FinQ Case Study #1

Aircraft Loading Optimization

Orientation Meeting
2021-10-16

Purpose

- Hands-on experience – learning by doing
- Bridging the gap between academic research and industry applications
- Teamwork and connections

Schedule

- **October 16, 2021:** Orientation / kick-off
- **Week 1-2:** Reading materials, Q&A
- **Week 3-4:** Implementation & iteration
- **Week 5-6:** Brainstorming & adding features
- **Week 7-8:** Review & report composing
- **Office hours** at the end of each 2-week session
- **December 11, 2021:** Final presentation
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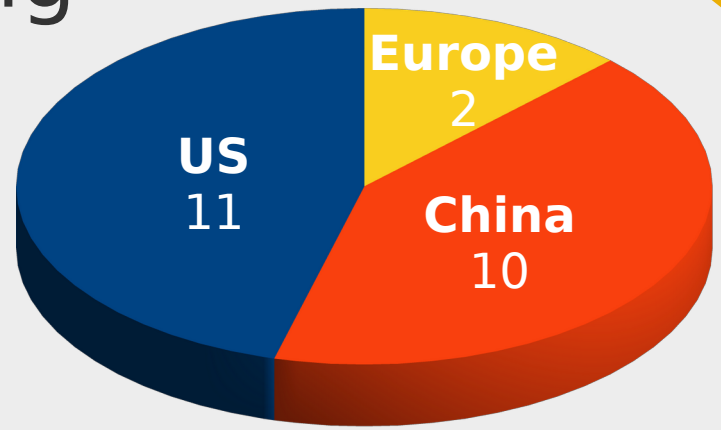
Grouping



- 23 Participants
- 7 groups
  - 3 to 4 members per group
  - 1 group leader per group
- 2 greater groups
- All groups are expected to have their solutions
- Inter-group collaborations are welcome!

Grouping

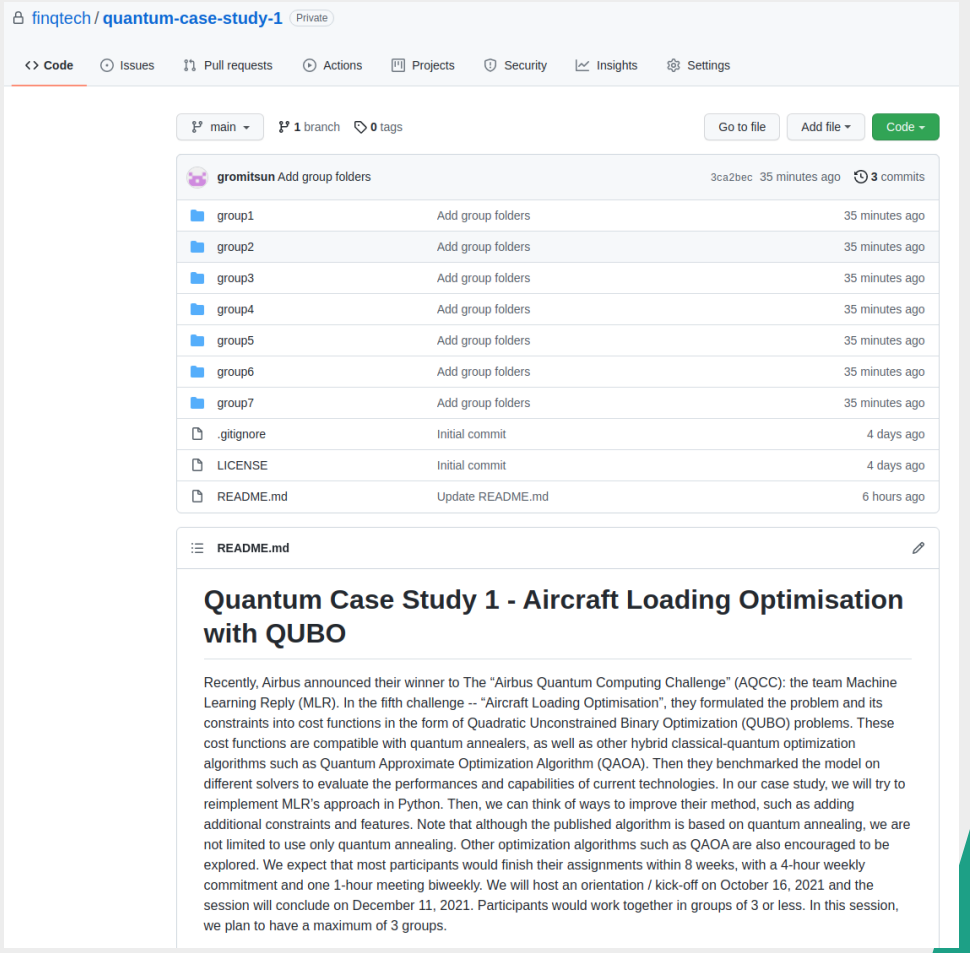
地理位置国家和地区	称呼	微信昵称	微信ID	Group
美国	**Mao Lin**	**Lin Mao**	**fagdfagdfagd**	**1**
美国	Ke	superhead	4044569	1
美国	Yiwen	Even	yiwentoughguy	1
德国	Martin	Iceeee	SloveNat	2
瑞士	于乐宾	于乐宾	NibelYU	2
中国	丁齐鸣	Curry	ding13to14	2
中国	赵乾坤	Jason Mendel	M_Messi_Z	3
中国	金狮楠	nautilus	nautilus	3
中国	Hao	H	keepdadreams	3
美国	Jack Song	QResource_Unknow	kaminotesf524	4
中国	赵翔	赵翔	magelead	4
美国	敖敖	宴之敖	skkkkrrr	4
美国	**Meng**	**华梦**	**华梦**	**5**
中国	李祺	Richard	582938827	5
中国	James Xu	James X	smiles_2012	5
美国	效骁	xx	xx13791379	5
美国	许文超	许文超	409562878	6
中国	archwxw	王新文	archwxw	6
美国	Li Zeng	Li Zeng	wxid_xvao7v18o55n	6
美国	明	明	Keduo003	7
中国	Mark	Mark	themengmeng	7
中国	宇航员	宇航员Samura	宇航员Samura	7
美国	Shawn	夜行锦衣	xiangli61	7

- Greater group leader in **bold**
- Group leader in highlight

GitHub Repo

- We have a private GitHub repo:

finqtech/quantum-case-study-1

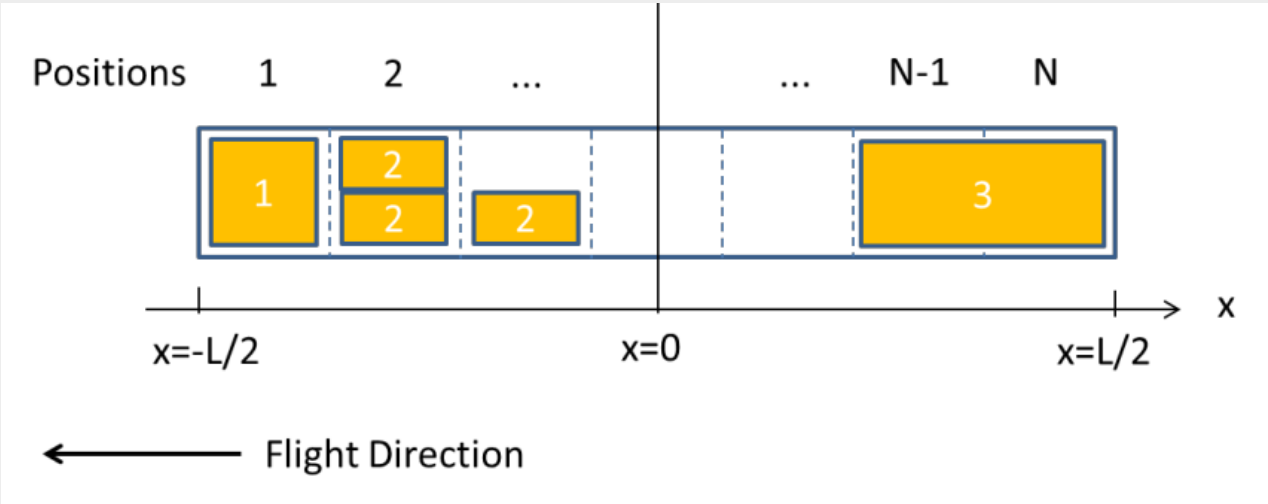


Evaluation and Awards

- All groups will be evaluated after all final presentations.
- Top groups will be awarded a **prize**.

The Problem

- Aircraft loading optimization



Objectives

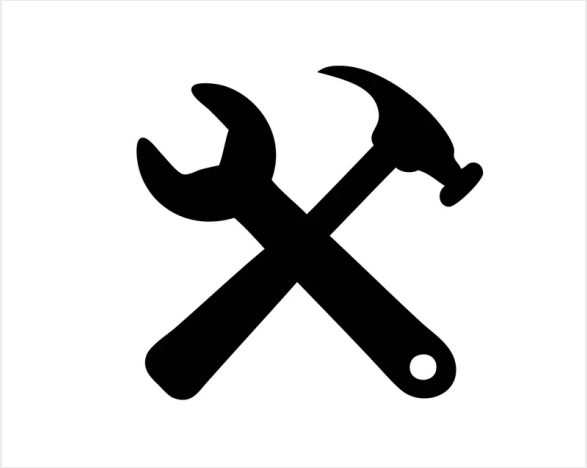
- Total mass (primary)
- Center of gravity (secondary)

Constraints

- Payload
- Center of gravity limit
- Shear limit

Suggested Tools

- Algorithms
  - QAOA
  - VQE
  - Quantum Annealing
- Implementation
  - Python – NumPy / SciPy
  - Qiskit / cirq / pennylane



Questions?

Let’s have fun
learning together!