CLOUD x LAB

CERTIFICATE PROGRAM

MLOps Certification Training

150+ Hours of Training | 17+ Projects | Self Paced Online Course

CloudxLab & Course

Machine Learning Operations (MLOps) refers to the tools, techniques and practical experiences required to train your machine learning models and deploy and monitor them in production. After we have trained our machine learning model, the next big task is to deploy the model to production and scale it so that more users can use it. In this course, you will learn how to use various tools and methodologies to do all this effectively.While knowing machine learning and deep learning concepts is essential, but for building a successful career in Artificial Intelligence, you need to have good experience with production engineering capabilities. This course deep-dives into machine learning and deep learning algorithms along with building expertise in DevOps technologies.

By the end of this program, you will be ready to

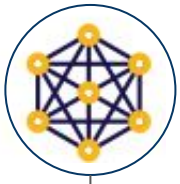
- Design a machine learning system end-to-end starting from project scoping, data needs, modeling and deployment
- Build pipelines for optimizing the model training process
- Apply various machine learning and deep learning algorithms to solve your business problems
- Use Spark MLlib for distributed model training
- Deploy your machine learning models to production using CI/CD pipelines
- Monitor and visualize the performance of your system
- Gain practical knowledge in TensorFlow, Keras, Linux, Git, Python, Docker, Kubernetes, Ansible, Terraform, Graffana, Prometheus and Jenkins

Sandeep Giri

Founder at CloudxLab

Why CloudxLab

Earn a Verified Certificate from CloudxLab



Learn Machine Learning from industry experts and become expert in Machine Learning and DevOps domain

Online cloud lab for hands-on for real-world experience

Best-in-class support Throughout your learning journey

Lifetime course access

Work on real-world projects.

Interact with the international community of peers via the discussion forum.

Course Creators

Sandeep Giri

Founder at CloudxLab

Past: Amazon, InMobi, D.E.Shaw

Course Developer

Know More

Abhinav Singh

Co-Founder at CloudxLab

Past: Byjus

Course Developer

Know More

Praveen Pavithran

Co-Founder at Yatis

Past: YourCabs, Cypress Semiconductor

Course Advisor

Know More

Course Curriculum

Course 1: Foundations

- Programming Tools and Foundational Concepts
- Getting Started with Git
- Python Foundations
- Machine Learning Prerequisites(Including Numpy, Pandas and Linear Algebra)
- Getting Started with SQL
- Analytics and Data Sciences

Course Curriculum

Course 2: Machine Learning

1. Machine Learning Applications & Landscape

- Introduction to Machine Learning
- Machine Learning Application
- Introduction to AI
- Different types of Machine Learning - Supervised, Unsupervised

2. Building end-to-end Machine Learning Project

- Machine Learning Projects Checklist
- Get the data
- Launch, monitor, and maintain the system
- Explore the data to gain insights
- Prepare the data for Machine Learning algorithms
- Explore many different models and short-list the best ones
- Fine-tune model

3. Classification

- Training a Binary classification
- Multiclass,Multilabel and Multioutput Classification
- Performance Measures
- Confusion Matrix
- Precision and Recall
- Precision/Recall Tradeoff
- The ROC Curve

Course Curriculum

Course 2: Machine Learning

4. Machine Learning Algorithms

- Underpinnings of Machine Learning
- Design and Construct
- Challenges in Machine Learning Project

5. Introduction to Artificial Neural Networks

- From Biological to Artificial Neurons
- Implementing MLPs using Keras with TensorFlow Backend
- Fine-Tuning Neural Network Hyperparameters

Course Curriculum

Course 3: DevOps

1. Introduction

- What is DevOps ?
- 10,000 foot view
- Why DevOps ?
- Dev-Test-Deploy
- DevOps Principles
- DevOps Toolchain
- Overview of DevOps Tools
- Co-relation between Agile and DevOps
- Categories of DevOps Tools
- Summary

2. Version Control with Git

- Objective
- What is SCM
- Git branching and merging
- Git Overview
- Creating pull request
- Code Review
- Merging changes
- Lab: Create a repo and push code on GibHub / Bitbucket
- Advanced topic

Course Curriculum

Course 3: DevOps

3. Containers

- Containers Concepts
- Container Vs Virtual Machine
- Installing docker on CentOS, Debian and Windows
- Managing Container with Docker Commands
- Building your own docker images
- Docker Compose
- Docker registry - Docker Hub
- Networking inside single docker container
- Lab - Running Python Web App in docker container
- Lab - Create a docker image from git repo
- Lab - Deploying flask app using docker-compose
- Lab - Complex deployment using docker-compose
- Lab - Creating your own docker registry

4. Docker Swarm

- What is Docker Swarm ?
- Creating Swarm
- Deploy Service on Swarmand Service scaling
- Applying rolling update and Managing Swarm
- Draining node
- Lab - Create your own swarm cluster
- Lab - Install Docker Machine
- Lab - Deploy Flask app as Highly available service
- Lab - Apply Rolling update for flask app
- Lab - Deploy Voting app in Docker Swarm

Course Curriculum

Course 3: DevOps

5. Automate Docker Swarm on AWS

- Install AWSCLI
- Configure AWSCLI
- Create Swarm on AWS
- Deploy service on Swarm

6. Kubernetes

- Introduction to Kubernetes
- Architecture and Kubernetes cluster installation
- Raft Consensus Algorithm and Networking in Kubernetes
- Installing Minikube and Objects in Kubernetes - Pod, Deployment
- Services - Service Discovery, Service Object, Headless Services, Service Type
- Role based Access
- Volumes - Persistent Volumes, Persistent Volume Claim, Storage Class
- Config Map and Secrets
- Ingress - Virtual Host, Types, Fanout, Virtual Host, Fanout Ingress configuration, Virtual Host Ingress configuration
- Lab - Installing Minikube on EC2
- Lab - Enable and access Dashboard Addon
- Lab - Deploy flask webapp on Minikube
- Lab - Deploy Nginx app on Minikube
- Lab - Deploy application with host type volumes

Course Curriculum

Course 3: DevOps

7. Kubernetes

- Lab - Deploy application with host type volumes
- Lab - Create Elastic File system on AWS
- Lab - Deploy nginx using PersistentVolume from AWS EFS
- Lab - Create AWS Storage class backed by EBS storage
- Lab - Deploy Flask app as daemon set
- Lab - Deploy Flask app with different labels
- Lab - Run Kuard pod to view secret
- Lab - Access Flask app without service
- Lab - Access Flask app through service
- Lab - Deploy and access Headless service

Course Curriculum

Course 3: DevOps

8. Continuous Integration using Jenkins

- Introduction to Jenkins
- Continuous Integration & Continuous Integration with Jenkins
- Jenkins Architecture
- Installing Jenkins on EC2
- User management
- Set up Jenkins Master & Slave
- Setup CI-CD pipeline for sample project
- Lab - Setup Role based access
- Lab - Master/Slave Setup
- Lab - Configure SCM in Jenkins

9. Continuous Monitoring with Prometheus and Graffana

- Introduction to Prometheus
- Prometheus installation
- Introduction to Grafana
- Grafana Installation
- Integration of Prometheus and Grafana
- Adding customised dashboard in Grafana
- Introduction to node exporter
- Integrating node exporter for monitoring
- Monitoring docker and containers
- Lab. - Scrape metric from Grafana
- Lab - View Node exporter metric in Grafana
- Lab - View Docker metric in Grafana
- Lab - Import AWS EC2 dashboard in Grafana

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Projects

- **Deploying Single Container Static App with Docker & Travis CI on AWS Elastic Beanstalk**

  We will see how to create, dockerize and automate the hosting of a simple static website. In the process, we will learn how to push the code to GitHub, enable Travis to track changes in that repository, deploy on the AWS Elastic Beanstalk using S3 and IAM, host the app on a public domain bought from Google Domains, and configure it with the help of Amazon Route 53.
- **Deploying Multi Container Flask App with Docker & Travis CI on AWS Elastic Beanstalk**

  We will deploy the multi-container Flask app (Nginx, uWSGI, Redis and PostgreSQL) on AWS Elastic Beanstalk
- **Deploying Single Container Flask app with Docker, Travis CI, AWS RDS & AWS ElastiCache on AWS Elastic Beanstalk**

  We will deploy the Flask app on AWS Elastic Beanstalk using Docker, RDS(PostgreSQL),ElastiCache(Redis) and Travis CI**.**
- **Testing Single Container Static App Locally on Minikube**

  We will understand what is Kubernetes and what is Minikube. As part of the hands-on, we will learn to set up Minikube with VirtualBox in Windows 10 Home system. We will learn various concepts of Kubernetes like pods, deployments, services, and ingress, and have a look at how we could create them in various ways using different commands. We will also deploy the single container static web application - which we have dockerized as part of the Docker, Travis, and AWS project series - and access it using Kubernetes ingress.
- **Deploying Single Container Static App on Google Kubernetes Engine**

  We will learn how to deploy a static website on the Google Cloud Platform (GCP). It is very highly recommended to go through the project Testing App Locally on MiniKube, as the current project is dependent on that.
- **Automating Deployment of Single Container Static App on Google Kubernetes Engine with Docker & Travis CI**

  We will see how to automate the process of deploying a static web app onto GKE with the help of a shell executable and Travis-CI.

Projects

- **Deploying Multi-Container App on Minikube and GKE**
  We will understand how to deploy a multi-container application on Minikube and GKE. We will learn about Kubernetes Secrets and Kubernetes Persistent Volume Claim. By the end of this project, we will be able to appreciate the use of MiniKube before deploying an application onto production, like onto Google Kubernetes Engine.
- **Churn Email Inbox with Python**
  Churn the mail activity from various individuals in an open source project development team.
- **Predicting the median housing prices in California**
  In this project we will build a machine learning model to predict housing prices. We will learn various data manipulation, visualization and cleaning techniques using various libraries of Python like Pandas, Scikit-Learn and Matplotlib.
- **Forecast Bike Rentals**
  Forecasting Bike Rentals with DecisionTreeRegressor, LinearRegression, RandomForestRegressor using scikit-learn. In this project, you will use Python and scikit-learn to build models using the above-mentioned algorithms, and apply them to forecast the bike rentals**.**
- **Noise removal from the images**
  Build a model that takes a noisy image as an input and outputs the clean image.
- **Deploy Machine Learning models to production**
  Build a model that takes a noisy image as an input and outputs the clean image.
- **Predict which passengers survived in the Titanic shipwreck**
  The sinking of the RMS Titanic is one of the most infamous shipwrecks in history. In this project, you build a model to predict which passengers survived the tragedy
- **Build a spam classifier**
  Train the MNIST model, save the model to the file, load the model from the file in the flask app and predict the digit for the new images.

Projects

- **Deploy Machine Learning models to Production using Flask**
  Learn how to deploy a machine learning model as a web application using the Flask framework.
- **Build a Neural Network for Image Classification with TensorFlow**
  Learn how to build and train a dense neural network on the Fashion MNIST dataset and evaluate its performance with some test samples.
- **Image Classification with Pre-trained InceptionV3 Network**
  This project aims to impart the knowledge of how to access the pre-trained models from TensorFlow 2, and appreciate its powerful classification capacity by making the model predict the class of an input image.

Course Details and Fees

Please find more information about the course and fees here:
https://cloudxlab.com/course/116/mlops-certification-training

Our Esteemed Customers

For Further Details

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