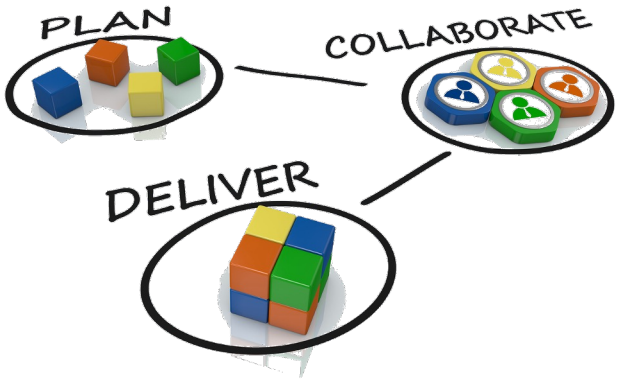
UNIVERSITÀ DEGLI STUDI DI MILANO BICOCCA

Laurea magistrale in Informatica

Final Project



Final Project (optional)

- The final project is worth 3 points
- Goal: creation of a cloud-native microservices application
  - You can propose a topic, but it must be approved
  - Groups of (preferably) 2 or (exceptionally) 3 people
    - Groups must be created using the widget that will be available on the elearning website
  - Questions and inquiries can be posed
    - By mail/forum
  - Delivery
    - Online, there will be a widget on the elearning website
    - Before 1-Feb-2023 (to meet the second ”appello”)

  - A live presentation of the application with slides and a demo must be scheduled in advance and before second “appello”

Requirements

- Open-source project
  - set up a git repository (github, gitlab, are ok. You can use them)
  - select a license (MIT, Apache 2.0, yes, why not?)

- Distributed
  - At least three REST microservices or at least two microservices and one FaaS
    - Want to explore GraphQL or gRPC? Very good, go ahead it is but **NOT REQUIRED**.
  - At least one external API must be used (there are several, weather, twitter, etc.)
  - At least two different databases (besides the microservices) – you can use one database if you choose to use a FaaS
    - Ex. MongoDB, MySQL
  - At least **one microservice pattern**

Requirements

- Cloud native
  - Each service must be containerized (both services and databases)
    - A dockerfile for each service must be provided
    - However, as for databases, ready-to-use containers can be exploited (no dockerfile required)
  - The full application must be deployable via Kubernetes
    - Application manifests in yml
    - At least one case of resource limitation
  - Deploy and run it on Kubernetes
    - You can use minikube in the virtual machine provided
    - Or you can use a cluster in a cloud provider (EKS on Amazon)
  - A CI/CD tool (for instance via GitLab or ARGO) for compilation and deployment
    - A short guide on how deploy on a virtual lab machine using GitLab will be provided

Very appreciated but not required

- The creation of a clear UX for the application
  - Built a fourth service/component to interact with the application
- The collaboration between two (or more) groups to deliver a richer system
  - Previous rules must be doubled up (6 services, 4 databases, 2 patterns)

Do you feel creative?

- In case you might want to propose a different project …
- or you feel fancy to do something different than microservices
  - like experimenting with Apache Airflow on Kubernetes
- Put yourself forward, come to talk to us!