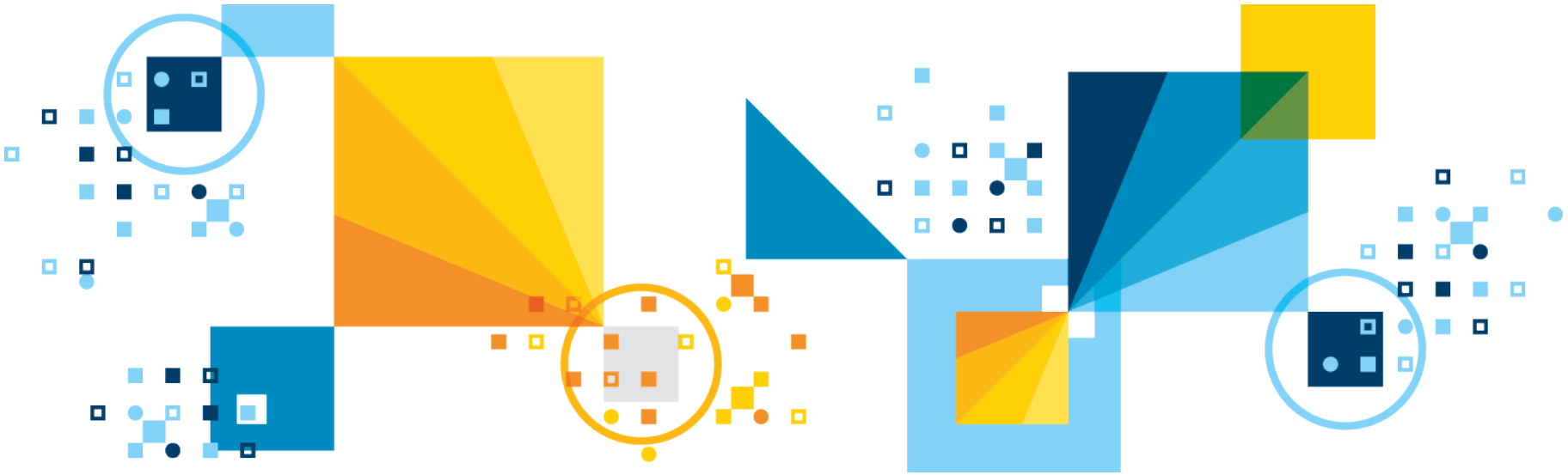
Sumeet Parashar, Technical Specialist – IBM Data Science and Decision Optimization

Oil Blend Optimization (Maximize Oil Company Profit)



Content

- Sample problem notebook – Oil Production
- Other DO+DSX examples –
  - Coffee Shop selection – notebook with maps
  - Ambulance placement – R studio Shiny app
- DODS – Decision Optimization in Data Science – Beta preview

Problem Statement

Given: Oil company manufactures different types of gasoline and diesel by blending different types of crude oils

Gas Data

name	demand	price	octane	lead
super	3000	70	10	1
regular	2000	60	8	2
diesel	1000	50	6	1

Oil Data

name	capacity	price	octane	lead
crude1	5000	45	12	0.5
crude2	5000	35	6	2.0
crude3	5000	25	8	3.0

Objective: maximize profit.
Decide: decide how much crude oil to buy

	Super	Regular	Diesel
Crude 1	x	x	x
Crude 2	x	x	x
Crude 3	x	x	x

Constraints:

- Meet demand; Octane level; Lead restrictions
- Company can only purchase 5,000 barrels of each type of crude oil per day
- Company can process at most 14,000 barrels a day.

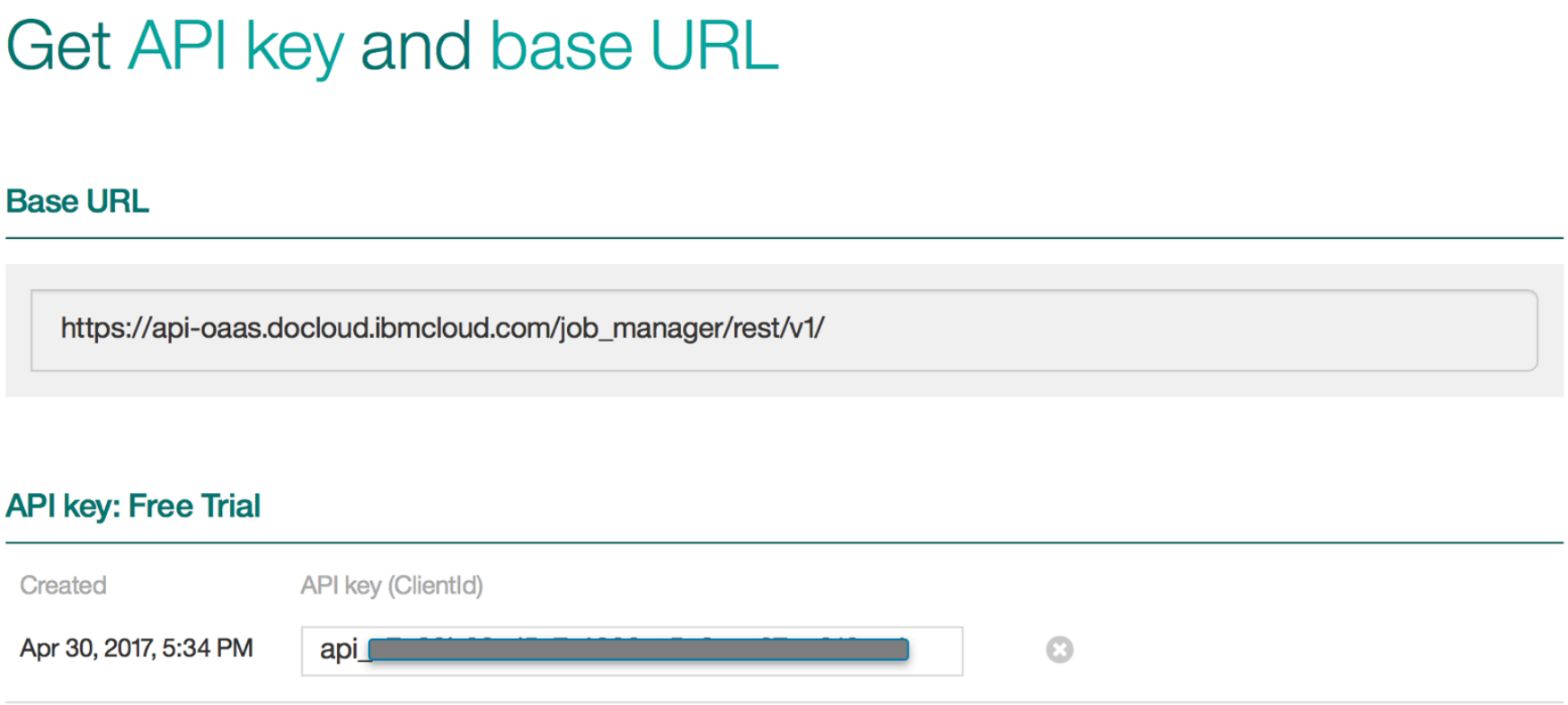
Problem Statement

Additional Variables and Constraints:

- The company has the option of advertising a gasoline, which increases the demand for this type of gasoline by ten barrels for every dollar spent.

- Decision Variable: How much to spend on each product promotion

DOcplexCloud: url and API key



Helpful links

- Sample problem notebook – GitHub link
https://github.com/sumeetparashar/IBM-Decision-Optimization-Introductory-notebook/blob/master/Oil-blend-student-copy.ipynb

- DOcplex Python API documentation
https://cdn.rawgit.com/IBMDecisionOptimization/docplex-doc/master/docs/index.html

- Creating a MP model in a nutshell
https://cdn.rawgit.com/IBMDecisionOptimization/docplex-doc/master/docs/mp/creating_model.html