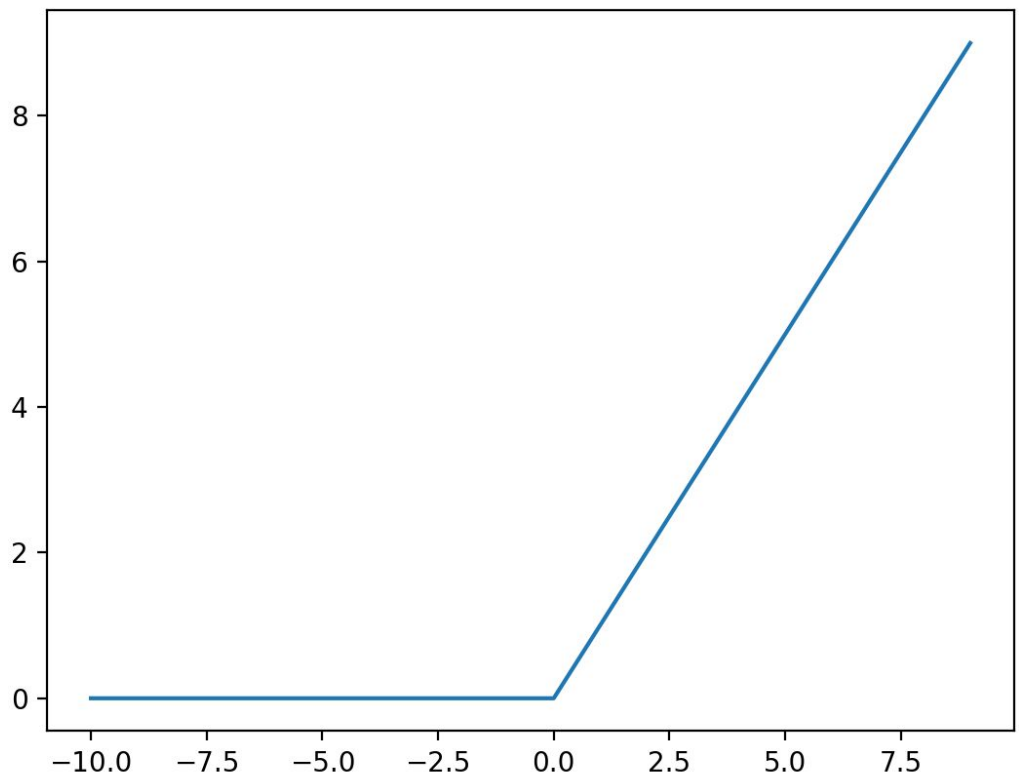


3. Recall this diagram of iterating over different ML ideas.



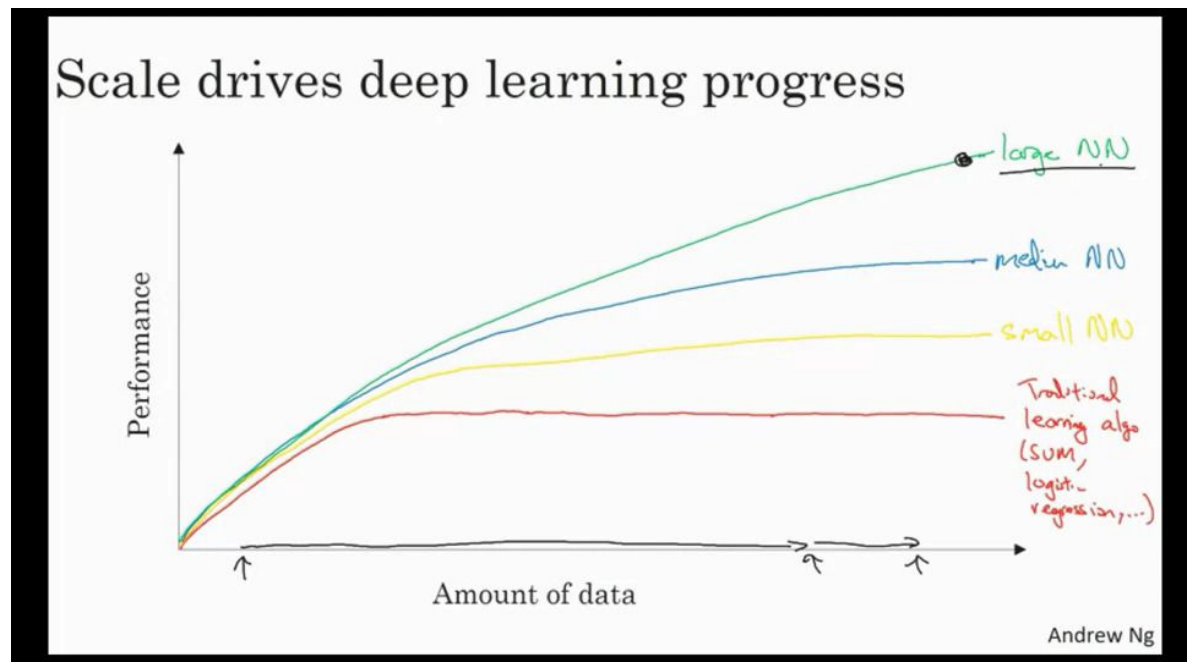
- a. Extending the explanation from the previous question, the increased computational power gave sufficient bandwidth for data-scientists to ‘experiment’ an idea with various machine learning/deep learning techniques.
 - b. Moreover, the improvements in deep learning algorithms like ReLU function expedited the time taken to run the code. This also increased data scientist’s bandwidth to experiment and try out more ideas.
4. When an experienced deep learning engineer works on a new problem, they can usually use insight from previous problems to train a good model on the first try, without needing to iterate multiple times through different models. True/False?
- a. Data Science is always an iterative process. It is different from algebra where we can accurately solve the equation to find out weight-coefficients. Experience helps in avoiding mistakes but not in finding out the accurate model.
5. What is a ReLU activation Function?
- a. Every neuron of the neural network requires an activation function. Without activation function, the neural network becomes nothing but a Linear Regression. By adding activation function, we add non-linearity to the model -- thereby increasing complexity, but performance as well. There are many types of activation functions - Sigmoid, Tanh, ReLU etc.
 - b. [ReLU \(Rectified Linear Unit\)](#) is the most preferred activation function because the other functions suffer from what is called **vanishing gradient problem**. For more learning

about ReLU, refer [Jason Brownlee's Tutorial](#).



6. Images for cat recognition is an example of “structured” data, because it is represented as a structured array in a computer. True/False?
 - a. General thumb of rule is that you will be able to put structured data in excel sheets / tabular form. Can you do so for cat images?
7. A demographic dataset with statistics on different cities' population, GDP per capita, economic growth is an example of “unstructured” data because it contains data coming from different sources. True/False?
 - a. Same explanation as above.
8. Why is an RNN (Recurrent Neural Network) used for machine translation, say translating English to French?
 - a. Whenever there is a time series, RNN is a better neural network architecture. When things happen one after the other (like in a speech), RNNs are useful. Thus they are used in Machine Translation. In contrast, CNNs are used for image classification.

9. In this diagram which we hand-drew in lecture, what do the horizontal axis (x-axis) and vertical axis (y-axis) represent?
- a. The diagram refers to the relation between amount of data and performance of various AI models. We already discussed this in a previous explanation.
10. How size of the neural network, size of data affects the performance of the model.



- a.
- b. As previously discussed, big data and deep neural networks will benefit the model performance. That doesn't mean you use a 100 layered ANN for a simple prediction problem. If you observe the graph, when the data is less, any model has almost the same level of performance. So use a simple Machine Learning model when you have small data.