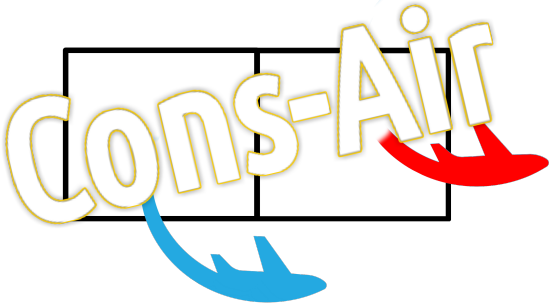
Group 4 present

Project Cons-Air Booking System:

Motherforking Threads On This Motherforking Plane



Operating systems and process oriented programming (1DT096)

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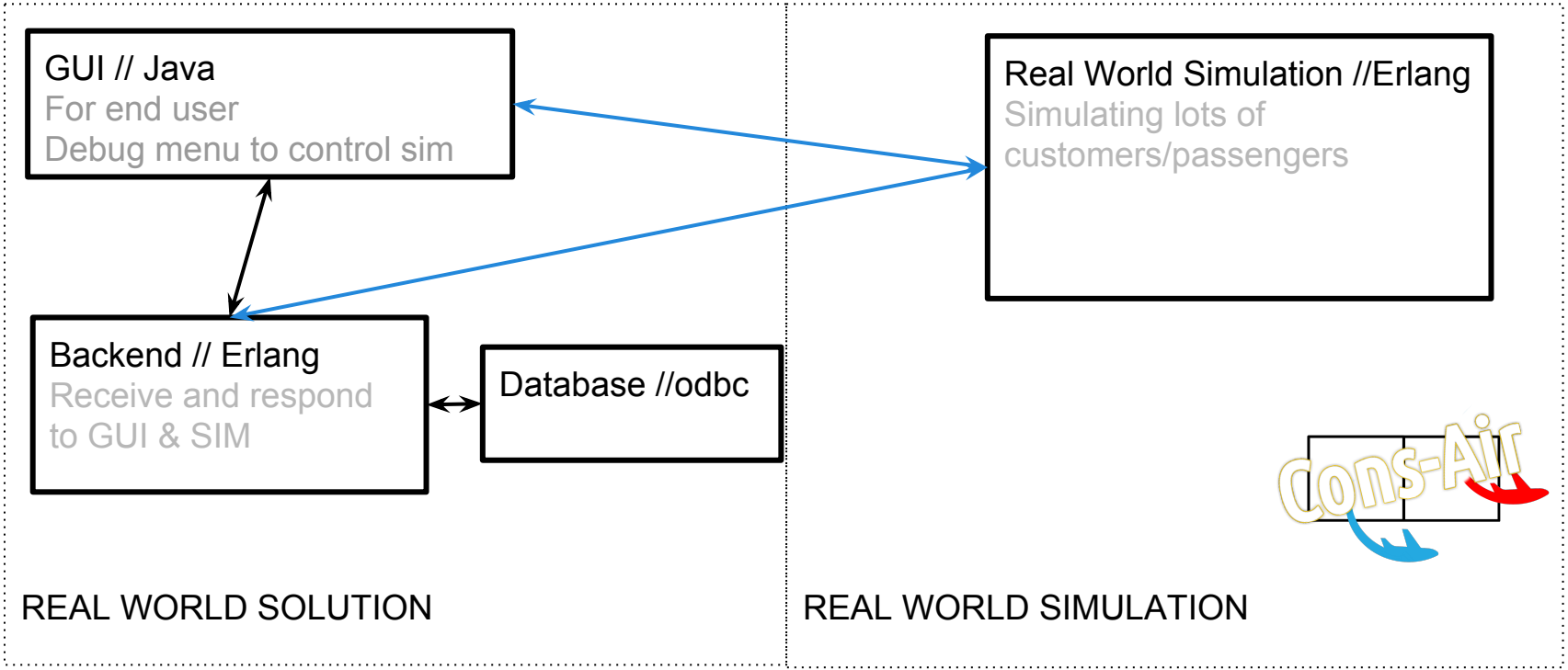
Airport Booking Service

- Solving the real life issue of thousands of passengers booking flights at the same time
- Creating a back-end which can handle a large simultaneous load
- Creating a front-end which is intuitive

General Project Architecture



General Project Architecture

REAL LIFE SIM // ERLANG

Simulation

- Lots of flights per day
- Lots of passengers trying to book simultaneously
- Potential extension: Connecting flights
- Potential extension: Disasters

Abstraction Layer

BACK END // ERLANG

Booking Database

- Concurrently handle passengers
- Flight Database
- Potential extension: Calculating possible transferring routes
- Potential extension: Disaster proofing and contingency planning

Abstraction Layer

FRONT END // JAVA

GUI

- Simple GUI for manual use of booking database
- Simulation Debug Menu

General Project Architecture

- Abstraction defined early in the project
- Focus on back-end and database, then move on to other parts

General Project Architecture

Multilingual communication

- Erlang and Java
  - Functional vs. Imperative
  - Java will call Erlang functions and receive answers
  - We will need to learn this

Concurrency

- Processes in Erlang
- Multithread in Java

Booking Database

- Concurrently handle passengers
- Efficiency and time complexity
- SQL, or other database solution
- PE: Disaster proofing
- PE: Encryption of sensitive payment data

GUI

- Java
- Cool and pretty
- Real time updates
  - Flight map, plane seating chart
- Debug menu
  - Real time updates of load and dev statistics

Simulation

Simulating the thousands of passengers

- Multi-process, one process for each passenger, trying frantically to book a flight.
  - Wants
    - Class preference
    - Seat preference
    - Groups (families, friends, sports teams?)
    - Sitting next to babies (Nobody wants that)
  - Needs
    - Destination
    - PE: Medical anomalies (wheelchairs, very long, too fat for one chair)

Simulation

Organizing the hundreds of airplanes

- A detailed schedule of incoming and outgoing planes
- Each plane has a destination and a group of passengers to ferry
- Actually a part of the Booking Program

HOWEVER

- PE: Late ingoing planes, late outgoing, snakes on a plane

Project Management and Work Structure

- Weekly update meetings
- Daily get-togethers
  - Working in group

    -> Less slacking

    -> Understanding what the others are doing (less of “just letting them solve their own problems”)
- Pairs
- Divide and Conquer
- Trello, Git, Google Docs and Overleaf

Goals

- Learn more in-depth erlang
- Multilingual programming
- Real life problem practice
- Project work as a team
- Learn more about group synergy

Tools

- Git
- Trello
- Erlang: Emacs/Vim, Java: IDE to be decided
- Erlang: EUnit, Java: jUnit, Simulation
- Make
- Documentation
  - Edoc
  - Javadoc

Challenges

- Multilingual communication
- Efficient multiprocessing
- Reliance under heavy load
- Work division and group management