Final course presentations

What are you expected to do?

The marks

50% the presentation (on-line, and slides delivered in campus virtual)

50% an small summary (delivered in campus virtual)

How important it is for the final mark?

It will be 10% of the labs mark, which in turn is 60% of the total mark

Therefore it is 6% of the total mark or 0,6 points over 10

The presentation

10 minutes presentation

Will be cut if it gets over 10 minutes

0 to 5 minutes questions (from students and teacher)

Can be done in Catalan, Spanish or English

The summary

The summary must be Din A4 text document, in pdf (not slides)

It must summarize your findings and your understanding of the topic

No more than 3 Din A4 pages

Topic example

NVIDIA Deep Stream SDK: (what would I expect you to explain)

- What is this SDK designed for? Use cases.
  - Autonomous machines (drones, robots, industrial machines).
  - Surveillance systems and automatic alarms.
  - etc
- Which languages/API’s does it use or is compatible with?
  - C, C++, CUDA, Python, TensorFlow, Pytorch, ONNX...
- Which parallel technologies does it use (Software and Hardware)
  - CUDA for data parallelism, pThreads for task parallelism, TensorCores for fast convolutions, and specific accelerators for image processing, deep learning, and video encoding/decoding.
- Show examples of the previous 3 points: video, code, image...

Possible topics

- Parallel programming languages
  - CUDA (cuda graphs, cudaMallocAsync, Unified memory...)
  - MPI
  - OmpSS
  - Scala, Go routines (web or app backends)
  - C++ pthreads and new parallelism syntaxes
- Applications that extensively use parallelism
  - Protein folding
  - Fluid dynamics (aerospace design, cars, etc)
  - Trading and cryptocurrencies
  - Data bases (Spark CUDA based implementation)
  - Deep Learning

Possible topics

- Parallel hardware
  - Types of multicore CPU’s (Shared memory, NUMA, network on chip...)
  - Architectural details of GPU’s, from CUDA 1 to CUDA 11.
  - Comparison of GPU’s vs CPU’s.
  - Types of clusters for different use cases (High Performance Computing , app backends, big data...)
  - Specific purpose architectures:
    - GPU tensor cores.
    - Deep Learning accelerators (NVIDIA, Intel, others?).
    - Anton processor and other minoritary architectures.