

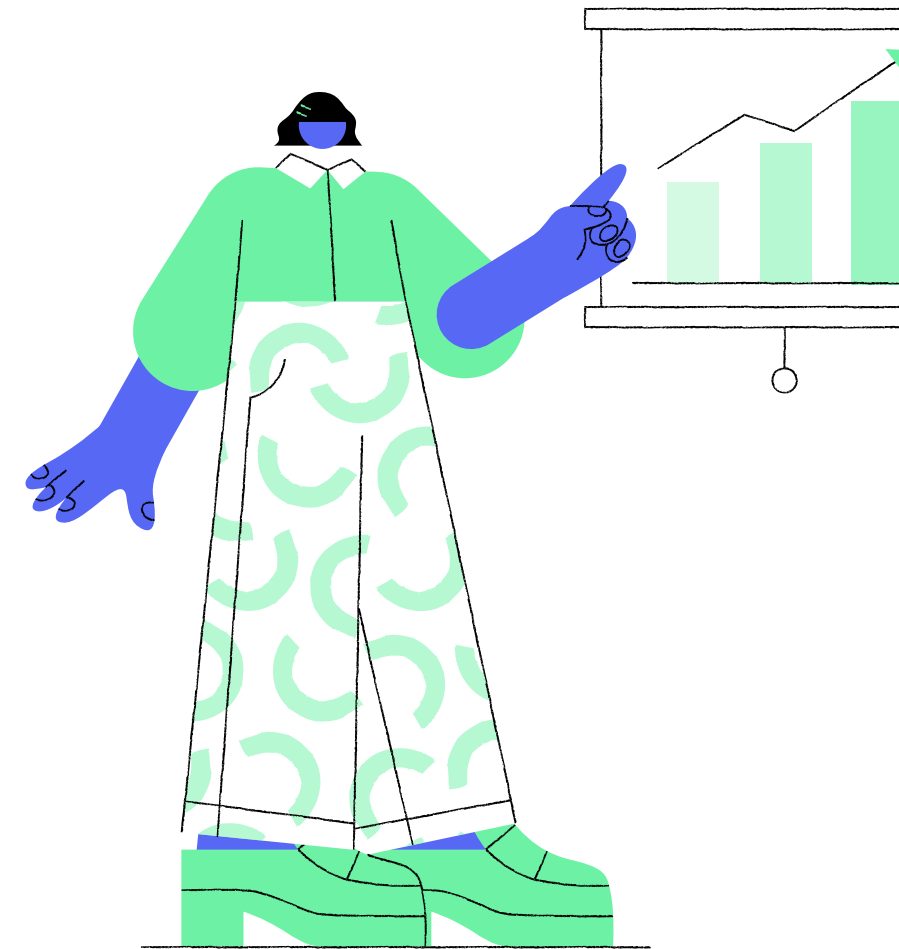
Team Building Camp

Jesal Pancham
Maria Fernanda Pernillo
Mariana Salazar
Tuty Chau

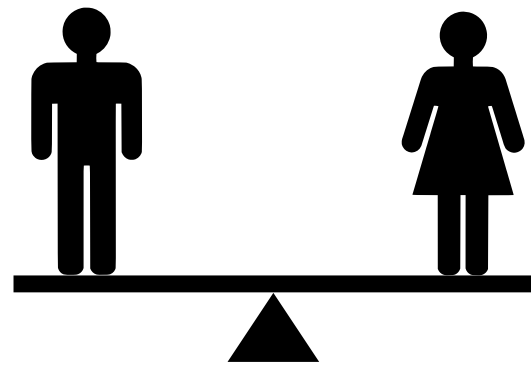


BUSINESS PROBLEM

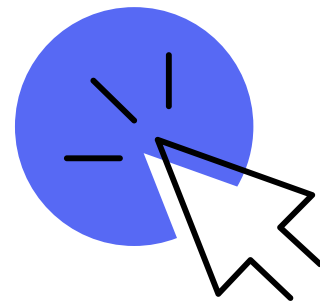
To ensure the 25 teams of 4 participants each meet all or most of the following criteria, in order to maximize the benefits of the exercises planned during the retreat.



CONSTRAINTS



Gender



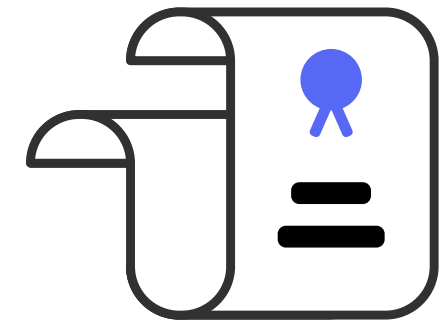
Department



**Years of
experience**



Nationality



Title

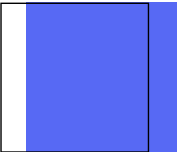
GENDER



Population average in gender
representation



DEPARTMENT



21

Departments

Each team should not have more than 1 person from the same department.



EXPERIENCE

16 years

Population
average

the team average experience should be as close to the
population average

NATIONALITY

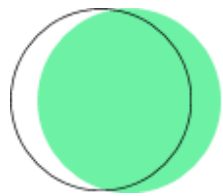


56

Different
nationalities

Team should not have more than 1 person from the same
nationality

TITLE



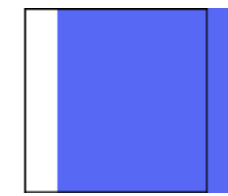
MANAGER

14



SENIOR

55



JUNIOR

31

SIMULATION

01

1 MILLION OF SIMULATIONS

02

NORMALIZED

	Gender Penalty	Nationality Penalty	Department Penalty	Experience Penalty	Title Penalty	Total Penalties
count	1000000.000000	953456.000000	999234.000000	1000000.000000	1000000.000000	952738.000000
mean	1.821756	4.931587	4.940260	36.252724	9.526531	57.465454
std	0.692964	0.988175	1.249729	6.949560	0.948618	7.234132
min	0.251269	1.489161	0.499600	11.102222	5.500000	28.735021
25%	1.399177	4.611984	4.198285	31.371227	9.000000	52.413725
50%	1.882122	4.765879	4.909745	35.917811	9.500000	57.144182
75%	2.381902	5.199385	5.552081	40.746981	10.000000	62.161824
max	3.751446	11.777945	12.852766	73.380849	14.000000	97.336482

RESULTS FROM SIMULATIONS

1 Million simulations

	Gender Penalty	Nationality Penalty	Department Penalty	Experience Penalty	Title Penalty	Total Loss
count	1000000.000000	1000000.000000	1000000.000000	1000000.000000	1000000.000000	1000000.000000
mean	4.842844	2.706118	6.552775	99.540364	0.761544	114.403645
std	0.766067	1.478260	2.343364	13.608317	0.595620	13.972521
min	1.760000	0.000000	0.000000	31.590000	0.000000	52.730000
25%	4.460000	2.000000	5.000000	90.230000	0.000000	104.850000
50%	4.900000	3.000000	6.000000	99.410000	1.000000	114.250000
75%	5.400000	4.000000	8.000000	108.730000	1.000000	123.790000
max	8.840000	12.000000	21.000000	163.590000	2.000000	182.350000



SIMULATION WITH PRIORITIZATION

Without prioritizing

	Teams	Gender Penalty	Nationality Penalty	Department Penalty	Experience Penalty	Title Penalty	Total Loss
251435	[[63, 23, 79, 32], [54, 55, 86, 96], [8, 82, 9...	4.96	3	2	42.77	0	52.73
647118	[[61, 91, 94, 79], [18, 59, 63, 46], [78, 99, ...	4.84	1	6	42.09	0	53.93
148190	[[59, 47, 27, 12], [65, 8, 44, 83], [30, 38, 7...	4.40	2	5	42.73	0	54.13
427206	[[79, 7, 82, 36], [24, 17, 43, 13], [45, 37, 2...	4.96	4	13	31.59	1	54.55
388197	[[5, 97, 9, 20], [89, 66, 96, 82], [15, 68, 73...	4.02	0	8	43.23	0	55.25

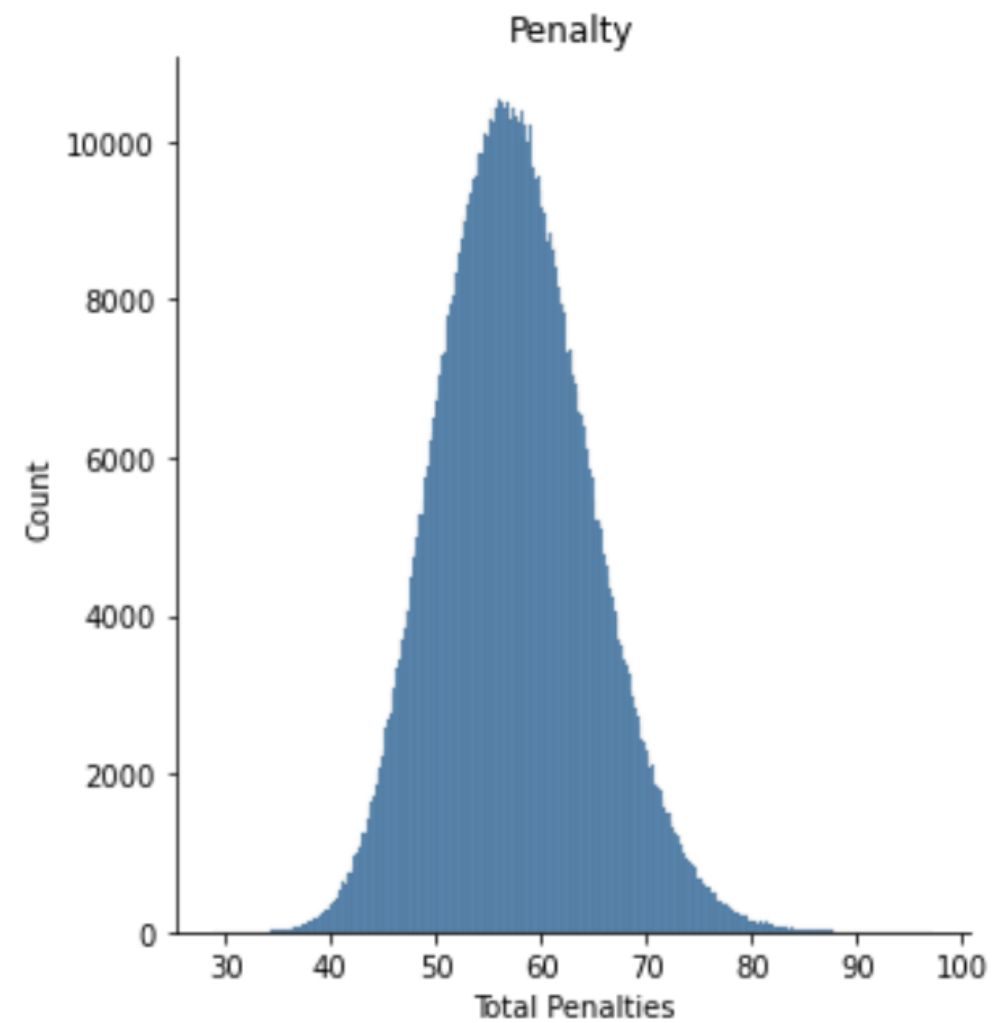
Prioritizing years of experience 3, Department 2

	Teams	Gender Penalty	Nationality Penalty	Department Penalty	Experience Penalty	Title Penalty	Total Loss
846728	[[64, 59, 24, 67], [17, 51, 66, 42], [99, 20, ...	3.58	4	5	120.81	1	134.39
531480	[[43, 79, 94, 70], [41, 90, 81, 6], [62, 84, 1...	4.46	2	8	122.85	0	137.31
902934	[[56, 23, 28, 39], [45, 4, 66, 83], [88, 17, 2...	5.40	3	6	123.27	0	137.67
434064	[[71, 33, 18, 10], [86, 79, 82, 56], [66, 19, ...	4.46	2	6	133.11	1	146.57
978575	[[65, 53, 41, 61], [15, 35, 75, 70], [4, 97, 8...	4.90	6	3	133.23	0	147.13

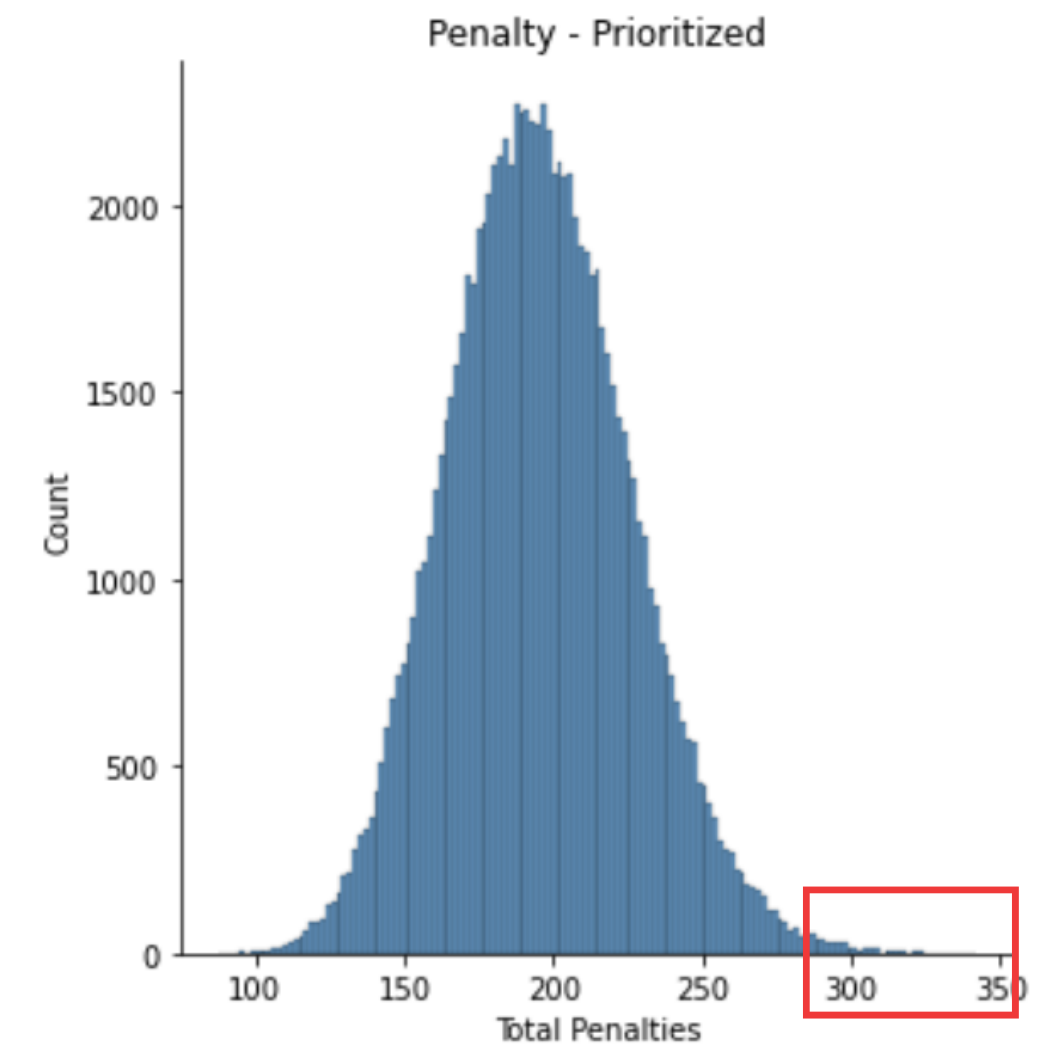


DISTRIBUTION OF PENALTIES

Without prioritizing



Prioritizing:
Years of experience and Department



OUTLIERS

TEAMS OUTPUT

TOP 5

	Teams	Gender	Nationality	Department	Experience	Title	Per Team
10	[74, 98, 77, 47]	[Male, Female, Male, Male]	[Peru, United Kingdom, Qatar, India]	[Security, Budgeting, Payroll, Supply Chain]	[13, 32, 19, 1]	[Senior, Manager, Senior, Junior]	5.49
0	[82, 13, 99, 11]	[Female, Female, Female, Male]	[Russia, China, Vietnam, Chile]	[Auditing, Advertising, Training, Benefits]	[31, 12, 10, 7]	[Manager, Senior, Junior, Junior]	6.74
13	[26, 66, 58, 17]	[Female, Female, Male, Male]	[Ethiopia, Myanmar, Kuwait, Costa Rica]	[Employee Relations, Customer Service, Custome...]	[9, 0, 33, 22]	[Junior, Junior, Manager, Senior]	6.74
24	[32, 50, 29, 21]	[Female, Male, Male, Male]	[Ghana, Iraq, Finland, Denmark]	[Customer Service, Development, Recruitment, F...]	[16, 23, 1, 34]	[Senior, Senior, Junior, Manager]	7.56
11	[97, 78, 94, 70]	[Female, Male, Male, Female]	[United Arab Emirates, Qatar, Tanzania, Panama]	[Supply Chain, Quality Control, Benefits, Deve...]	[2, 24, 12, 22]	[Junior, Senior, Senior, Senior]	7.74

WORST 5

	Teams	Gender	Nationality	Department	Experience	Title	Per Team
12	[76, 87, 67, 15]	[Female, Male, Female, Female]	[Poland, Singapore, Nigeria, China]	[Supply Chain, Benefits, Development, Infrastr...]	[21, 20, 23, 47]	[Senior, Senior, Senior, Manager]	17.81
3	[51, 10, 61, 39]	[Male, Female, Male, Male]	[Iraq, Brazil, Lithuania, India]	[Facilities, Payroll, Presales, Collections]	[3, 13, 3, 8]	[Junior, Senior, Junior, Junior]	15.99
16	[48, 57, 2, 64]	[Male, Female, Male, Male]	[Iran, Kenya, Algeria, Mexico]	[Customer Service, Retail, Finance, Payroll]	[6, 5, 16, 2]	[Junior, Junior, Senior, Junior]	15.49
7	[27, 36, 42, 41]	[Male, Male, Male, Female]	[Ethiopia, Guatemala, India, India]	[Retail, Customer Service, Employee Relations,...]	[15, 22, 26, 31]	[Senior, Senior, Senior, Manager]	14.56
5	[69, 23, 71, 83]	[Female, Female, Male, Female]	[Pakistan, Ecuador, Panama, Russia]	[Recruitment, Benefits, Training, Training]	[18, 5, 1, 13]	[Senior, Junior, Junior, Senior]	14.49

➤ CONCLUSIONS

- We learned about handling constraints in a real world problem that we actually lived through.
- We now understand that prioritizing is a necessity. It is hard to encounter everyday problems with binding constraints. There is a bigger possibility that we will have to work around many non-binding constraints and figure out which one is more important.
- Thinking is the key. We learnt that we cannot tackle a problem as a whole. It is better to break it down. Make sure it runs correctly at a smaller scale and then move on to slowly but surely increasing the scale to reach our end goal.
- Visualizations are SO helpful. For our preliminary presentation, we decided not to include graphs. After seeing what other teams had worked on and the way they approached the problem, understanding that there is a limit to the problem we were trying to tackle by looking at how it exponentially grew with the scatterplot, was eye opening.
- Coding on real problems takes time. It is not as systematic as taught in class. Sometimes we will not have a “correct” answer. That’s why we need to practice thinking, more than practice coding. Coding solutions can be found, after you’re confident in your thinking skills.