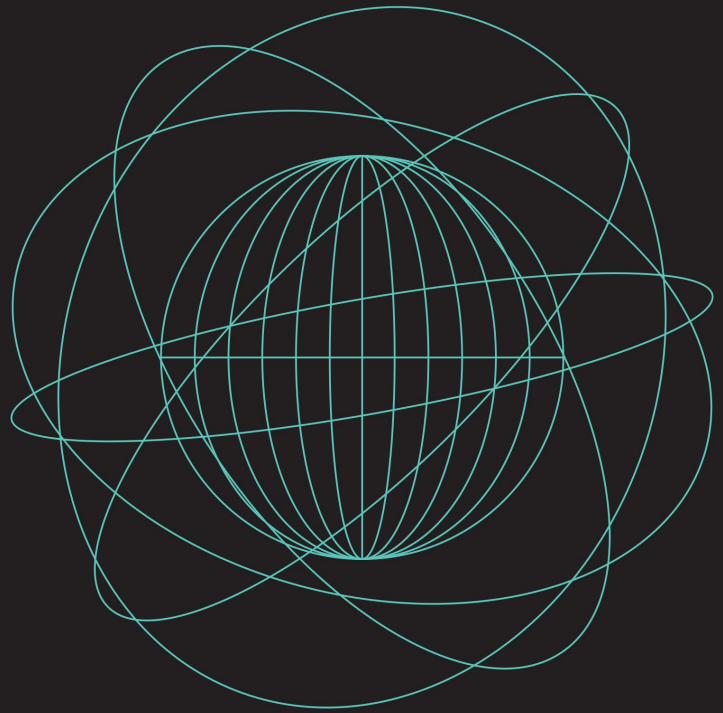
Unit8™ Full Data Journey Hackathon

Feb 18 - 20, 2022 **Zürich**



Introduction

We’re a Data & AI Services Provider

We’re enabling our customers to turn data into value.

- We are a **“one stop shop”** for **solving business problems via data**;
  We achieve this by using **AI** (incl. machine learning), **advanced analytics**, other **data science** methods and **custom software engineering**
- Our services include (big) **data & AI strategic advisory**, **end to end custom solutioning** and **data engineering/ infrastructure advisory** and **build up**
- Established in **2017** | **> 70 people** | **Offices** in **Zurich, Lausanne & Krakow**

banking
& insurance

pharma
& chemical

automotive
& aviation

industry 4.0

amazon web services | Partner Network
CONSULTING PARTNER

Gold Microsoft Partner
Microsoft

digitalswitzerland

swiss made software

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Who accompanies you through this journey?

Antoine
Data Scientist & Internal Projects Maestro

Background:
Masters in CS & ML

Maurice
Data Scientist & Cultural Ambassador

Background:
Masters in ML & DS

Gael
Sr. Data Scientist & Engagement Lead

Background:
Masters in CS and Signal Processing (xSwisscom)

Michal
Founder & CTO

Background:
Former Data Scientist & Tech Lead (xSwisscom, xPalantir)

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Agenda

Day	Time	Topic
Today	**15h30-16h00**	**Introduction to the hackathon, the organization and the challenge**
Today	**16h00-18h00**	Get familiar with the intranet, the data, the challenge and come up with a timeline
Today	**18h00-19h00**	Pre-sales presentations (you explain your approach and what you want to achieve) and clarifying questions in a private group meeting (20 min)
Today	**ca. 19h00-20h30**	Italian food & drinks at the cowork
Tomorrow	**ca. 09h00-19h00**	Dive-In into the challenge, try out approaches, visualizations etc. with the help of the Unit8 engineers
Tomorrow	**ca. 19h00-20h30**	Asian food & drinks at the cowork
Sunday	**ca. 09h00-15h00**	Dive-In into the challenge, prepare final presentation
Sunday	**15h00-16h40**	Final presentations, Q&A (15 min presentation + 5 min Q&A)
Sunday	**17h00-18h30**	Announcements of winners, distribution of prizes, wrap-up
Sunday	**18h30**	End of the event

All info you need for this weekend

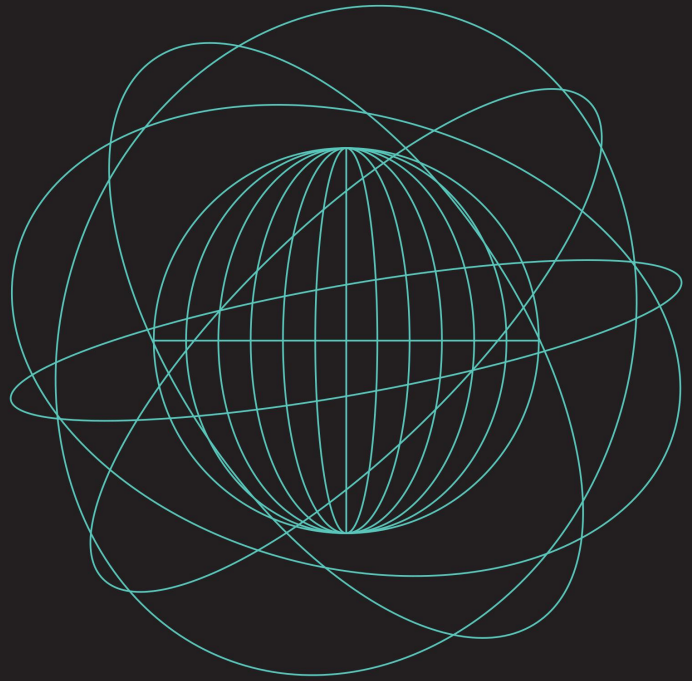
- COVID regulations
  - 2G duty
  - Always wear a mask inside the cowork, when you’re not drinking or eating

- Food & Drinks
  - Dinner (Fri + Sat), snacks, beer and soft drinks are **sponsored by Unit8**
  - We have a small kitchen on this floor with free tea and coffee
  - Special stuff and lunch can be bought at the train station or the Coop nearby

- Toilets
  - Outside the entrance on this floor, ring the bell to get back in

- Internet Access
  - **SSID**: Unit8 Hackathon
  - **PW**: Welcome2hack@unit8

The Challenge



Production Line Optimization for GAM Pharm

- Pharma Client that manufactures medical machinery on four **independent** production lines
- Each line has multiple unique modules and a single job has to pass through all modules of the line in chronological order
  - There are two buffers between two modules to temporarily store products
- In the beginning of each day, GAM Pharm knows exactly which jobs have to be processed by which production line until the end of the day

Goal

GAM Pharm wants to reduce the overall processing time of each individual line by finding the optimal order the given jobs should be processed.

*Have a **consultant** mindset! Beside solving the problem also think of how to sell/present your ideas, compensate the lack of CS knowledge of your client, come up with further ideas, insights and hypotheses and present these in your final presentation.*

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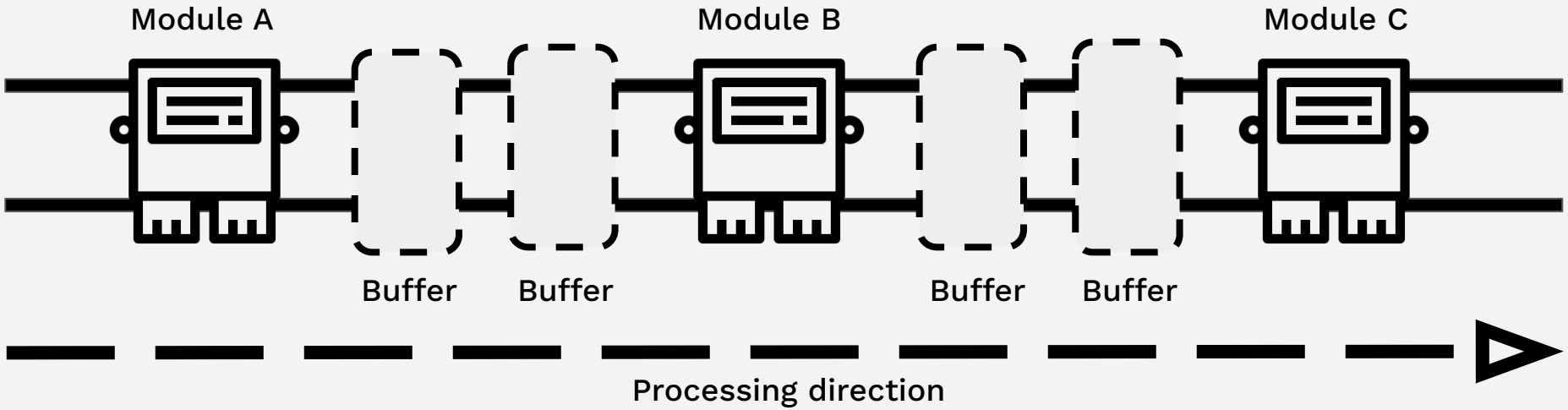
Production Line Example of GAM Pharm



Each job travels through each module and can NOT overtake another, preceding job.
However, the job can rest in one of the two buffer zones if
the subsequent module is still processing another job

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The data you're working with

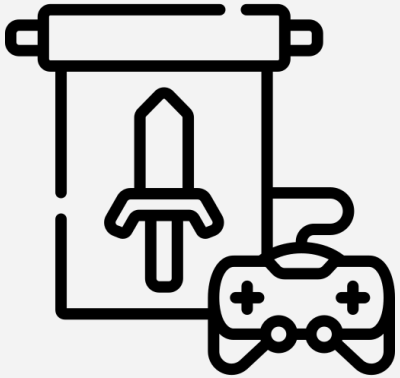
- You first receive a log file of a manufacturing day of all production lines with indicated timings of the different steps (processing, travelling, waiting) with a suboptimal ordering of the different jobs per line (the job_id is unique throughout all lines)
- Your target is to find out the best ordering of jobs per line such that the total processing time of each line is as low as possible

Every time you submit a job order, you will receive the processing times for each of the lines + a log file in the exact same format as the first log file presented here

	line	module	job_id	state	time
951	C	2	43	processing	2022-02-18T02:33:21.750000
381	B	4	37	storing_job	2022-02-18T17:18:58.159999
1037	C	7	45	fetching_job	2022-02-18T04:41:06.070000
1168	B	3	38	waiting_on_precedent	2022-02-18T16:40:56.579999
196	B	5	32	processing	2022-02-18T13:28:43.010000
840	C	6	62	storing_job	2022-02-18T09:36:47.009999
464	C	5	59	processing	2022-02-18T08:22:17.529999
831	C	4	52	storing_job	2022-02-18T06:07:56.770000
88	B	5	28	processing	2022-02-18T09:45:32.350000
513	C	2	52	storing_job	2022-02-18T05:46:15.980000

Side Challenges

- Various (secret and un-secret) side challenges will be activated throughout the event
- They are NOT directly linked to the main challenge of production line optimization, but will contribute to the final ranking of the Hackathon as well
- One side challenge called “AI 4 GOOD” will **not** contribute to the overall evaluation of the Hackathon but will have a special price for the winners ;)



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Evaluation Criteria

Unlike a usual hackathon where only the accuracy matters, we will also incorporate other factors, so be sure to prioritize correctly as you have multiple deliverables and ways to score medals:

- Main challenge (best time per production line)
- Side challenges (besides “AI 4 Good”)
- Your approach to the problem and how you worked as a group
- Final presentation

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Intranet Demo

How to get started

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How to call the API

- You can access the factory and run **20 calls** of the API **per hour**. This includes either calling the API to verify your result of a side challenge **OR** running the simulation of the production line to get the processing times per line + a log file, so be careful what you request ;)

Example of submission for the main challenge (Python):

```
submission = {"job_order": {"A": [2, 55, 12], "B": [1, 5, 8], "C": [9, 10], "D": [6, 11, 14]}}
response = requests.post('https://hackathon.unit8.com/api/submit',
                         headers={'Authorization': f'Token the_token_you_get_from_the_intranet',
                                  'Content-Type': 'application/json'},
                         json=submission)
```

Example of submission for a side challenge (Python):

```
submission_side_challenge = {"challenge_id": 7, "submission": "Genius is one percent inspiration
and ninety-nine percent perspiration."}
response = requests.post('https://hackathon.unit8.com/api/submit',
                          headers={'Authorization': f'Token the_token_you_get_from_the_intranet',
                                   'Content-Type': 'application/json'},
                          json=submission_side_challenge)
```

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Your Teams

Backstreet Bayes	Eiger	EZC	hackBAr	SuSpense
Ken Geeler Pascal Bühler Marco Henriques Pereira Flavio Eisenring	Guga Gogia Siddhant Sahu Yu Hoeun Jasmine Dusan Svilarkovic	Cakir Beyeler Thomas Good Tenzin Langdun Martin Oswald	Erman Zankov Jari Rentsch Samuel Stalder Sydney Nguyen	David Kern Yvo Spielmann Jeremiah Agboola Matteo Rocco
Pre-Sales: 18:00 w/ Antoine	**Pre-Sales:** 18:20 w/ Antoine	**Pre-Sales:** 18:20 w/ Maurice	**Pre-Sales:** 18:00 w/ Maurice	**Pre-Sales:** 18:40 w/ Antoine

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Keep in mind:

We are here to help you!
At Unit8, one of our core values is to value teamwork over individual contribution.

Approach us with any kinds of questions or requests you may have at any point in time!