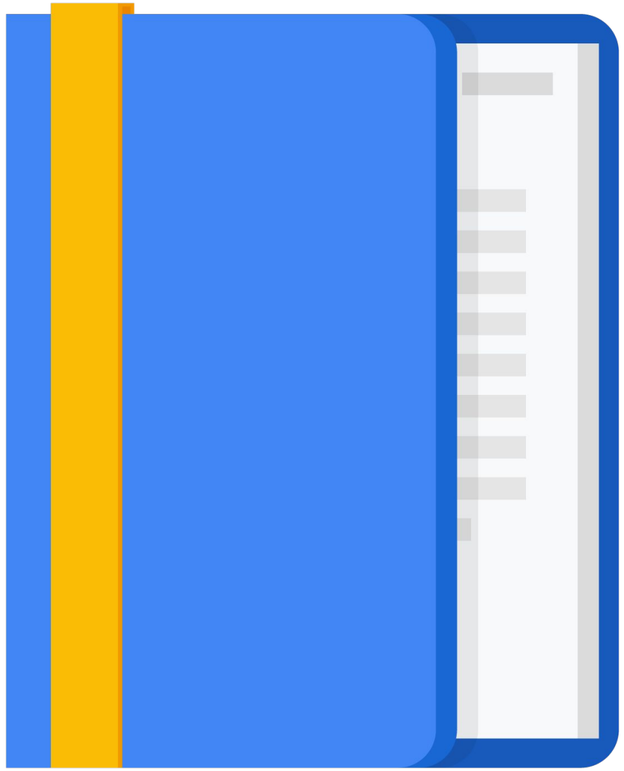
Google Cloud

Big Data Analytics with Cloud AI Platform Notebooks

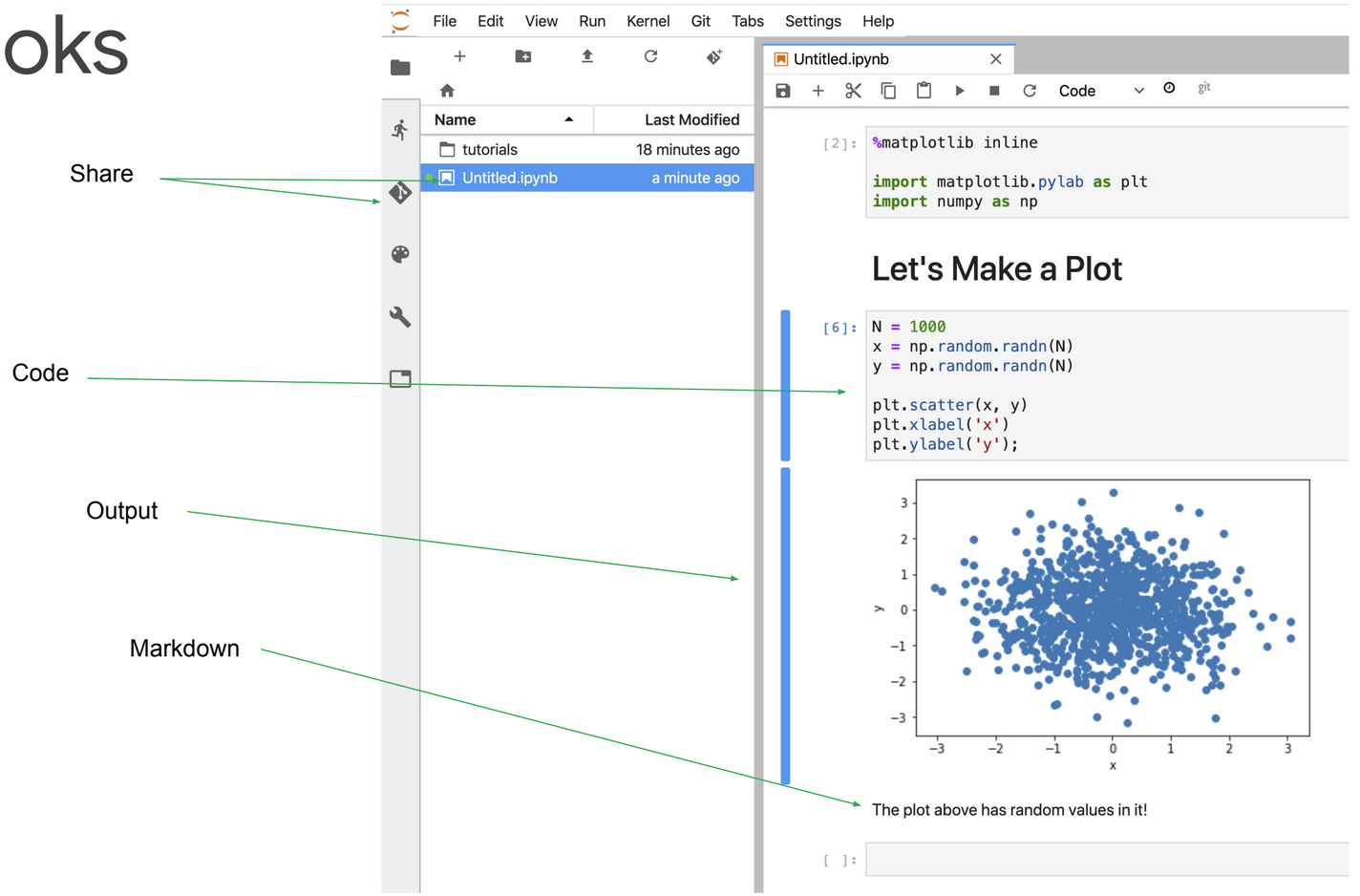
Agenda

What's a Notebook

BigQuery Magic and Ties to Pandas



Increasingly, data analysis and machine learning are carried out in self-descriptive, shareable, executable notebooks



A typical notebook contains code, charts, and explanations

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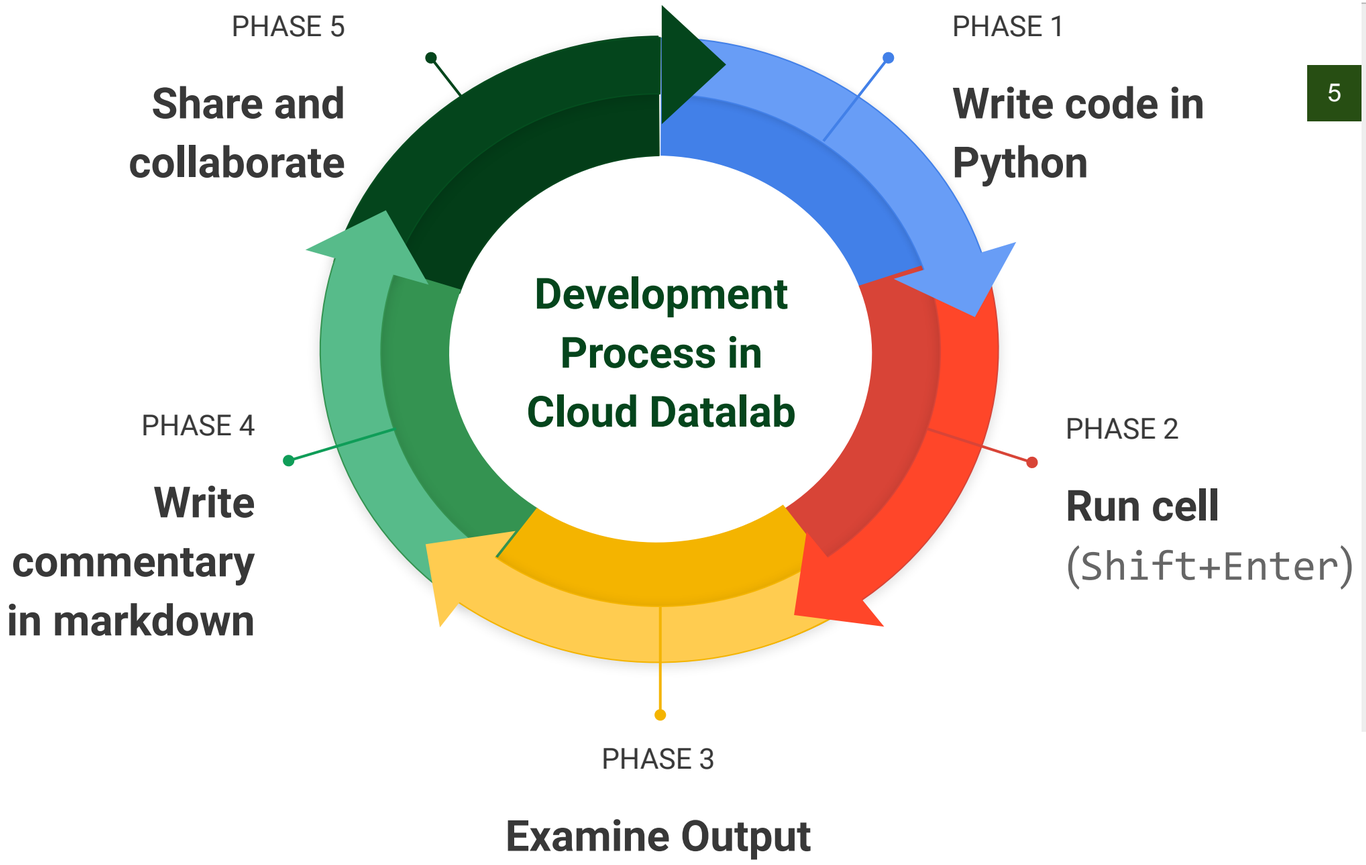
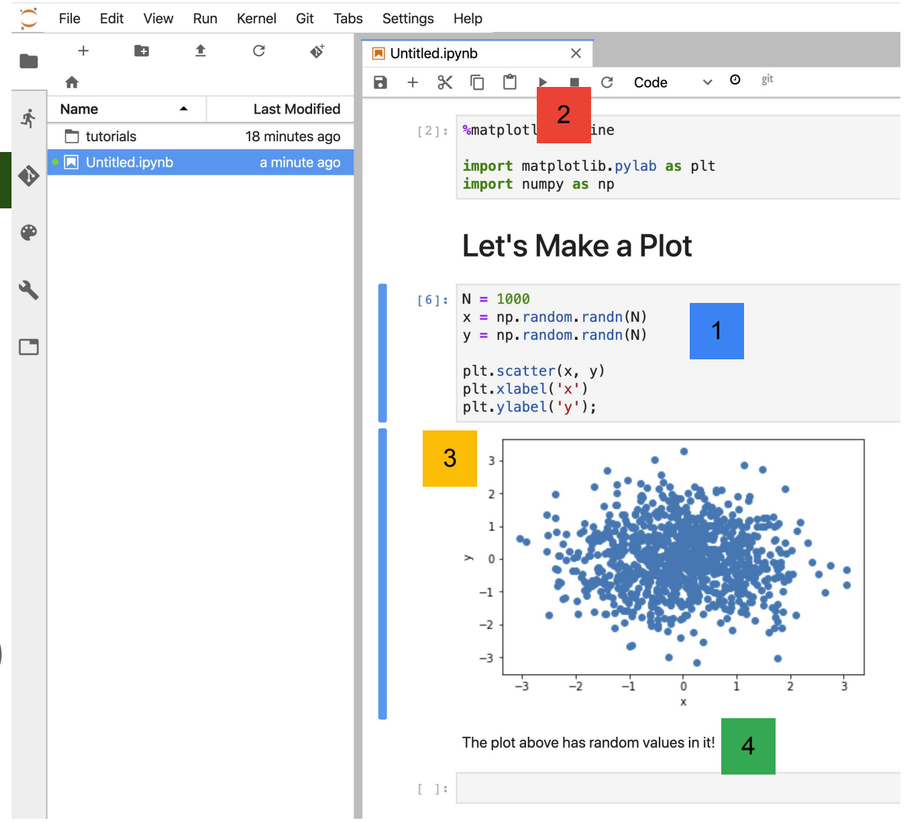
Notebooks are developed in an iterative, collaborative process





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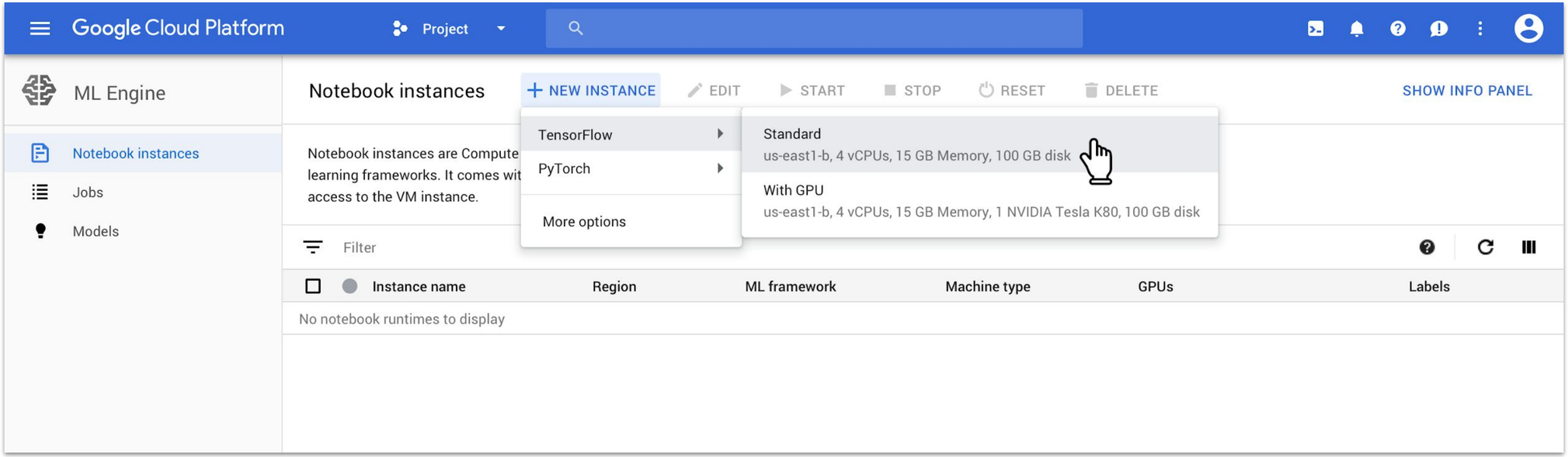
Spin up a JuypterLab instance, pre-configured with the latest machine learning and data science frameworks in one click.



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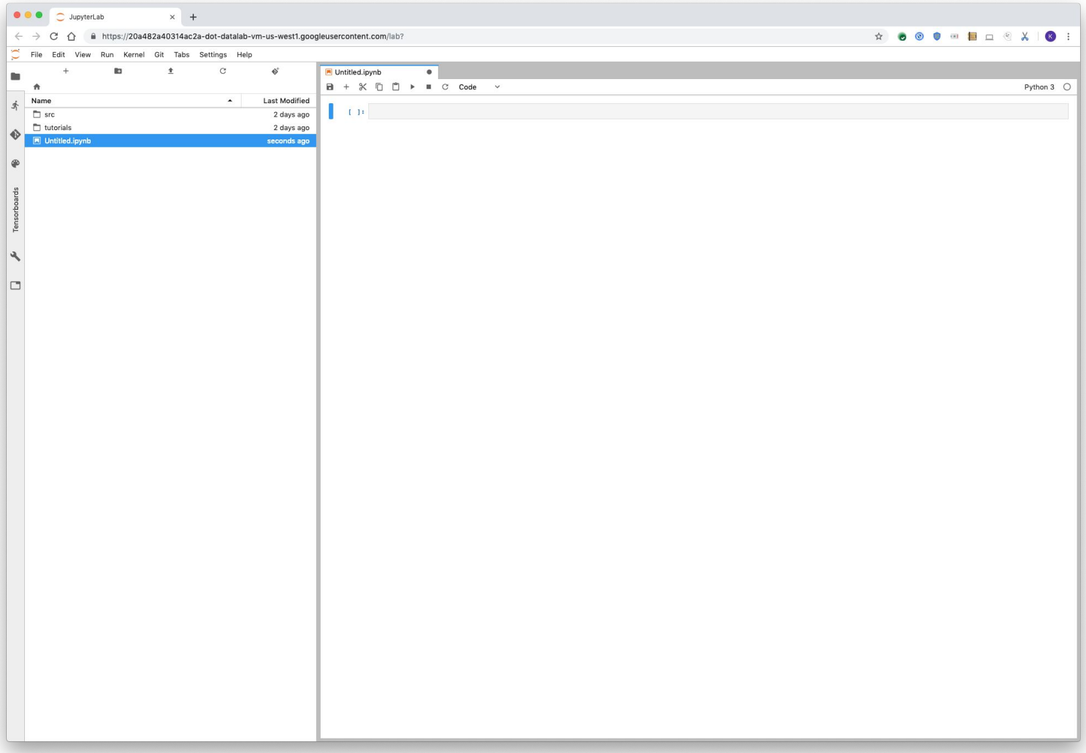
AI Platform Notebooks uses the latest open-source version of the industry-standard JupyterLab



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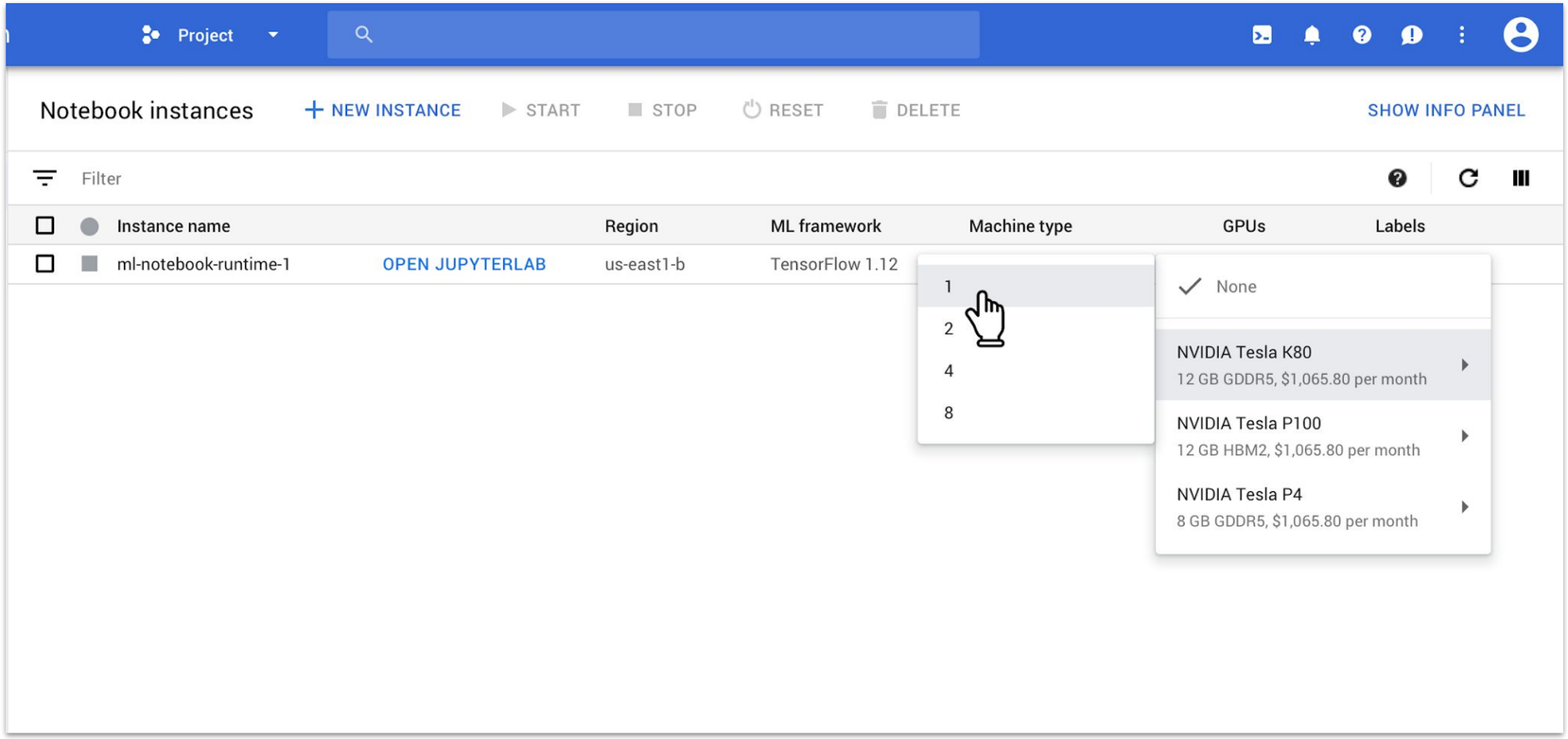
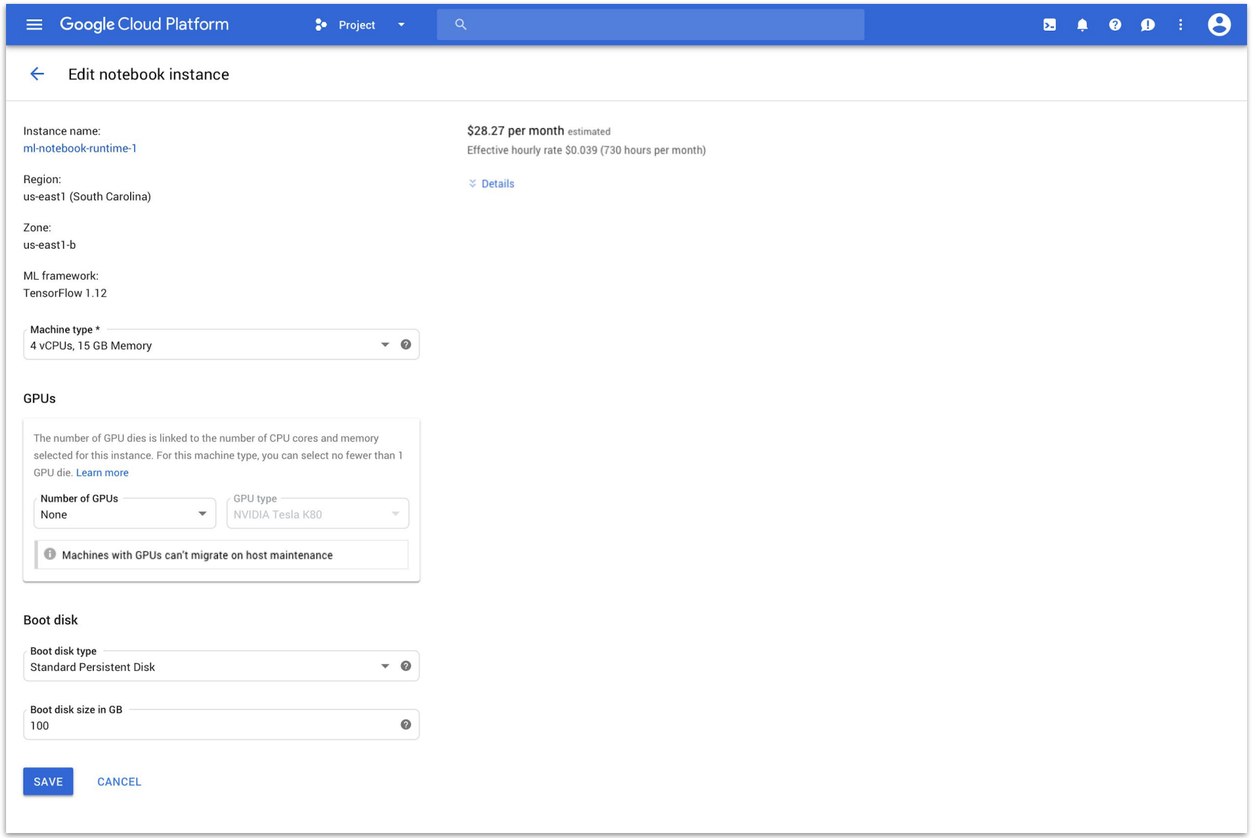
You can easily change hardware including adding and removing GPUs



Use any GCE instance type. You can pick the hardware that makes sense, and scale up or down as needed



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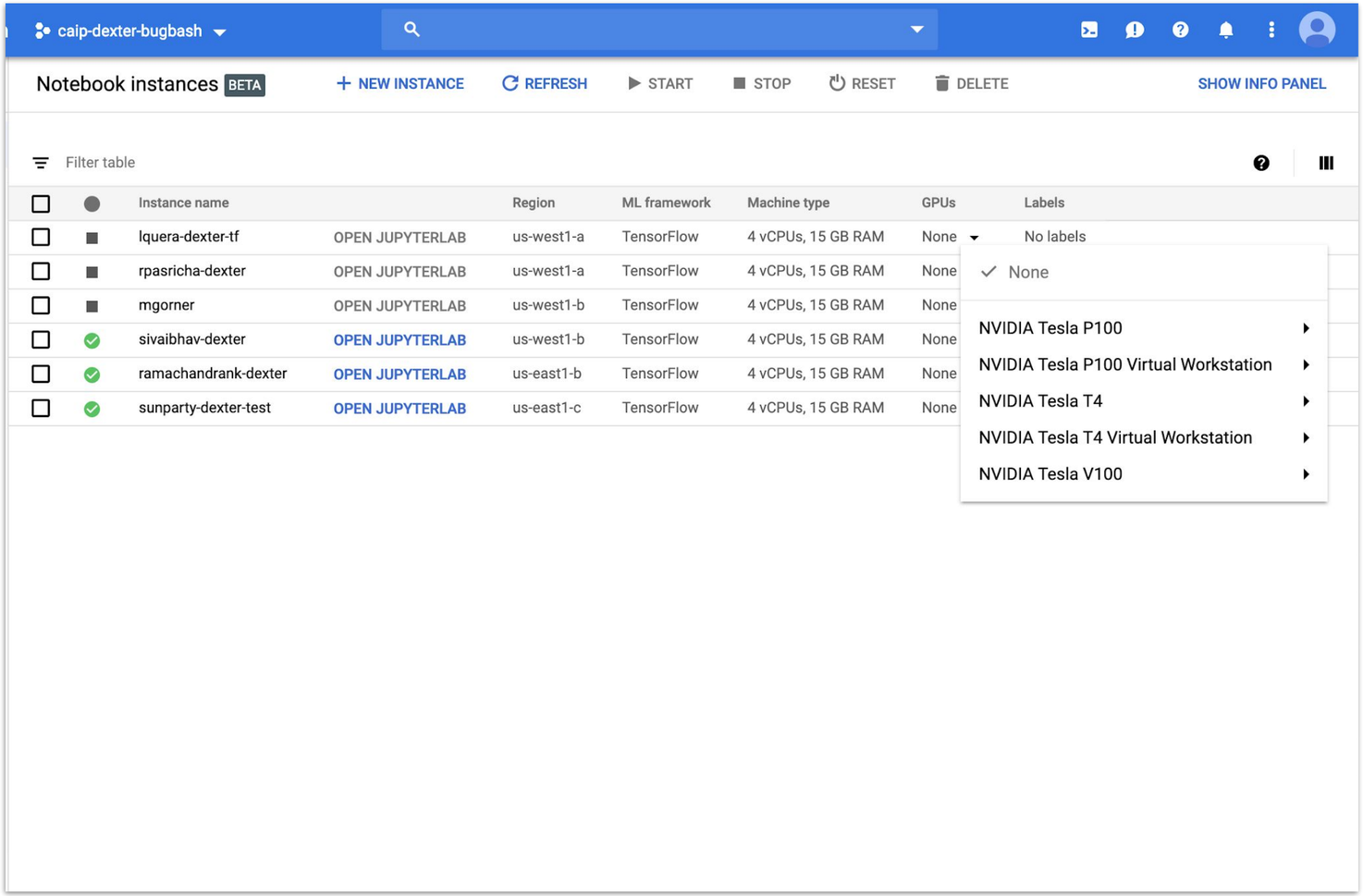
You can even add and remove GPUs



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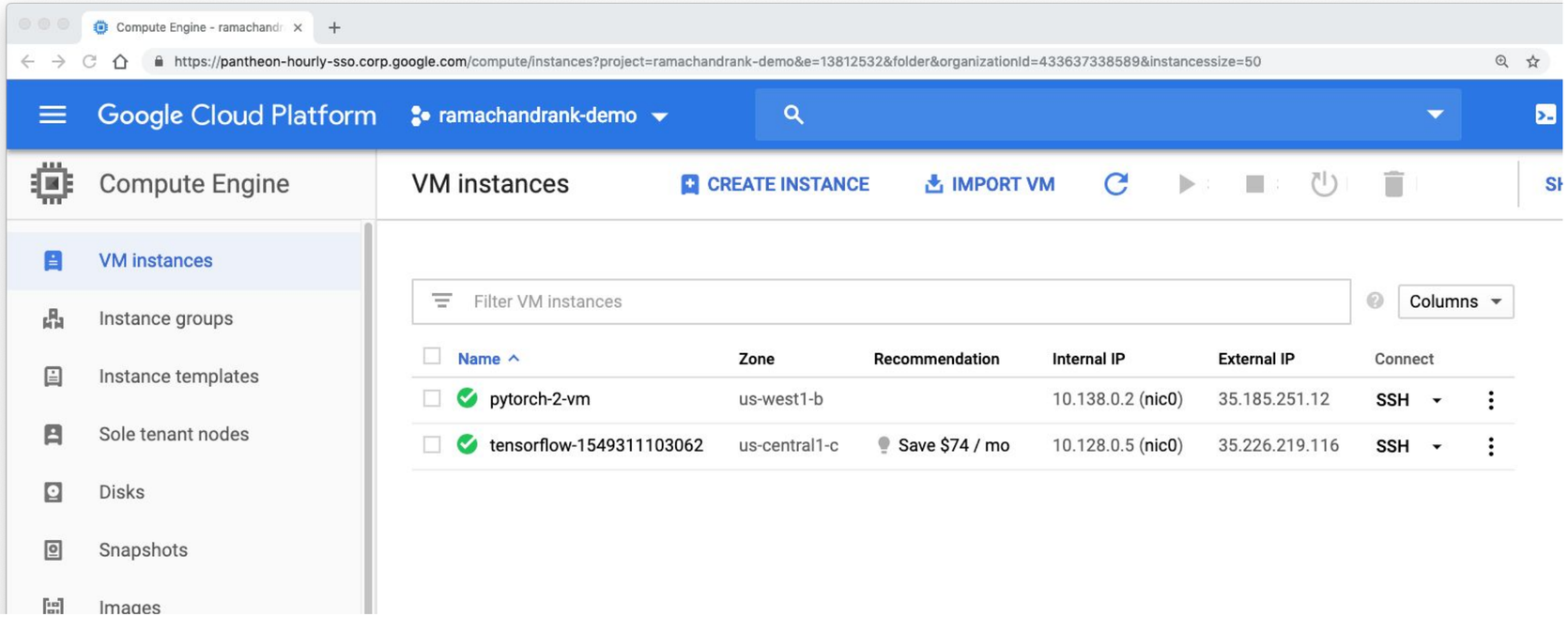
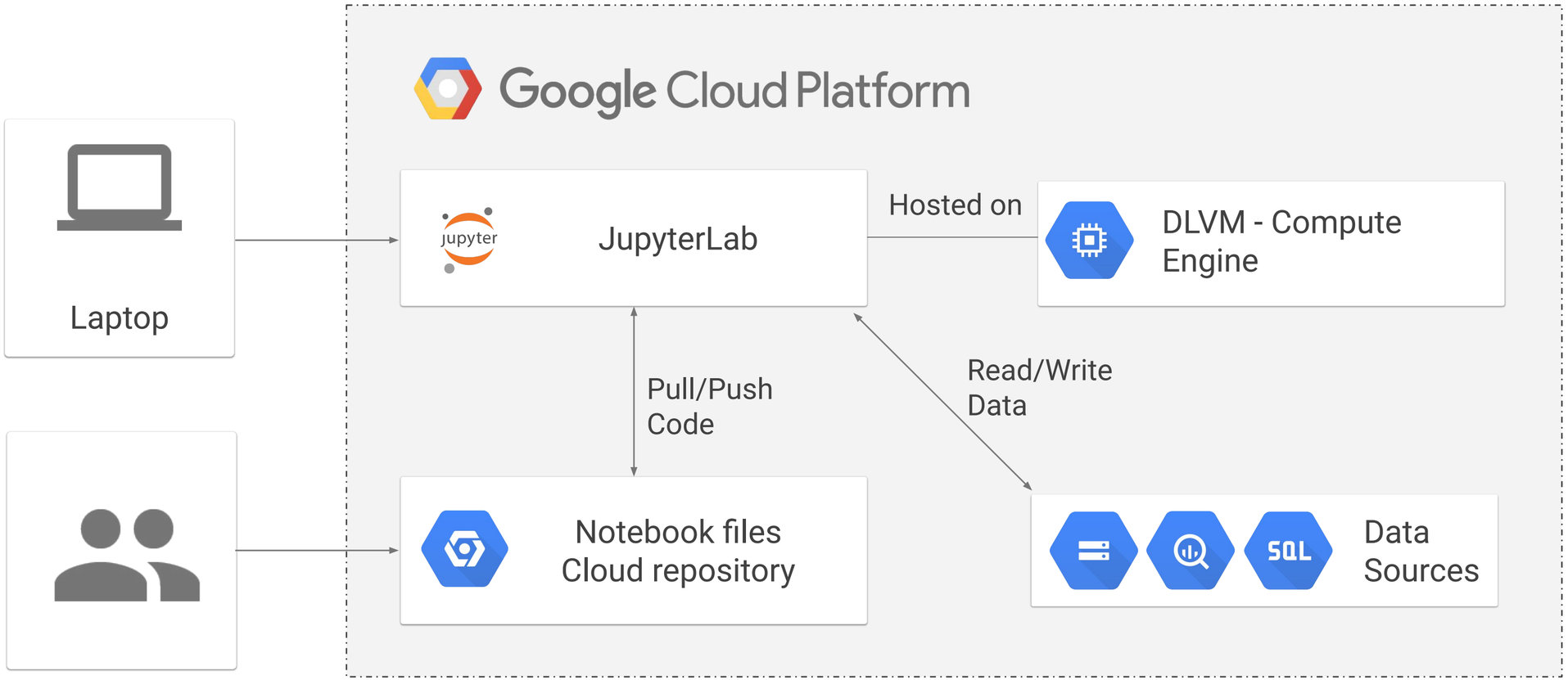
Notebook instances are standard GCE instances that live in your projects



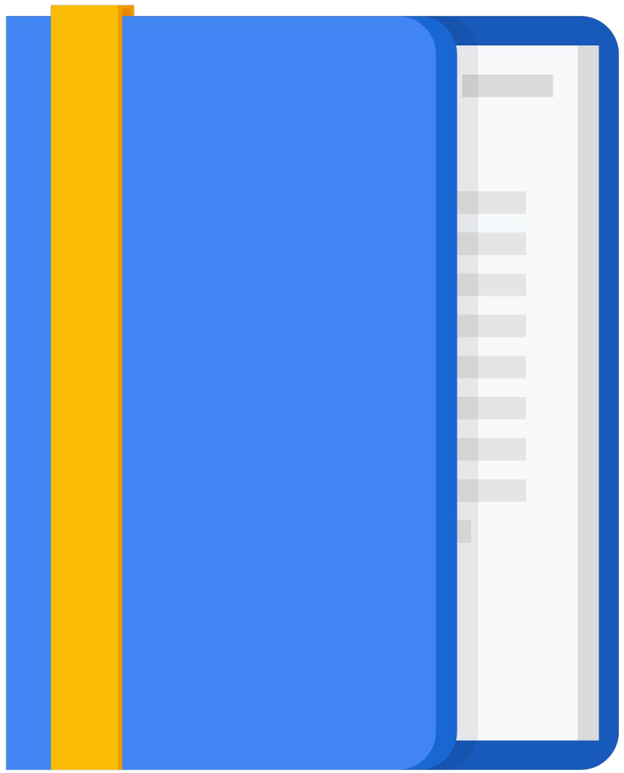
How does it work?



Agenda

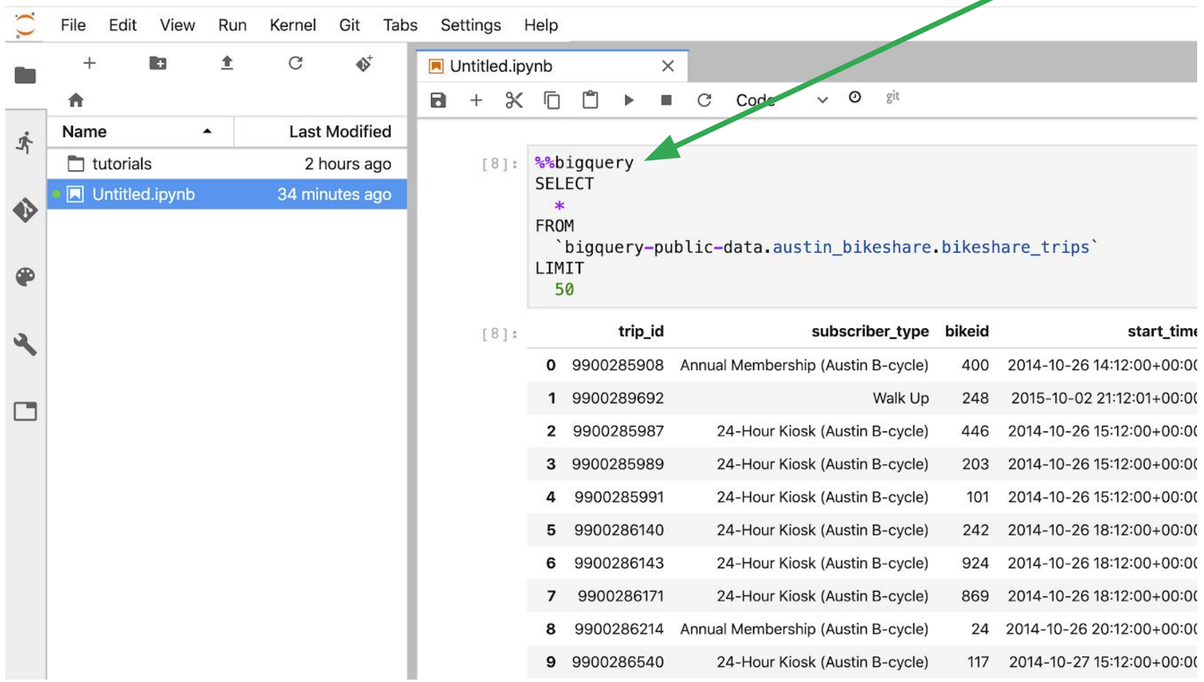
What's a Notebook

BigQuery Magic and Ties to Pandas



You can execute BigQuery commands from AI Platform Notebooks

- Useful for checking query validity
- Viewing query output
- But… can't use query output for anything



	trip_id	subscriber_type	bikeid	start_time
0	9900285908	Annual Membership (Austin B-cycle)	400	2014-10-26 14:12:00+00:00
1	9900289692	Walk Up	248	2015-10-02 21:12:01+00:00
2	9900285987	24-Hour Kiosk (Austin B-cycle)	446	2014-10-26 15:12:00+00:00
3	9900285989	24-Hour Kiosk (Austin B-cycle)	203	2014-10-26 15:12:00+00:00
4	9900285991	24-Hour Kiosk (Austin B-cycle)	101	2014-10-26 15:12:00+00:00
5	9900286140	24-Hour Kiosk (Austin B-cycle)	242	2014-10-26 18:12:00+00:00
6	9900286143	24-Hour Kiosk (Austin B-cycle)	924	2014-10-26 18:12:00+00:00
7	9900286171	24-Hour Kiosk (Austin B-cycle)	869	2014-10-26 18:12:00+00:00
8	9900286214	Annual Membership (Austin B-cycle)	24	2014-10-26 20:12:00+00:00
9	9900286540	24-Hour Kiosk (Austin B-cycle)	117	2014-10-27 15:12:00+00:00

Can use the BigQuery API in Notebooks to return query results as a Pandas DataFrame

[44]:
```
%%bigquery df
SELECT
  *
FROM
  `bigquery-public-data.austin_bikeshare.bikeshare_trips`
WHERE
  end_station_name = 'Stolen'
```

[46]:
```
print(type(df))
df.head()
```

```
<class 'pandas.core.frame.DataFrame'>
```

[46]:

	trip_id	subscriber_type	bikeid	start_time	start_station_id	start_station_name	end_station_id	end_station_name	duration_minutes
0	9900259257	Walk Up	93	2015-09-18 08:12:05+00:00	2712	Toomey Rd @ South Lamar	None	Stolen	2863
1	16898448	Walk Up	1857	2018-03-18 22:51:20+00:00	2501	5th & Bowie	None	Stolen	3806
2	9900298869	Walk Up	127	2015-10-10 19:12:38+00:00	2574	Zilker Park	None	Stolen	3632
3	9900290440	Local365	277	2015-10-02 22:12:06+00:00	2494	2nd & Congress	None	Stolen	8
4	9900322570	Walk Up	439	2015-11-01 02:12:28+00:00	2496	8th & Congress	None	Stolen	6609

Pandas DataFrame

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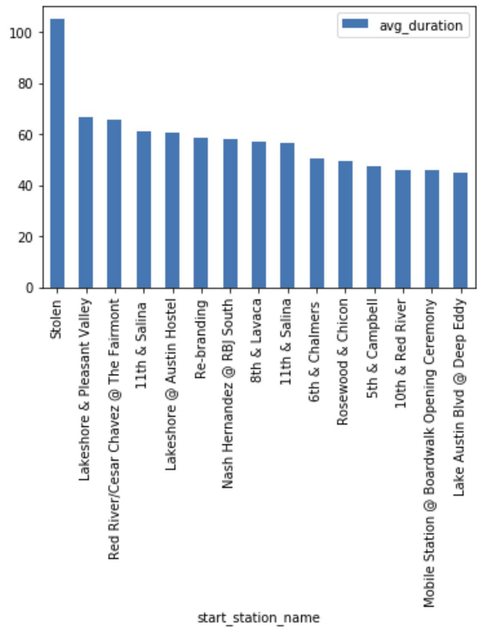
Pandas + BigQuery in Notebook rocks!

[47]:
```
%%bigquery avg_dur_by_station
SELECT
  start_station_name,
  AVG(duration_minutes) as avg_duration
FROM
  `bigquery-public-data.austin_bikeshare.bikeshare_trips`
GROUP BY
  start_station_name
ORDER BY
  avg_duration
DESC
LIMIT 15
```

[48]:
```
avg_dur_by_station.plot(x='start_station_name', y='avg_duration', kind='bar');
```



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Lab

BigQuery in Jupyter Labs on AI Platform

Objectives

- Instantiate a Jupyter notebook on AI Platform
- Execute a BigQuery query from within a Jupyter notebook and process the output using Pandas

Module Summary

- AI Platform Notebooks are ideal for prototyping machine learning pipelines and models
- Notebooks integrate nicely with BigQuery and other GCP services