# ProTech Professional Technical Services, Inc.

## Beginning Application Development with TensorFlow and Keras

## Course Summary

### Description

This course covers the development of a real-world application powered by TensorFlow and Keras. TensorFlow is popular software created by Google (and open source contributors) to facilitate the development of machine learning applications, particularly those that use deep learning. Keras is an interface that facilitates the development of deep learning models.

The course starts with a hands-on introduction to TensorFlow and Keras. Then we move to the architecture of an example model, selecting the right layers to solve an example problem (predicting Bitcoin prices). Then we move on to the training and evaluation of the model. We will finish by deploying the model as a real-world product: a web-application (with an HTTP API) that uses Flask to make our model predictions available to the world.

This is a 2-day course packaged with the right balance of theory and hands-on activities that will help you easily learn TensorFlow and Keras from scratch.

This course will provide you with a blueprint of how to build an application that generates predictions using a deep learning model. From there you can continue to improve the example model—either by adding more data, computing more features, or changing its architecture—continuously increasing its prediction accuracy, or create a completely new model, changing the core components of the application as you see fit.

### Objectives

After taking this course, students will be able to:
- Create a blueprint of the complete process for deploying a deep learning application: from environment setup to model deployment.
- Understand, after a hands-on introduction to TensorFlow and Keras, the popular technologies for building production-grade deep learning models.
- Create an example web-application that uses an HTTP API interface to retrieve model predictions.

### Topics

- Introduction to Neural Networks and Deep Learning
- Model Architecture
- Model Evaluation and Evaluation
- Productization

### Audience

This course is designed for developers, analysts, and data scientists interested in developing applications using TensorFlow and Keras.

### Prerequisites

There are no prerequisites for this course.

### Duration

Two days

Course Outline

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I.   *Introduction to Neural Networks and Deep Learning*
   A.   What are Neural Networks?
   B.   Configuring a Deep Learning Environment

II.  *Model Architecture*
   A.   Choosing the Right Model Architecture
   B.   Using Keras as a TensorFlow Interface

III. *Model Evaluation and Evaluation*
   A.   Model Evaluation
   B.   Hyperparameter Optimization

IV.  *Productization*
   A.   Handling New Data
   B.   Deploying a Model as a Web Application