Effective Teaching Practices

Hamed Alemohammad, Radiant Earth Foundation

Joyce Nakatumba-Nabende, Makerere University

A Training of Trainers Bootcamp on
Machine Learning for Earth Observations

german cooperation
DEUTSCHE ZUSAMMENARBEIT

Implemented by
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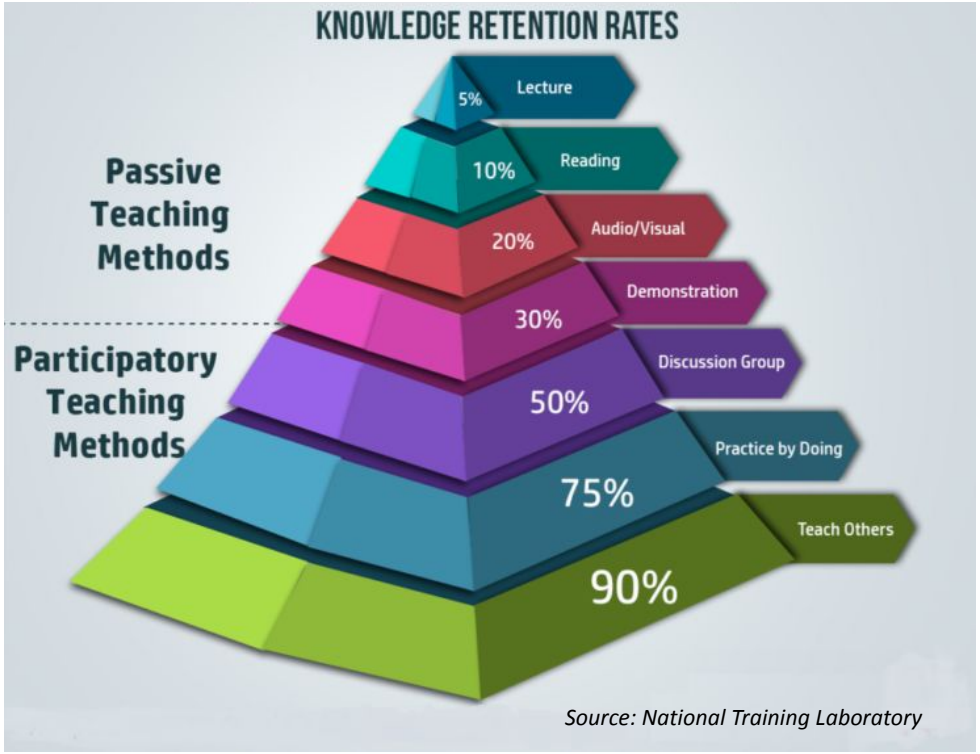
FAIR FORWARD
Artificial Intelligence for all.

Radiant Earth Foundation
EARTH IMAGERY FOR IMPACT

MAKERERE UNIVERSITY

Learning Pyramid



How to be an effective teacher?

Source: Microsoft

Bloom's Taxonomy

Definition

Bloom's taxonomy is a classification system used to define and distinguish different levels of human cognition (thinking, learning, and understanding.)

Purpose

The purpose of Bloom's Taxonomy is to help trainers to guide the development of

- *assessments* (tests and other evaluations of participants learning),
- *curriculum* (lessons, projects, and other learning activities), and
- *instructional methods*(e.g. questioning strategies.)

Critical thinking and higher order cognitive abilities.

Bloom's Taxonomy

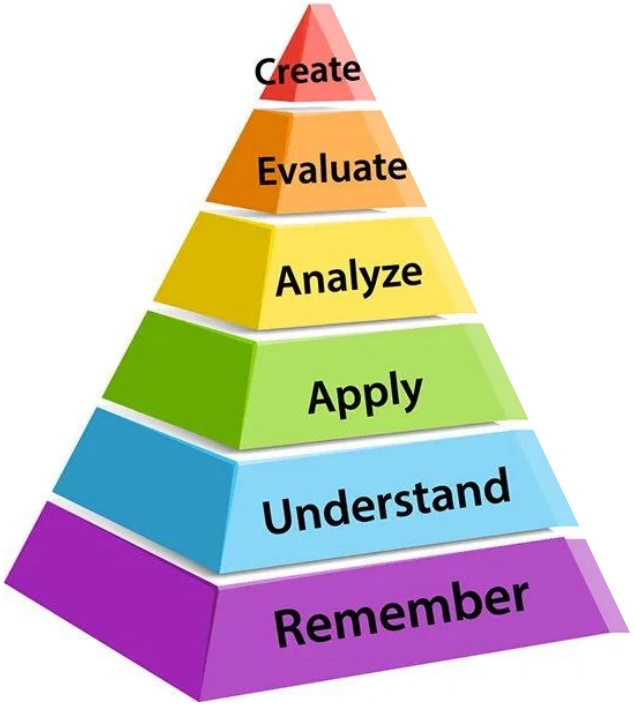
Original Taxonomy (1956)

- By *Benjamin Bloom*, an educational psychologist who made contributions to the theory of mastery learning.
- Bloom edited the first volume of The *Taxonomy of Educational Objectives: The Classification of Educational Goals*
- It was one of the first attempts to systematically classify levels of cognitive functioning.

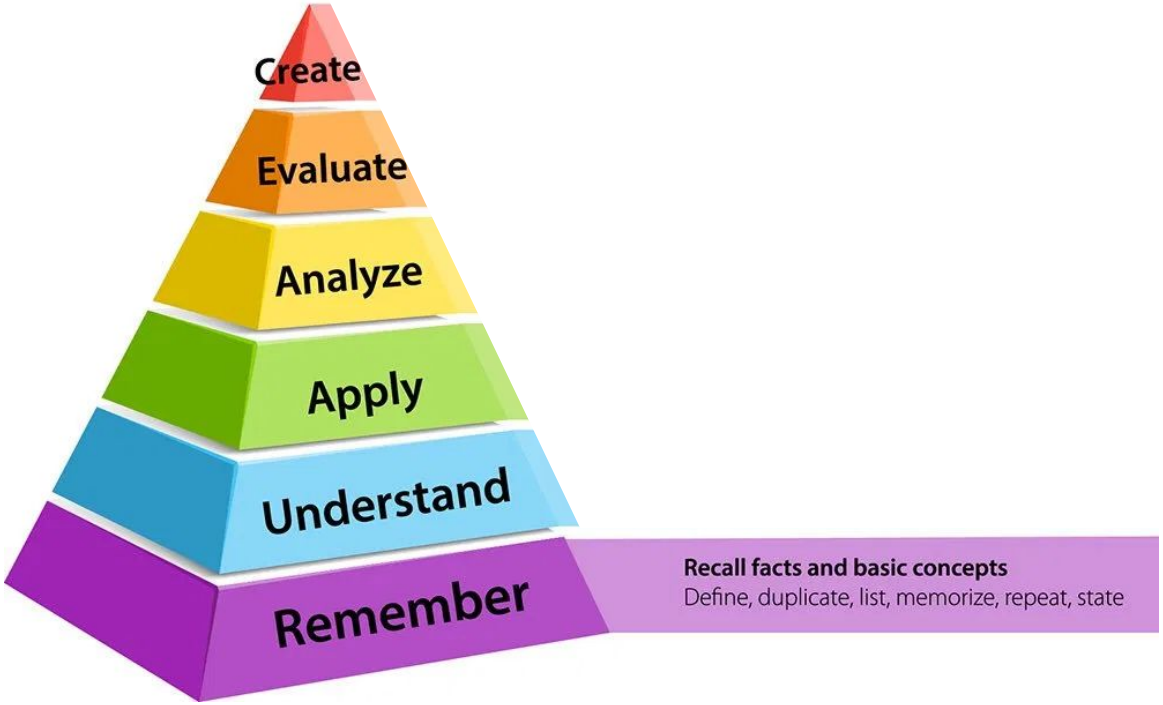
Revised Taxonomy (2001)

- By *Lorin Anderson* (Former student of Bloom)

Bloom's Taxonomy



Bloom's Taxonomy



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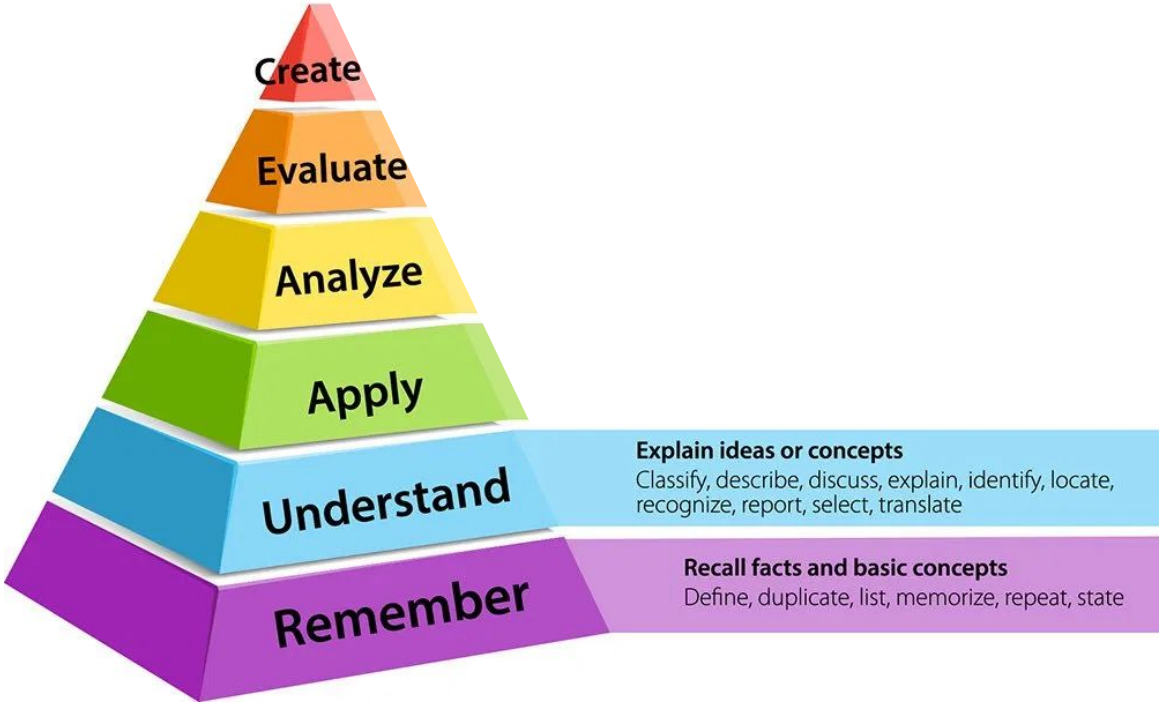

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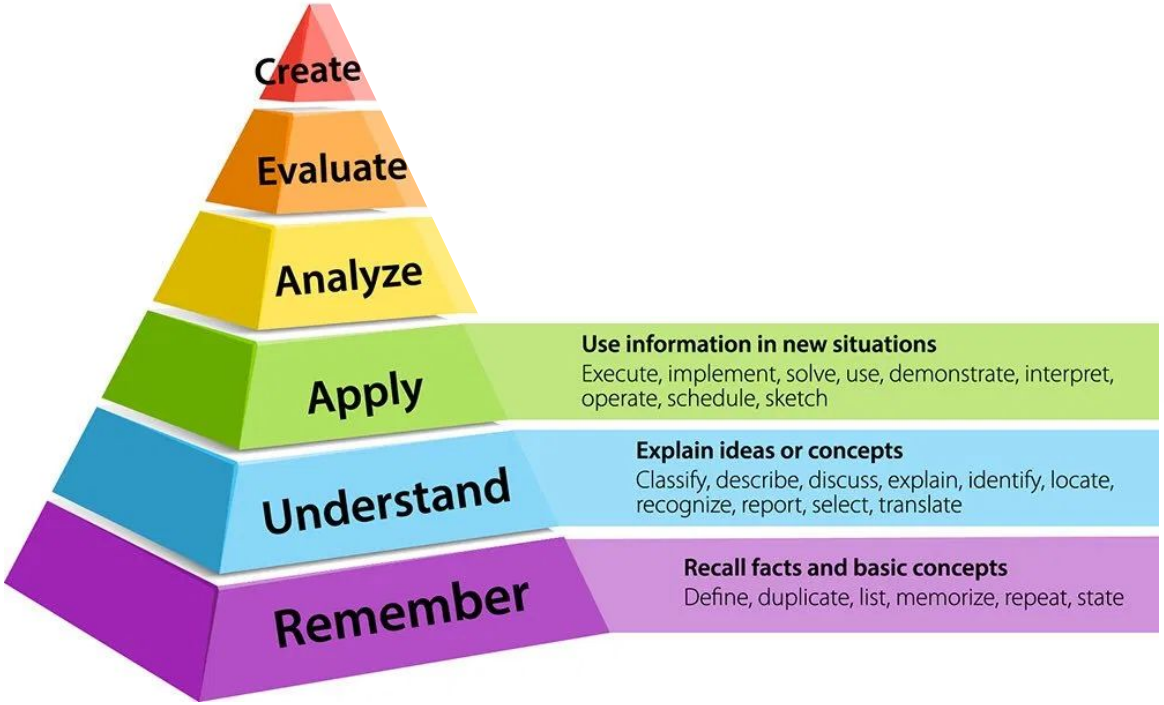

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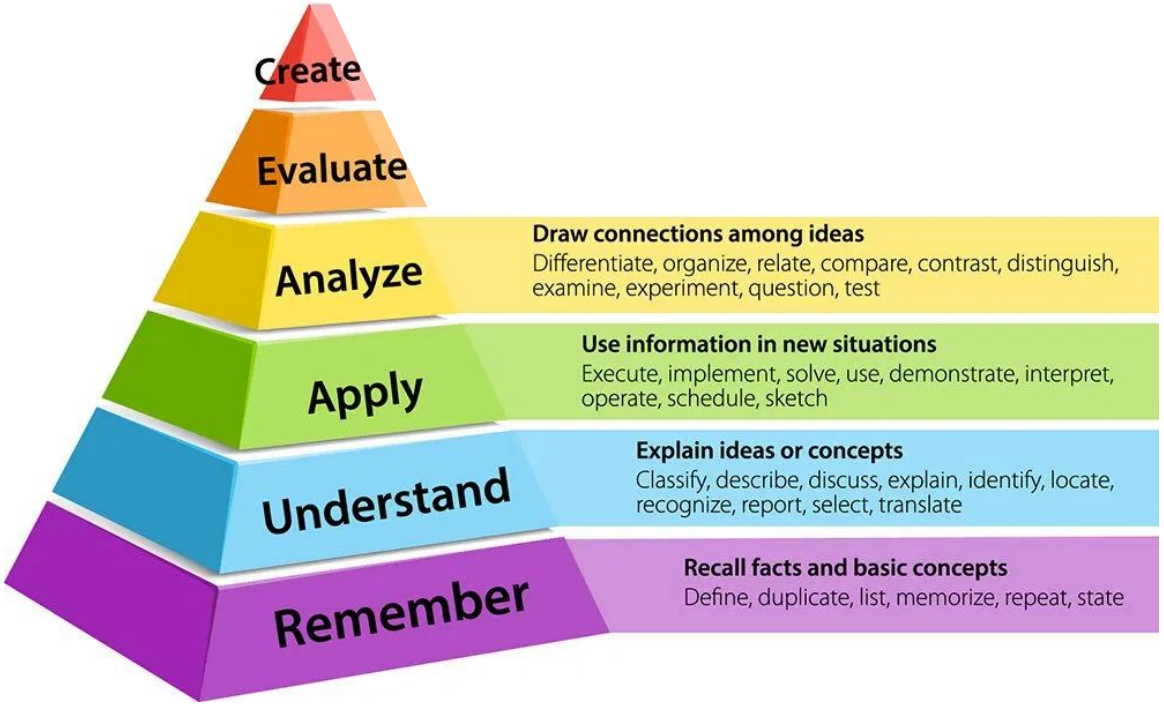

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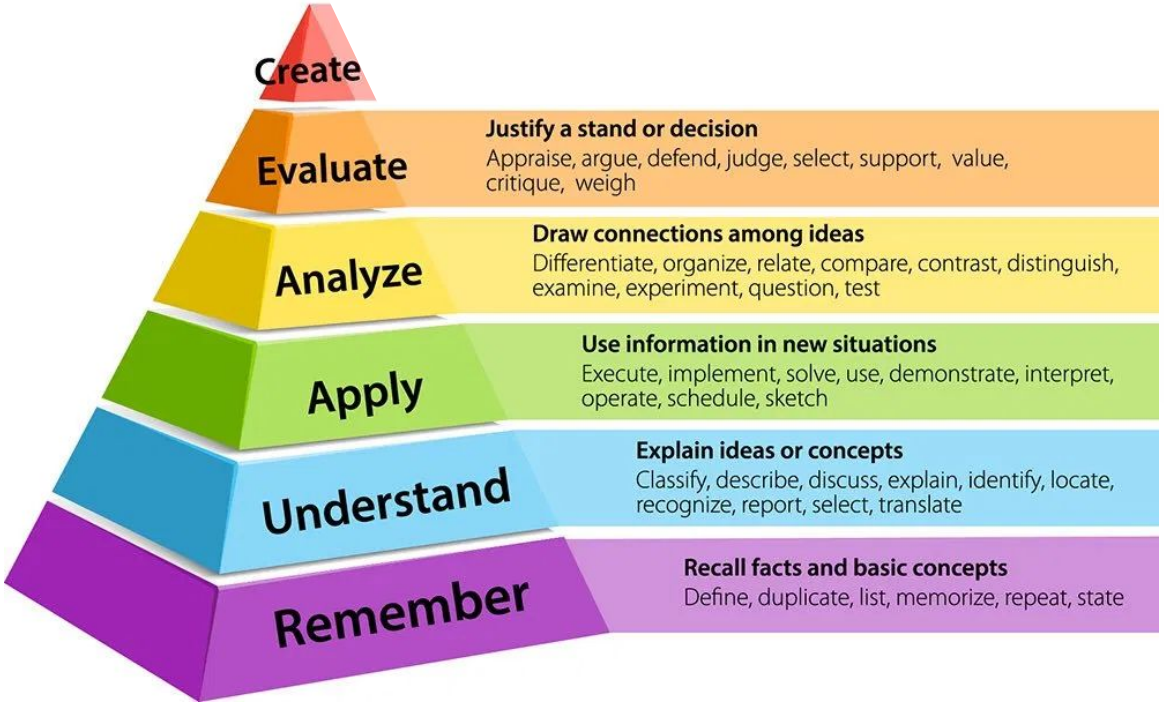

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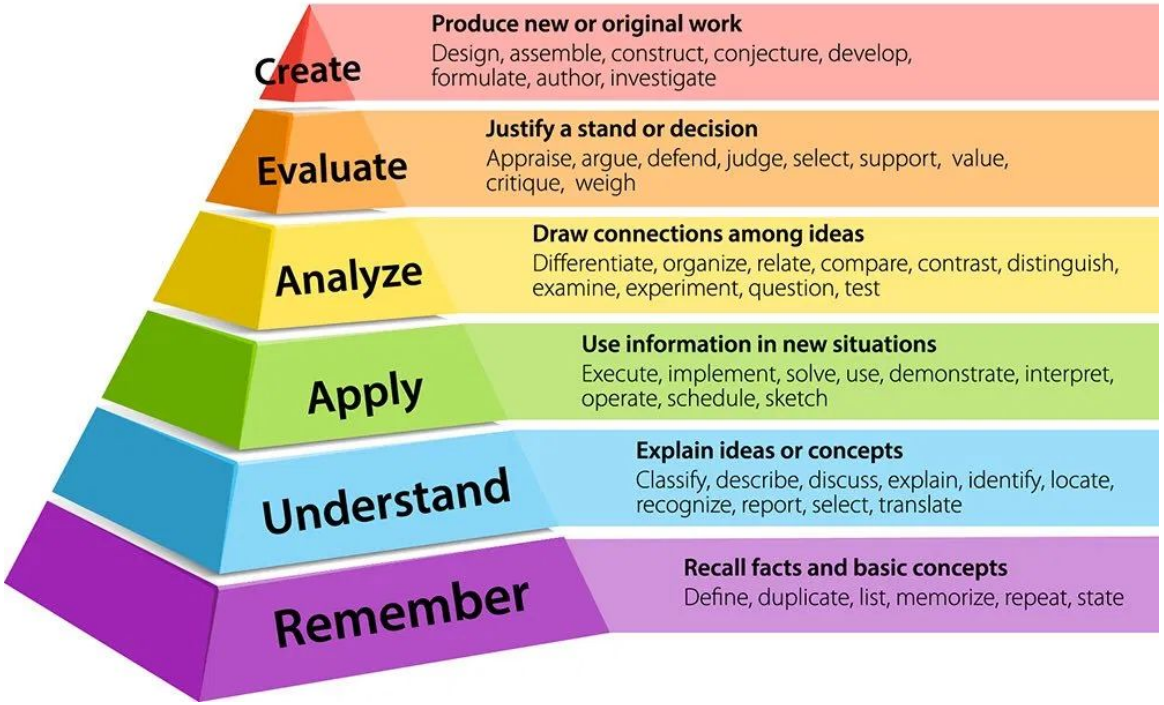


Teaching Tools

- Use online meetings if you cannot meet in person
  - Don’t have Zoom? No problem, you can have a virtual meeting in Slack!
- Set a schedule and target dates for training
- Schedule office hours
  - Encourage them to join and share how the training is going
- Ask them to follow the Jupyter notebooks with you similar to the bootcamp
- Slack channel is open for them to join, and connect with peers
  - Peer learning and asking questions

What's next for you?

- Train at least 5 individuals within your network/community
  - People who can potentially teach others in their networks (not required)
  - People who would benefit the most from the content

- They need to learn all the materials that you learned as part of the bootcamp
  - Use the content on the GitHub repository
  - Use the recordings (to be shared with you soon)
  - *Reach out* to us or other participants on Slack with any questions
  - Feel free to recreate the slides or notebooks

What's next for you?

- Trainings should be 1:1 or as a group
- They *should not* go through all the materials on their own
- It's best if the training is conducted in a similar amount of time (~2 weeks)
- Conduct the training within the next 4 months (until end of September)
- We need confirmation from all of the people you will train before providing you with a certificate for the bootcamp
    - Instructions will be emailed to you next week.

Follow up sessions

- Two follow up sessions will be organized in July and August
  - Details will be emailed to you
- Join those sessions to get updates from us and share your updates
- Bring questions (technical or non-technical)
- Invite your trainees to join too!

ML4EO Bootcamp Recap

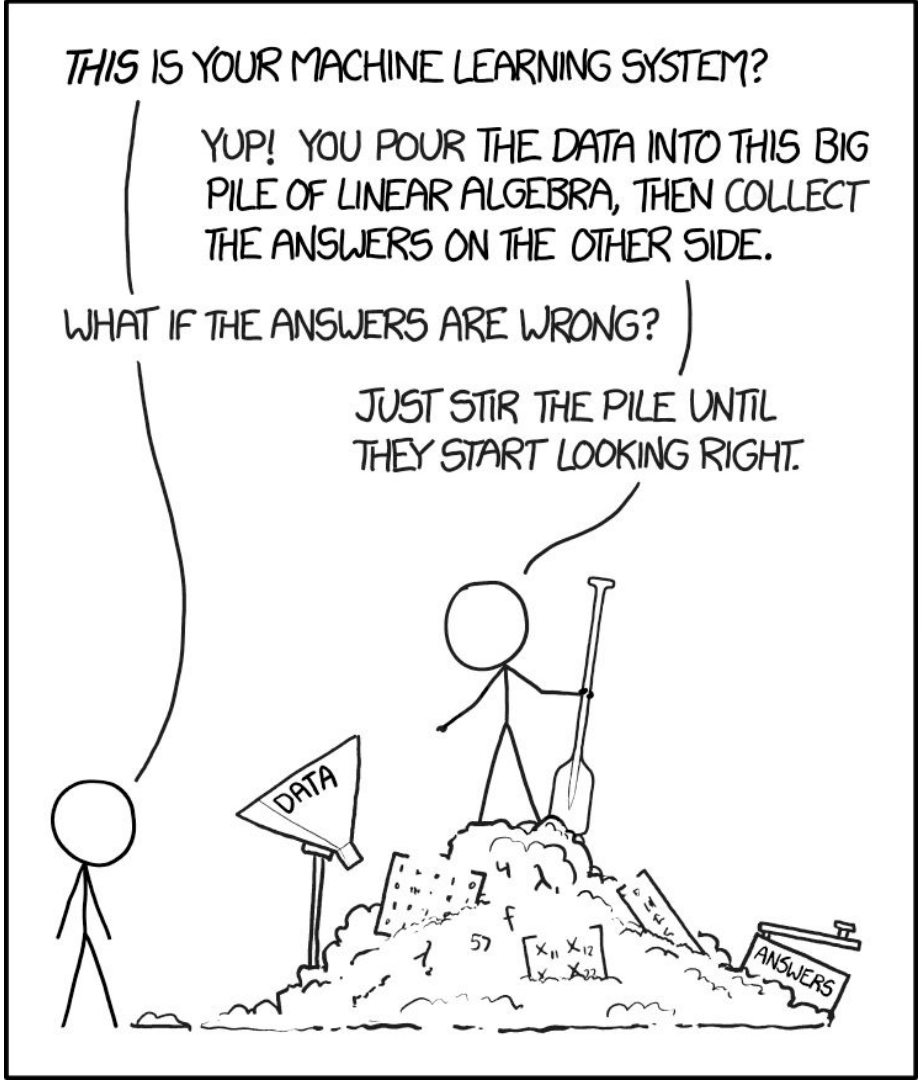
- Two weeks and Eleven Lectures:
  - Remote Sensing of the Earth
  - Geospatial Data Structures and Python
  - Introduction to Machine Learning
  - STAC and Radiant MLHub
  - Crop Type Image Classification
  - Crop Type Segmentation
    - Digital Earth Africa Sandbox
    - Deep Learning-based from ICLR competition
  - Land Cover Classification and Ensemble Models
  - Tropical Cyclone Wind Estimation

And ...

- Continue to work on similar problems.
- Stay in touch with each other, and grow this community
- We would love to hear from you, please share your updates in Slack or just email us!

Bootcamp Survey

- Your feedback is essential to improving your experience and others in future
- You will receive an email from Louisa today
- Please fill it at soon as possible while you remember the details of the bootcamp
- We *highly encourage* you to fill out the survey.
    - It’s anonymous


THIS IS YOUR MACHINE LEARNING SYSTEM?
YUP! YOU POUR THE DATA INTO THIS BIG PILE OF LINEAR ALGEBRA, THEN COLLECT THE ANSWERS ON THE OTHER SIDE.
WHAT IF THE ANSWERS ARE WRONG?
JUST STIR THE PILE UNTIL THEY START LOOKING RIGHT.
DATA
ANSWERS