

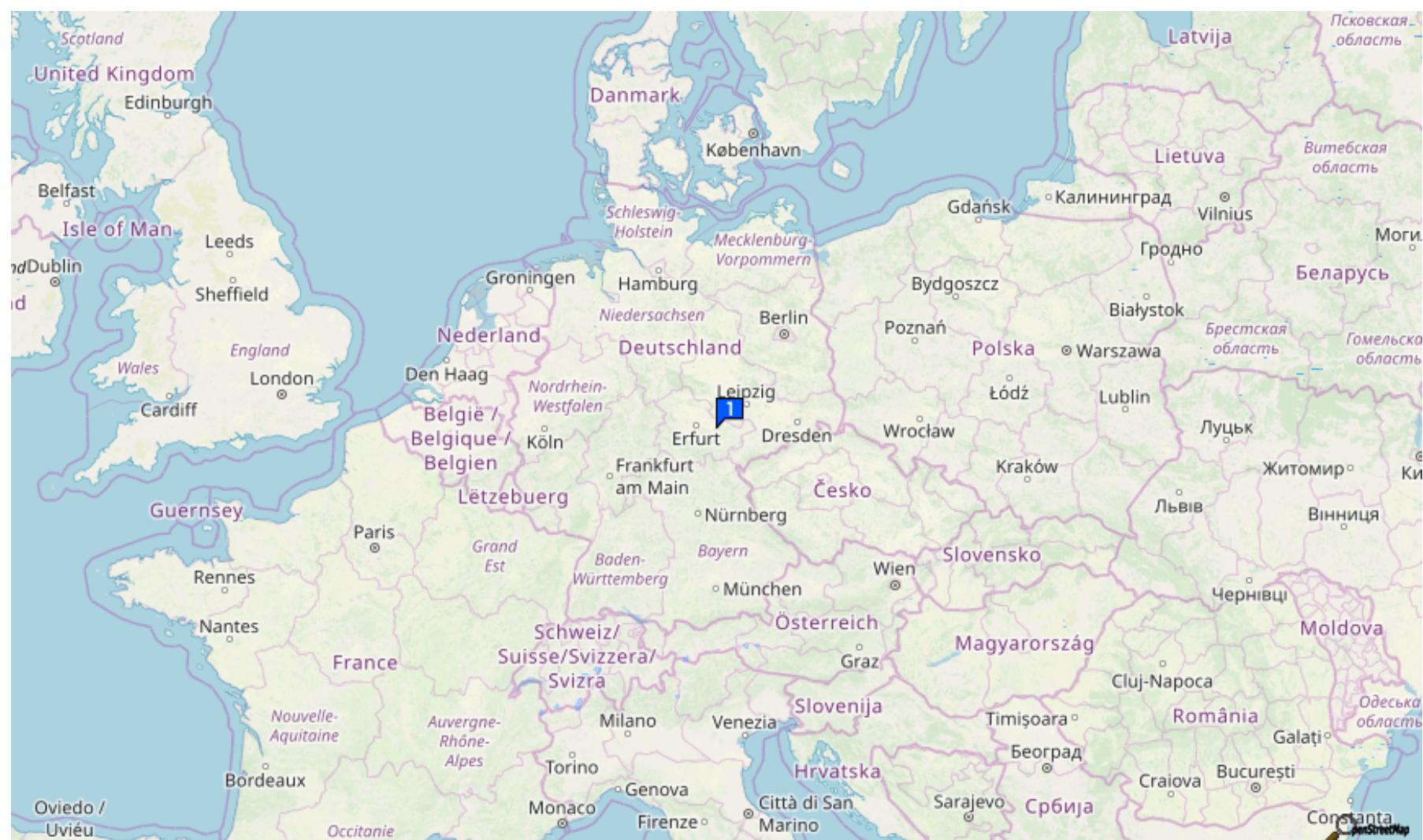
# Learning to learn

## ... And why you should care

1. Introducing us
2. Dunning-Kruger effect
3. Meta learning
4. Metacognition
5. Summary

## But first; about us

### Helge



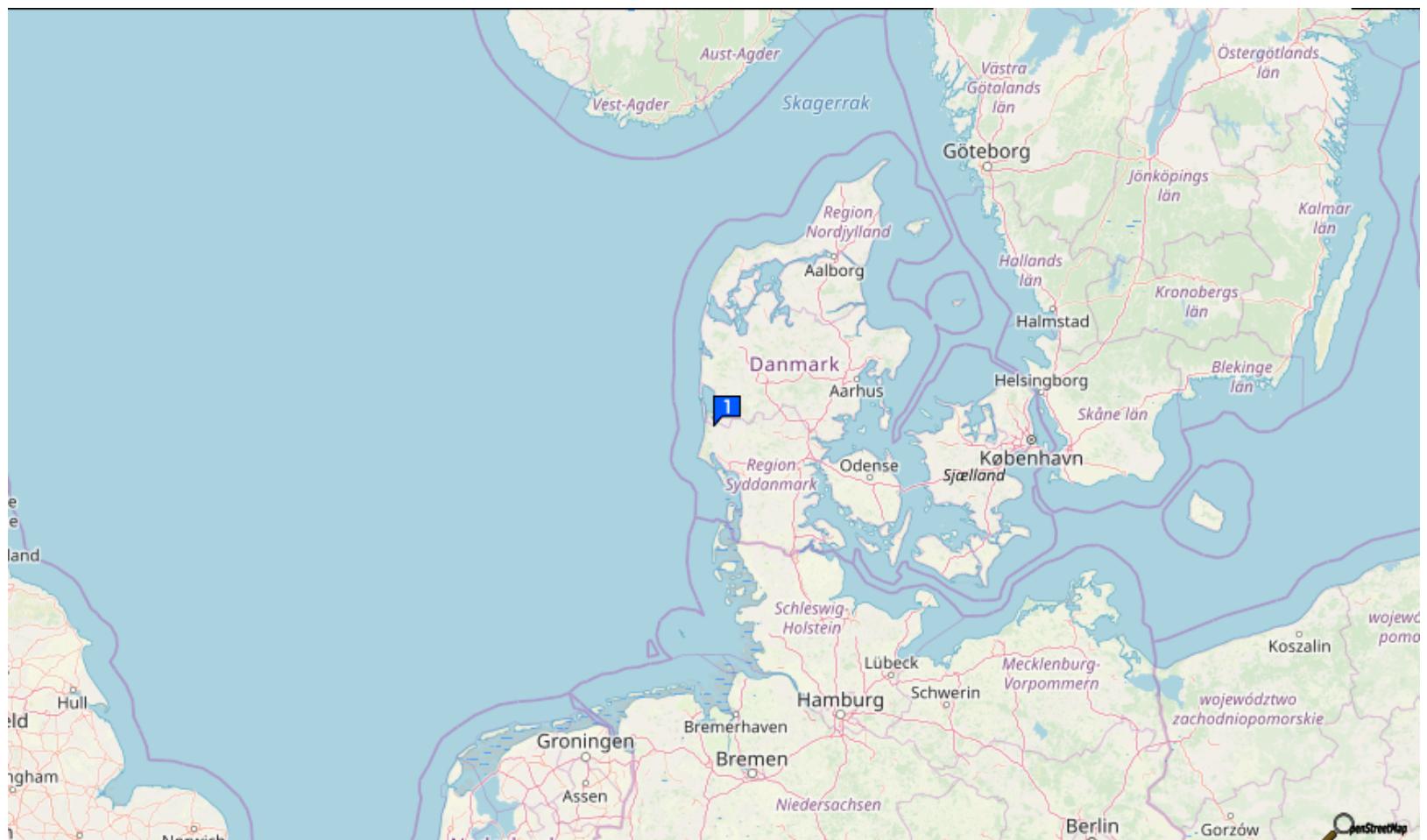
- Dipl-Inf. in Software Engineering from Friedrich-Schiller Universität Jena
- TA and research assistant at Friedrich-Schiller Universität Jena

# Helge



- PhD in Software Engineering from ITU
- Software engineer at DMI
- Lecturer at Cphbusiness
- Since January back to ITU as adjunkt in the Center for Public IT

# Jens



- BSc. political science
- BSc. software development (ITU)
- MSc. IT & Cognition

# Jens



- TA and research assistant at ITU
- Software engineer at CERN
- Lecturer at Cphbusiness
- Researching spiking neural networks

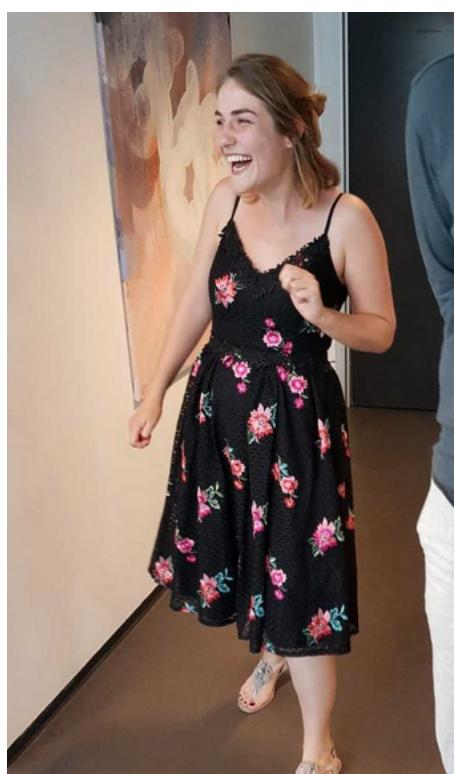
## The TAs

### Anna



- Designer-turned-Data-Science-student at ITU
- Crazy plant lady with a blue belt in taekwondo
- [reis@itu.dk](mailto:reis@itu.dk) (<mailto:reis@itu.dk>)

## Jana



- Bachelor in International Management (Finance & Strategy)
- Got excited about the possibilities of coding at first job in Berlin: An NGO providing web tools for online donations.
- Moved to Denmark and started Master in Software Development in 2017, with specialization in Algorithms.
- Got her degree last week Monday. YAY!
- Super excited to be here. YAY YAY!

## Morten



- Biochemist degree from Aarhus University
- Data Science student at ITU
- ITU tip: Kitchens w/ microwave ovens on 2nd, 3rd, 4th, and 5th floor
- [morg@itu.dk](mailto:morg@itu.dk) (<mailto:morg@itu.dk>)

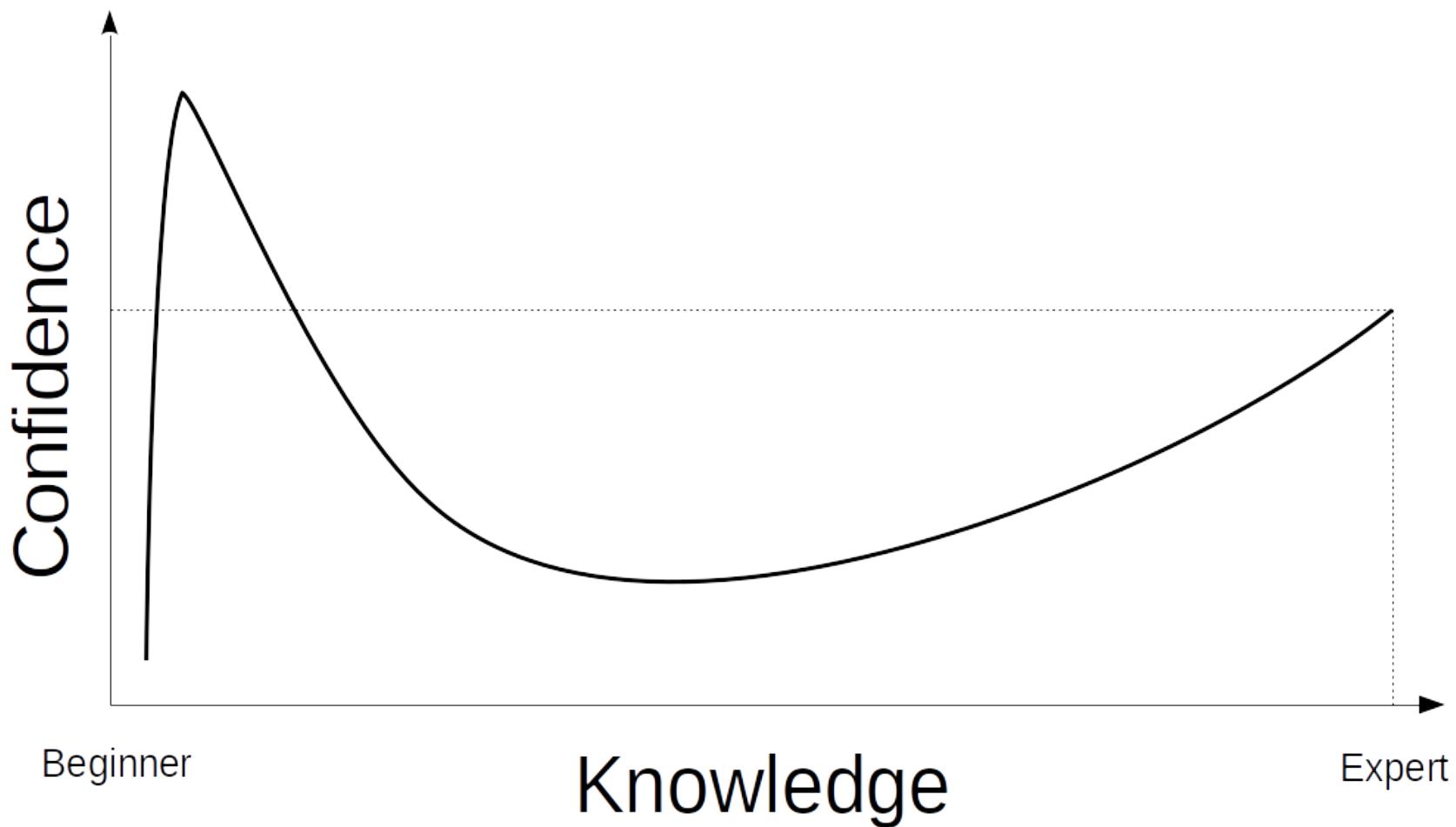
# Viktor



- Data Science
- Culinary school dropout
- Food, climbing and Downton Abbey

## Being human

- Contrary to computers, humans are genius guessing machines
- ... Except when it comes to our own abilities



## Dunning-Kruger effect

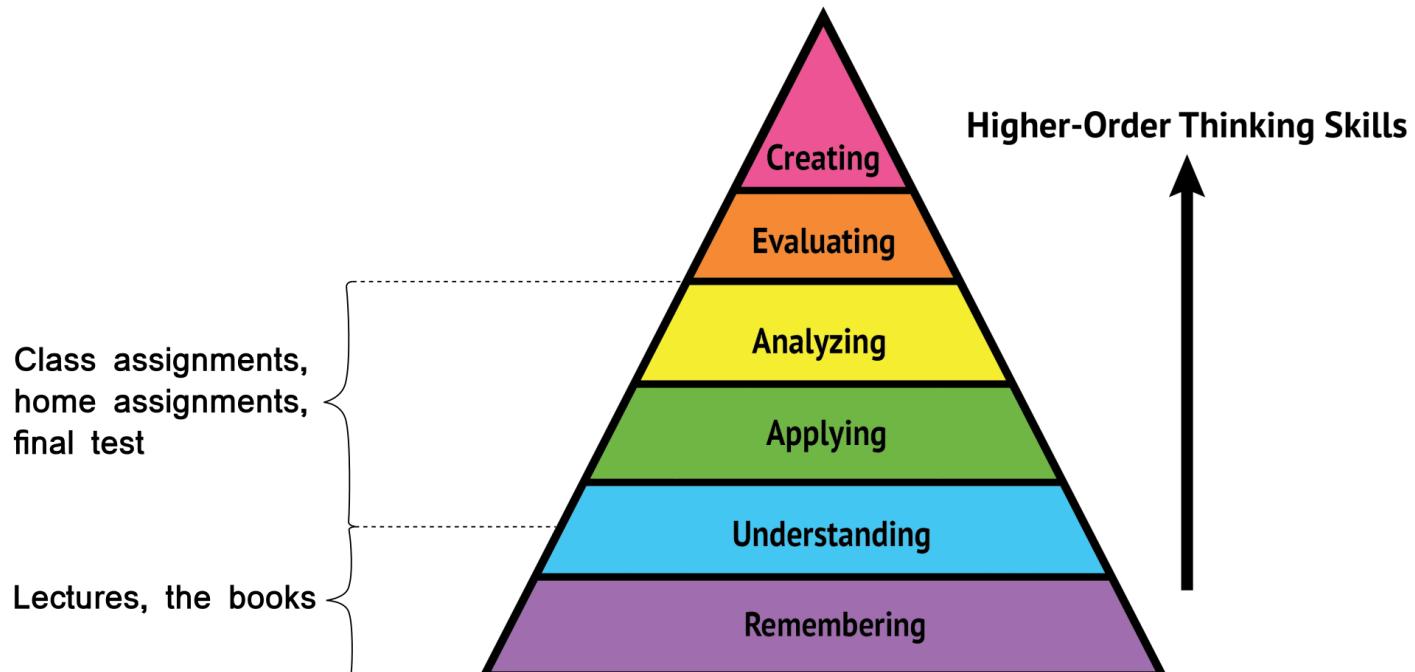
- Unskilled and unaware of it: why people fail to recognise their incompetence
- This course is technical, and it's ok
  - The best strategy is to acknowledge that you have something to learn
- If you are not failing, you are doing it wrong!
  - "A person who never made a mistake never tried anything new."

## Meta learning

- Learning how to learn
    - "Being aware of and taking control of one's own learning" - John Biggs
1. Planning
    - Selection of strategies
  2. Monitoring
    - Awareness of comprehension and task performance
  3. Evaluating
    - Appraising and correct strategies

You may have seen Bloom's taxonomy before.

The important point is that lower levels are prerequisite for higher levels but higher levels powerfully reinforce lower levels.



- Most importantly: learning is **not** free

## Meta learning example 1: Handwritten notes

- Your conceptual understanding increases when you take notes by hand
  - A study [on students and their note taking habits](https://www.scientificamerican.com/article/a-learning-secret-don-t-take-notes-with-a-laptop/) (<https://www.scientificamerican.com/article/a-learning-secret-don-t-take-notes-with-a-laptop/>)
- Cognitive processing improves when you interact physically

## Meta learning example 2: Avoid multitasking

- Brains are notoriously bad at multitasking
- Apparently **40%** of your time in class is spent on unrelated activities
  - Study on [affects of multitasking with laptops](https://eric.ed.gov/?id=EJ893903) (<https://eric.ed.gov/?id=EJ893903>)
- Take-away
  1. Exploit your tactile senses to take physical notes
  2. Have the self-discipline to shut down your laptop when we speak

# Metacognition

A [study on metacognition](https://phys.org/news/2017-10-metacognition-boosts-gen-chem-exam.html) (<https://phys.org/news/2017-10-metacognition-boosts-gen-chem-exam.html>) shows that teaching students about metacognition gives better grades:

"The students who are successful will ask themselves—what is this question asking me to do? How does that relate to what we're doing in class? Why are they giving me this question? If there's an equation, why does this equation work? That's the metacognitive part. If they will kick that in, they will see their grades go straight through the roof."

Charles Atwood

## Hacking your grades

- Be aware of how you think
  - How are you currently going about it? Is that the best way?
- **What** are you learning?
  - And how does that fit into the bigger picture? Why is it relevant?
- **How** are you learning?
  - Visual, auditory etc. (modalities)
  - Practical vs theoretical

## Summary

- We prepared a lot for you, and you will likely not find it easy
- You are human: fail fast
- This takes time. Seriously. Take. The. Time
- Think about how you think and learn
  - Is it smart to attend the lectures but never work on it by yourself?
  - Take notes!
  - (Hint: we won't be there to help you at the exam)

# Practicalities

- Everything can be found on:
  - LearnIT: <https://learnit.itu.dk/course/view.php?id=3019134> (<https://learnit.itu.dk/course/view.php?id=3019134>) or
  - GitHub: <https://github.com/itu-qsp/2019-summer> (<https://github.com/itu-qsp/2019-summer>)
- Mondays, Wednesdays and Fridays at 9:00 - 15:00
  - Assignments due for Tuesdays, Thursdays and Sundays
- 4 hours of common time
  - Switching between lecture and workshops
  - Please stay focused!
- 2 hours of exercises

## ITU formalia

Did you:

1. Take a photo for your student card?
2. Log on to the ITU wifi?
  - <http://go.itu.dk/eduroam-connected> (<http://go.itu.dk/eduroam-connected>)
  - **NOTE:** This is important for the final test
3. Login to <https://learnit.itu.dk> (<https://learnit.itu.dk>)

# An 82 year old can do it, so can you!

<https://www.aarp.org/work/working-at-50-plus/info-2018/worlds-oldest-app-developer-fd.html>  
[\(https://www.aarp.org/work/working-at-50-plus/info-2018/worlds-oldest-app-developer-fd.html\)](https://www.aarp.org/work/working-at-50-plus/info-2018/worlds-oldest-app-developer-fd.html)

