AIRLINE PLANNING ALGORITHM

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Problem 0: IP vs PDDL vs RL

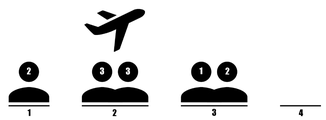

Fig. 1: P0-1

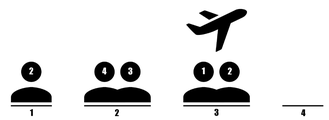

Fig. 2: P0-2

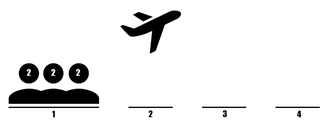

Fig. 3: P0-3

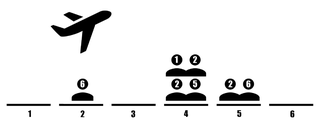

Fig. 4: P0-4

Tab. 1: Score (people dest. - flight cost)

Score	IP	PDDL	RI
P0-1	1	**2**	**2**
P0-2	0	**1**	**1**
P0-3	**1**	**1**	**1**
P0-4	N/A	**1**	**1**

Tab. 2: Iterations

Iterations	IP	PDDL	RI
P0-1	1794	11647	**6**
P0-2	45	46349	**8**
P0-3	1422	544	**16**
P0-4	Constrain Limit	11872177	**37**

Problem 1: PDDL vs RL

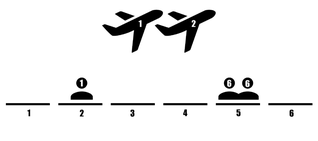

Fig. 5: P1-1

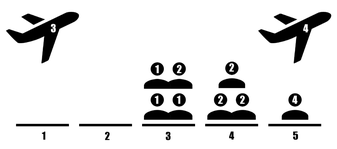

Fig. 6: P1-2

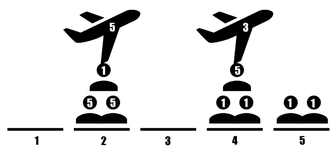

Fig. 7: P1-3

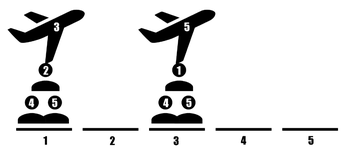

Fig. 8: P1-4

Tab. 3: Score (people dest. - flight cost)

Score	PDDL	RL
P1-1	-1	**0**
P1-2	**3** (with grouping)	2
P1-3	**5** (with grouping)	3
P1-4	OutOfMemory	**0**

Tab. 4: Iterations

Score	PDDL	RL
P1-1	16816	**5087**
P1-2	118215	**3997**
P1-3	2189489	**9185**
P1-4	OutOfMemory	**7555**

Note: This experiment has also been done employing distance between cities.

Problem 2: RL

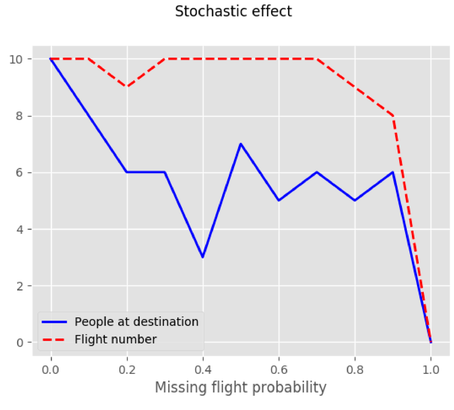

Fig. 9: P1-1

We added a probability of a person missing a flight. Results show:

- With low missing probabilities, the RL agent is able to perform at the same level.
- With middle range probabilities, the agent continues doing the same number of flights, though bringing less passengers.
- With high probabilities, the agent realizes its better not to move any plane.