



Study Jam

Machine Learning Crash Course Study Jam (MLCC)
Community Organizer Guide
June, 2018-December, 2018

What is a Study Jam?

Study Jams are community-run study groups for developers on Google Developers content, on various product topics.

The objective of Study Jams is to raise the technical proficiency of our global community members through the highest possible course completion rate.

Why host ML Study Jam?

Study Jams are a great opportunity to bring members of your community together to learn something new or advance their knowledge, with the help of a community facilitator. Skills learnt in this workshop can be used for personal development or career advancement.

As a complement to large tech talks and viewing party events that you may already be hosting, the Machine Learning Study Jam framework brings together a small group of your members who are interested in learning about Machine Learning.

Machine Learning Crash Course



With TensorFlow APIs





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What is MLCC?

Please complete this course before your facilitate any study jams.

Definition of MLCC

Machine Learning Crash Course is.....

Vision: A course to help take people from minimal or no ML knowledge to a point where they can train simple linear or neural network models in TensorFlow. We aim to give them enough knowledge to understand various pitfalls, classic errors, and tradeoffs.

Course website: <https://g.co/mledu/studyjams-IN>

Languages Available: Spanish, French, English, Korean, Chinese



Intended audience

Machine Learning Crash Course (MLCC) is intended for those who wish to learn about **ML from a practical, applied perspective** that will enable them to use machine learning within their everyday projects, and who wish to benefit from the power of **TensorFlow** wrapped in convenient higher-level abstractions.

This is a great opportunity for audience with basic technical knowledge and limited Machine Learning knowledge willing to gain some practical experience in ML and TensorFlow.

Course Outline - ML Concepts (1/4)

A list of ML
concepts
covered in the
course

Introduction

Goals

Prerequisites and Prework

ML Concepts

Introduction to ML (3 min)

Framing (15 min)

Descending into ML (20 min)

Reducing Loss (60 min)

First Steps with TF (60 min)

Generalization (15 min)

Training and Test Sets (25 min)

Validation (40 min)

Representation (65 min)

Feature Crosses (70 min)

Regularization: Simplicity (40 min)

Logistic Regression (20 min)

Classification (90 min)

Regularization: Sparsity (45 min)

Introduction to Neural Nets (55 min)

Training Neural Nets (40 min)

Multi-Class Neural Nets (50 min)

Embeddings (80 min)

Introduction to Machine Learning

☆☆☆☆

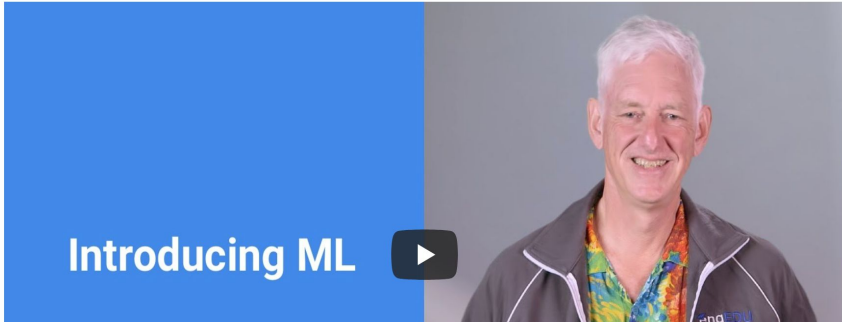
This module introduces Machine Learning (ML).

Estimated Time: 3 minutes

Learning Objectives

- Recognize the practical benefits of mastering machine learning
- Understand the philosophy behind machine learning

Introducing ML



Course Outline - ML engineering (2/4)

A list of ML Engineering topics covered in the course

- ML Engineering
 - ▶ [Production ML Systems \(3 min\)](#)
 - ▶ Static vs. Dynamic Training (7 min)
 - ▶ Static vs. Dynamic Inference (7 min)
 - ▶ Data Dependencies (14 min)
- ML Real World Examples
 - ▶ Cancer Prediction (5 min)
 - ▶ 18th Century Literature (5 min)
 - ▶ Real-World Guidelines (2 min)
- Conclusion
 - ▶ Next Steps

Production ML Systems



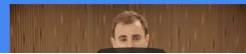
There's a lot more to machine learning than just implementing an ML algorithm. A production ML system involves a significant number of components.

 **Estimated Time:** 3 minutes

Learning Objectives

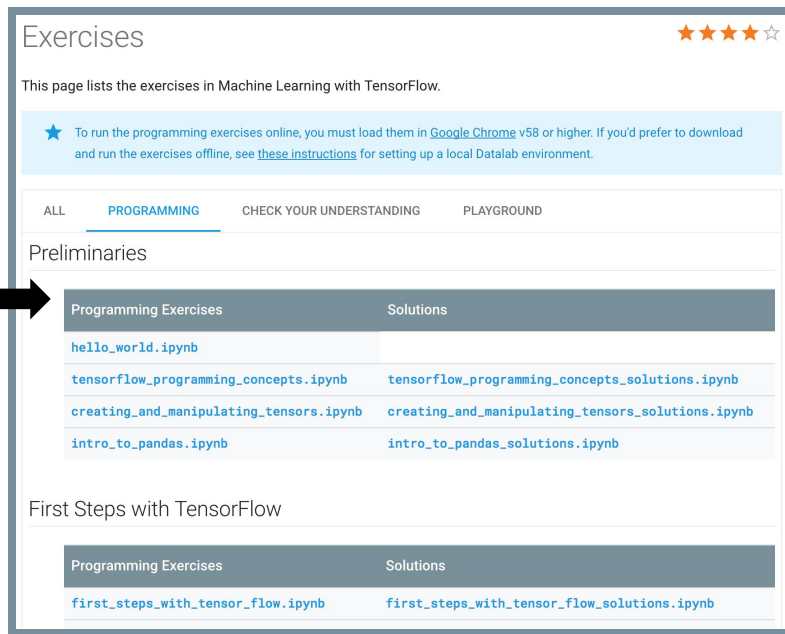
- Understand the breadth of components in a production ML system.

Production ML Systems



Course Outline - Exercises (4/4)

A list of ML
related exercises



The screenshot shows a web page titled 'Exercises' with a star rating of four stars and one empty star. Below the title, a message states: 'This page lists the exercises in Machine Learning with TensorFlow.' A blue box contains a star icon and text: 'To run the programming exercises online, you must load them in [Google Chrome](#) v58 or higher. If you'd prefer to download and run the exercises offline, see [these instructions](#) for setting up a local Datalab environment.'

Navigation tabs include 'ALL', 'PROGRAMMING' (selected), 'CHECK YOUR UNDERSTANDING', and 'PLAYGROUND'.

The page is divided into two main sections: 'Preliminaries' and 'First Steps with TensorFlow'.

Preliminaries

Programming Exercises	Solutions
hello_world.ipynb	
tensorflow_programming_concepts.ipynb	tensorflow_programming_concepts_solutions.ipynb
creating_and_manipulating_tensors.ipynb	creating_and_manipulating_tensors_solutions.ipynb
intro_to_pandas.ipynb	intro_to_pandas_solutions.ipynb

First Steps with TensorFlow

Programming Exercises	Solutions
first_steps_with_tensor_flow.ipynb	first_steps_with_tensor_flow_solutions.ipynb

Course Outline - Real world ML examples (3/4)

A list of Real
world ML
examples
covered in the
course

Introduction (5 min)
Linear Regression (70 min)
Regularization: Simplicity (40 min)
Logistic Regression (20 min)
Classification (90 min)
Regularization: Sparsity (45 min)
Introduction to Neural Nets (55 min)
Training Neural Nets (40 min)
Multi-Class Neural Nets (50 min)
Embeddings (80 min)
Engineering
Production ML Systems (3 min)
Static vs. Dynamic Training (7 min)
Static vs. Dynamic Inference (7 min)
Data Dependencies (14 min)
Real World Examples
Cancer Prediction (5 min)
18th Century Literature (5 min)
Real-World Guidelines (2 min)
Conclusion
Next Steps


In this lesson, you'll debug a real-world ML problem* related to cancer prediction.

🕒 Estimated Time: 5 minutes

📖 Learning Objectives

- Determine flaws in real-world ML models.

Real World Example: Cancer Prediction



How do I prepare to facilitate ML study jam?

Any student / professional / entrepreneur who is confident with the course content and prerequisites content, can facilitate this course in their community / study group / college.

1. [Course website](#)
2. [Pre-requisites](#)

Facilitator requirements - what you do



Run in-person live session (3-4 hours)



Create and moderate online group or list to provide support
(Google groups, Slack, **Facebook groups** etc)



Guide students through course material (during self study period of 4 weeks)



Complete organizer survey & distribute participant surveys



Facilitator checklist

1	Event Format	<u>How to?</u>
2	Find Venue	<u>How to?</u>
3	Register Your Event (form)	<u>How to?</u>
4	Register Your Event on Meetup (Only for GDGs&WTMs/GCDCs)	<u>How to?</u>
5	Review and Study Resources	<u>How to?</u>
6	Email Templates	<u>How to?</u>
7	Run in-person Event	<u>How to?</u>
8	Self-study period	<u>How to?</u>
9	Submit post course survey	<u>How to?</u>

1. Event Format

[MLCC](#) can be facilitated as a combination of one in-person session followed by self-study time given to the students to complete the course.

- (3-4 hours) **Live in-person session**
- (4 weeks) **Self study period**

These study jams are totally customizable. You can be as creative as you want to make the event more impactful. You may add weekly meetups , codelabs, expert talks, case studies, hackathons, solving problems together etc in study jams.

25
Lessons

40+
Exercises

16
Hours

	Part-1 : Live in-person Session	Part-2: Self study
Total no of hours	4 hours of live event	16 hours of self study - 4 weeks is an ideal duration for professionals
Content breakdown	<p>Brief overview of MLCC course content</p> <p>First 4 modules of ML Concepts, which include hands-on Playground and TF coding exercises</p>	<p>The participants are expected to go through all the remaining units of the course on their own, at their own pace. Weekly meetups to check the progress and conduct tech sessions</p>
Tips	<p>Give a high level overview of course to the audience, have them try couple of initial exercises and encourage them to take self-study.</p>	<p>Define a specific timeline in which the participants have to complete taking the course.</p> <p>Schedule weekly Q&A hangout/maintain slack channel to respond queries coming in.</p>

2. Find Venue



Find a place which has -

- Internet connection, wifi or ethernet (course can NOT be accessed offline).
- A whiteboard for describing concepts in more detail
- Chairs and tables (classroom or lab setup).
- Power outlets. The event will run for about 6-8 hours.

You can either use lab computers or ask the participants to bring their own laptops. Please make sure the systems have Chrome v58 or later.

[Optional] A projector that the Facilitator can use to share their screen with the attendees.

3. Register Your Event

Once the tentative dates and format is decided, submit the [Event Registration Form](#).

We strongly encourage you to fill up this form minimum of **15 days in advance** so that you can receive required resources and support from us on time.

Please keep the events open to everyone in your region.

In case of multiple facilitators, only fill up the form once (per community/per chapter/per college).

Ensure to maintain a ratio of at least **1 facilitator + 1 Instructor for at least 50 students**. It may vary as per the event format and participants too.

4. Register Your Event on Meetup

This step is mandatory for GDGs and optional for other groups.



[GDG, WTM and GDCs Only]

Your event should be scheduled some time between **June 1 - November 31**. Make the event 4 hours long. The event title in Meetup **must** contain the words “Machine Learning Study Jam”. Feel free to write your own event description or copy the example description below:

New to Machine Learning but don't know where to start? Join us for a Machine Learning Study Jam where we will run through the Machine Learning Crash Course (MLCC)!

This course is intended for those who wish to learn about ML from a practical, applied perspective that will enable you to use machine learning in your everyday projects and learn about the power of TensorFlow. This is a great opportunity for anyone with basic technical knowledge and limited Machine Learning knowledge willing to gain some practical experience in ML and TensorFlow.

****Bring your laptop!****

Agenda:

12PM: event start

12:30PM: overview & first 3 modules of MLCC

2:15PM: break

2:30PM: TensorFlow modules

4:00PM: event end

5. Review & Study Resources

-
- a. Familiarize yourself with the [pre-work](#).
 - b. Get yourself acquainted with [course content and exercises](#).

6. Mail Templates

We have put together a few email templates which would save time for you to document the communications.

1. [Announcement email](#)
2. [Confirmation email](#)
3. [Reminder email](#)
4. [Week 1 email](#)
5. [Week 2 email](#)
6. [Week 3 email](#)
7. [Week 4 email](#)
8. [Feedback email](#)

Refer to the above templates for content, targeted audience and timing of the email.

7. Run in-person Event

Get into the shoes of a facilitator:

Arrive at least 30 mins early to the room to get settled. Make sure projector, internet, speakers etc are working properly.

Make sure you have a final list of participants and if required, send the same to the security, for entry purpose at the venue.

7. Run in-person Event

Meet and Greet:

As folks come in, go over and introduce yourself individually and welcome them. You won't remember everyone's name, but you may be surprised how many you do, and this can help folks feel welcome and ready to participate. Please check in with them on how they found the pre-work, and answer any questions they might have.

If you're arranging food for participants, make sure to let them know the exact timings of breaks.

Understand the level of the participants and be more relevant to their level.

7. Run in-person Event

Session Time:

Give folks a few minutes after the scheduled start time to trickle in, then start the session and run from there.

Run through the ML concepts video, Engage and discuss the same with the participants, Encourage them to work on exercises and Help solving the queries after.

Remind the participants to fill out the [feedback form](#) towards the end of the delivery.

7. Run in-person Event

30 min	<ul style="list-style-type: none">• Meet and Greet• Make sure everyone has a laptop• Prerequisites check.
10 min	<p>Overview of MLCC</p> <ul style="list-style-type: none">• Briefly explain target audience• topics and scope of course• modality of content (videos, docs, Playground, Colab exercises) <p>Then watch Intro to ML module video as a group.</p>
95 min	<p>Discuss material together of next three modules of MLCC:</p> <ul style="list-style-type: none">• Framing• Descending into ML• Reducing Loss <p>Split into pairs to do the CYU and Playground exercises</p>
15 min	Break
90 min	Watch First Steps with TF video and do the 5 exercises in the module

8. Self-study period

Share with others:
#mlstudyjam

Support:

It is very important to keep the students motivated throughout the course cycle, especially in the self study format.

There will be times when they will get stuck and might give up because there's no one checking in or no one there to help out. Utilise the power of collaboration and community.

Keep in touch with them through different online mediums like email, slack channel, hangout session etc to see if there are any struggles they're facing and if you could help them!

Sharing the progress of your study group on social media could be a great motivation for other study groups. We highly encourage you to share about your events, success stories on social media with hashtag **#IndiaMLCC**

10. Submit Post Course Survey

Your feedback will be valuable for us to enhance the course content as well as the facilitating experience for this course. We'd deeply appreciate your inputs .

Make sure to fill up [Post Course Survey](#) yourself within one week of delivery completion.

Make a [report](#) with your success stories using [this template](#) and share it with us. (Make a copy for yourself ,then edit it then share it with me)

In case of multiple facilitators, only fill up the form once (per community/per chapter/per college).

What's next (1/3)

We're following up with some links to help you continue your journey with Machine Learning and TensorFlow!

1. Machine Learning Courses

- Deep Learning:
<https://www.udacity.com/course/deep-learning-nanodegree-foundation--nd101>
- Stanford's Intro to TensorFlow Course:
<https://web.stanford.edu/class/cs20si/>
- MIT's Intro to Deep Learning Course:
introtodeeplearning.com

What's next (2/3)

We're following up with some links to help you continue your journey with Machine Learning and TensorFlow!

2. TensorFlow

- Visit the TensorFlow homepage to get started!
<https://www.tensorflow.org/>
- Check out these talks from the TensorFlow Developer Summit: <https://goo.gl/0sySql>

And check back for the latest TensorFlow Developer Summit, on March 30th!

What's next (3/3)

*We're following up with some links to help
you continue your journey with
Machine Learning and TensorFlow!*

3. Google Cloud ML

- ML Engine - <https://cloud.google.com/ml-engine/>
- Machine Learning APIs (Image recognition, voice recognition, translation) - <https://cloud.google.com/products/machine-learning/>



Thank You



For any questions, feel free to reach out
to spra@google.com.



Appendix

Extra slides

9. Course delivery tips

We've put together some best practices that would help you facilitate the study jams better.

Refer next 4 slides for the tips!

Course Delivery Tips (1/3)

◆ **Know who's in the room**

- Find out as much as you can about who will be in the room before you get there. The more you know about the group, the individual personalities and the dynamics at play, the better you'll be able to plan for a successful session and a positive experience.

◆ **Affirm all answers**

- Learners need to know that every answer, regardless of how strange or different, is appreciated. When learners know that all answers are good answers (although not always correct), they will be encouraged to share.

◆ **Ask open questions**

- Open questions encourage dialogue and invite ideas, opinions and discussion. Since open questions have no 'yes' or 'no' answers, learners are invited to engage with the content and each other, explore and make sense of the topic for themselves.

Course Delivery Tips (2/3)

Talk less, listen more

- The more learners can discussion, debate, and assess new content, the more they learn. This means: less of you, more of them. You'll need to make sure everyone has a chance to be heard and to hear each other. The best way to do that is to flex your active listening skills.

Unpack the agenda

- As a time-management tip, leaving room for discussion, questions, or extra exercises is usually a good idea within a scripted facilitation session. Leaving some space for learners who learn at different paces or in different styles, as well as time for reflection, discussion, or hands-on exercises is useful for facilitating workshops designed to “learn and do.”

Use your co-facilitator

- If you are lucky enough to have someone you are co-training with, use that person. Discuss how you can best support each other and work as a team.

Course Delivery Tips (3/3)

Be flexible

- The most critical thing to remember about facilitating is to be flexible. Because we never know exactly how a workshop will go and what unexpected events will arise, you need to be able to shorten an activity, add some important language to a definition and change the format of your session so, have some backup plans ready with you.

Manage your time well

- Giving participants a clear sense of time remaining can help here, such as verbally saying “5 more minutes to work on this,” or “take one more minute to finish up.” The timing should appear on screen, but it helps to say it.

Create an inclusive environment, Keep discussions constructive and positive, Encourage participants, Learn from the people around you and Take feedbacks. Also be patient, be confident and believe in yourself.

Be Prepared for Challenges!

▲ **There's an attendee who knows a lot more about Topic X than I do:**

- This is great. It's not your job to be all-knowing—totally fine to act as a facilitator in this case, and allow that attendee to share their knowledge and experience.

▲ **What do I do if everyone finishes early?**

- Maybe you have a room full of stars and everyone finished a given exercise ahead of the time allotted. In this case, you can use the time for extra discussion and recap, extra break time, or skip ahead to the start of the next section.

▲ **What do I do if people are not finished with a given exercise?**

- This can (and does) happen; people work at different speeds. Encouraging pair work is one way to protect against this—it helps keep people on time by slowing the faster folks a little and speeding up the slower ones. But it's important to let people know that they're not expected to totally finish every exercise in class. They can finish up anything they don't get to as a take-home.