

Online Services: Google, Slack, Amazon, Microsoft

UBCO Master of Data Science – DATA 530



Objectives

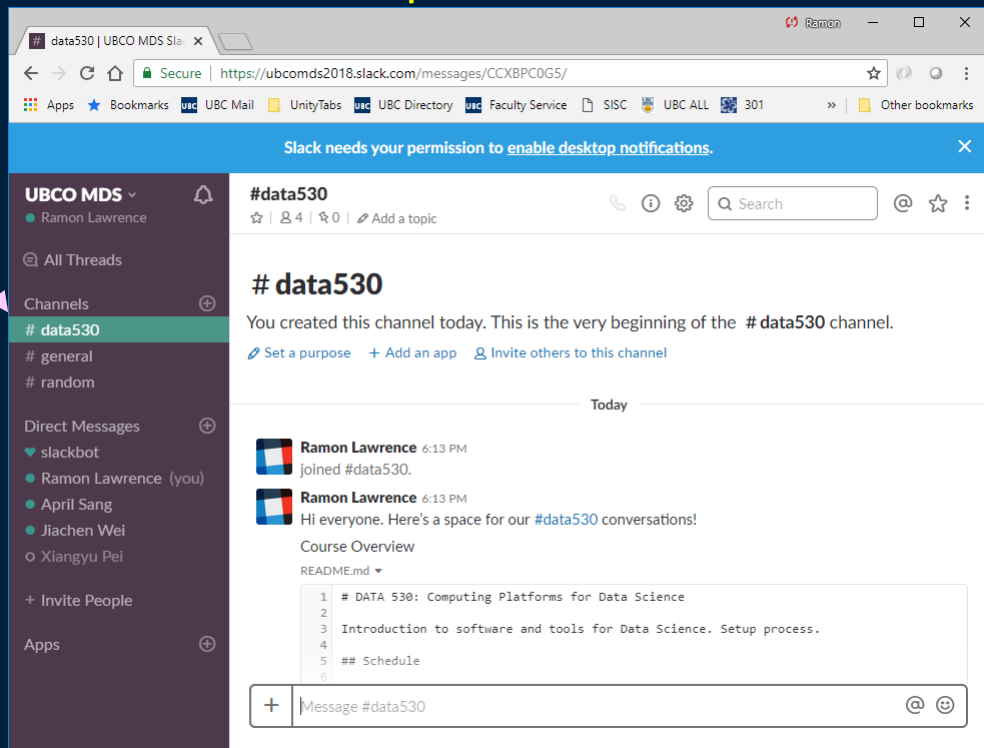
- Explain motivation for a data analyst to use cloud services for their work.
- List some of the cloud service companies and the services they provide.
- Use Slack for group communication.
- Use Google Apps for collaborative document editing.
- List some trade-offs of using cloud services versus building using in-house tools such as R and Python.
- Explain the role of Google Analytics and Google AdWords. Compare and contrast what these two services provide.

Slack

Slack is an online system for communication and collaboration.

- Popular with distributed development teams

Channels for different conversations



Try it: Slack

- 1) Accept the invite to UBCO MDS workspace and the #data530 channel.
- 2) Setup your profile: <https://get.slack.help/hc/en-us/articles/204092246>
- 3) Post some message to the #data530 channel.
- 4) Send a direct message (DM) to the instructor or another student.
- 5) To reference a user, use @username. Share a message that references another user.
- 6) Try the search feature to find messages.

Google

Google provides numerous software and services useful for a data analyst.

- Google docs – Online version similar to Microsoft Office tools
- Google API Services – program access to maps, search, and other Google services
- Google Analytics – analysis of web site traffic
- AdWords – marketing using keyword search on Google properties
- Google Cloud - web and compute hosting

Google Analytics

Google Analytics is an analysis service for tracking, optimizing, and understanding user interaction with a web site/service.

Using Google analytics is important for all business, but especially web companies, that rely on users interacting with their site to generate revenue and sales.

Google analytics helps identify and improve content to make it more accessible to potential customers.

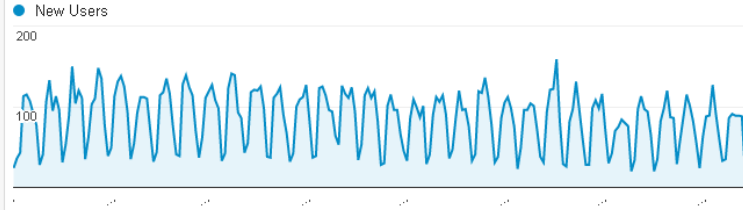
- Very important skill set for business owners and managers.

Google Analytics - Audience Overview

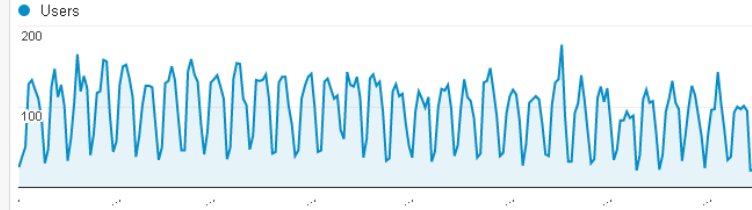


Google Analytics - Traffic Dashboard

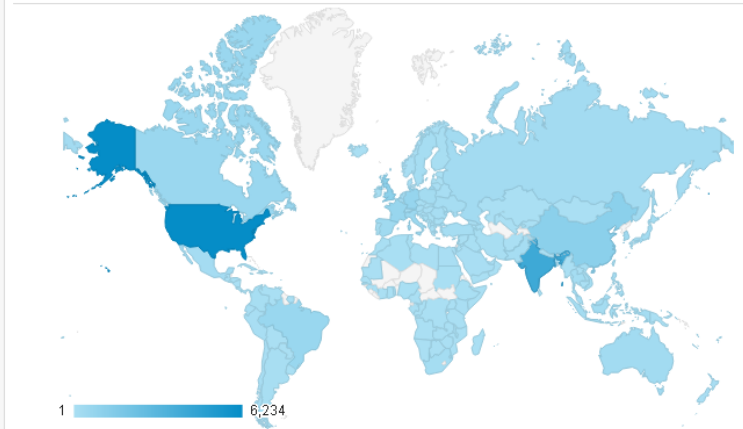
New Users



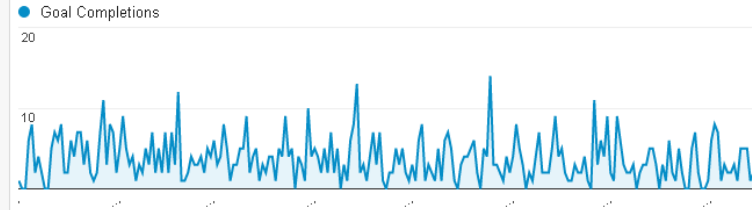
Users



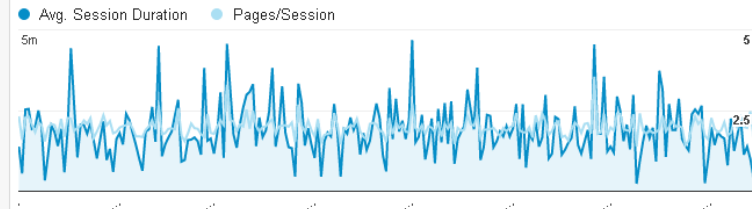
Sessions



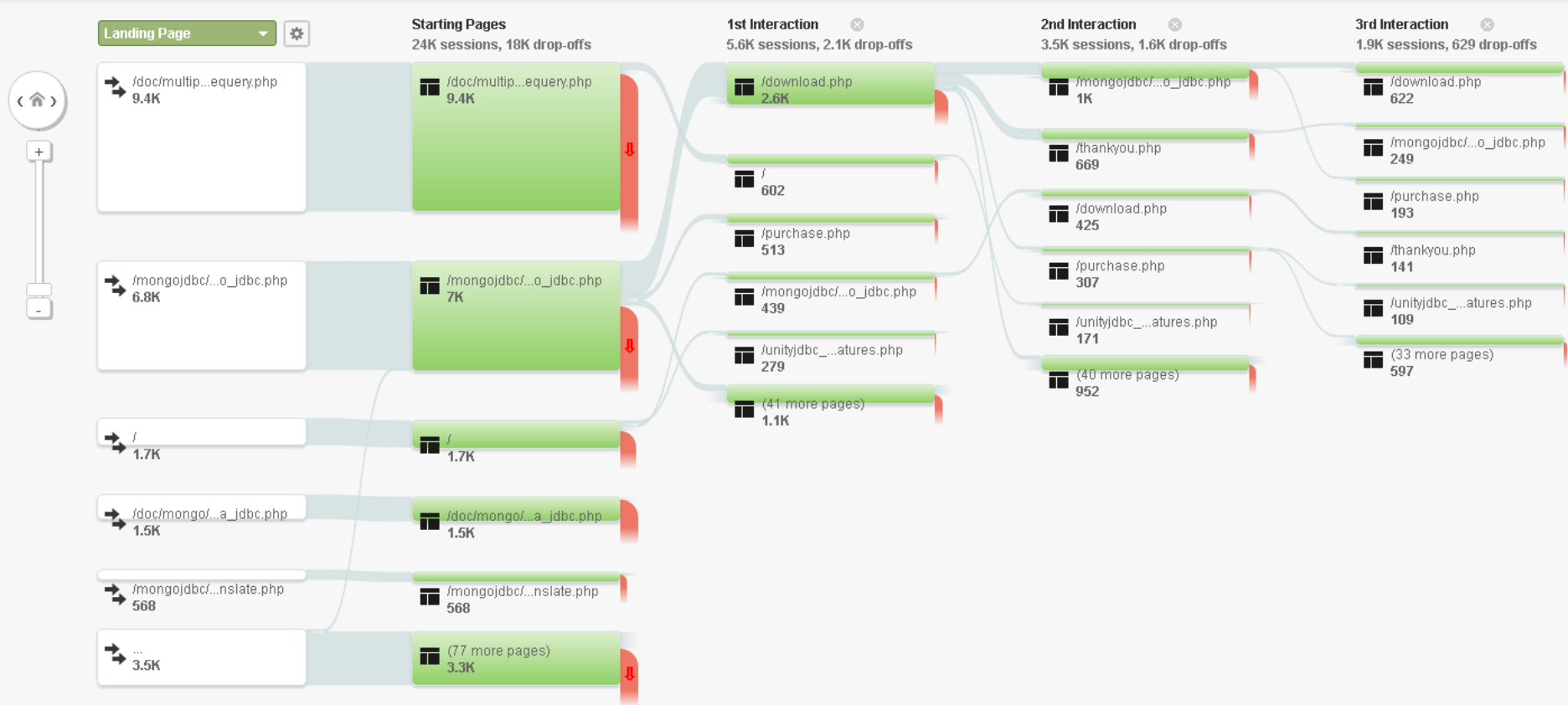
Goal Completions



Avg. Session Duration and Pages/Session



Google Analytics - Behaviour Flow



Google Adwords

Google AdWords is a service to provide advertisements during searches and as display advertisements on web sites and in apps.

- Primary source of revenue for Google. <https://www.google.ca/adwords/>
- Companies bid on *keywords* and display opportunities that are presented by Google and affiliated sites.

Terminology:

- *Ad Impression* - display of an advertisement. Pricing in cost-per-thousand impressions or cost per mille (CPM).
- *Click through* - user clicks on an advertisement (and directly to new location)
- *Click through rate* - fraction of impressions that are clicked on
- *Pay-per-click (PPC)* - companies are billed on each click of an advertisement. The pricing depends on the bid amount and the desirability of the ad location.

Try it: Google

- 1) Login to Google account.
- 2) Enter your name in the list for the "Shared DATA 530" document.
- 3) Create some other comment on the document.
- 4) Try create a spreadsheet and import your lab2.xlsx.
- 5) Discover something new. Tell the class!

Google Maps API with Python

The Google Maps API can be used with Python to access and manipulate geographical data using a Python program.

- <https://developers.google.com/maps/web-services/client-library>

Services and features:

- Geocoding and reverse geocoding
- Directions (walking, driving, transit)
- Distance calculations and routes
- Elevations
- Geolocation (based on WiFi and cell towers)
- Road information and speed limits
- Times zones and places (points of interest)

Google Maps API - Getting an API Key

The first step is to get an API key that allows access to the Google services. This API key should be kept private and not shared!

- To get a key you will need a Google account.
- No longer free access. Must provide credit card.
- Securing API keys: <https://support.google.com/cloud/answer/6310037>

Get an API key using Google Developer Console.

- <https://developers.google.com/maps/documentation/directions/get-api-key>

With directions API, test with:

- <https://maps.googleapis.com/maps/api/directions/json?origin=Toronto&destination=Montreal&key=yourkey>

Installing Google Maps API for Python

Command:

```
pip install -U googlemaps
```

Python Google Maps API Example

```
import googlemaps
from datetime import datetime

# TODO: Replace the API key below with a valid API key.
gmaps = googlemaps.Client(key='yourkey')

# Use Geocoding API to look up latitude, longitude
address = '3333 University Way, Kelowna, BC, Canada'
geocode_result = gmaps.geocode(address)

print("Geocoding address...")
print("Address:", address,
      "Coordinates:", geocode_result[0]["geometry"]["location"])
```


Python Google Maps API Example (2)

```
# Look up an address with reverse geocoding (UBC Van)
lat = 49.2683043
lon = -123.2489377
reverse_geocode_result=gmaps.reverse_geocode((lat, lon))

print("\nReverse geocoding...")
print("Coordinates: ",lat,lon,"Address:",
reverse_geocode_result[0]["formatted_address"])
```

Python Google Maps API Example (3)

```
# Request driving directions between UBCO and UBCV
directions_result = gmaps.directions(address,
    reverse_geocode_result[0]["formatted_address"],
    mode="driving", departure_time=datetime.now())
print("\nDriving directions...")
leg = directions_result[0]['legs'][0]
print("Start address:", leg['start_address'],
    "\nDestination address:", leg['end_address'])
print("Distance:", leg['distance']['text'],
    "Time:", leg['duration']['text'])

for step in leg['steps']:
    print("Step:", step['duration']['text'],
        step['html_instructions'])
```

Amazon

Amazon is the largest cloud hosting provider. Services:

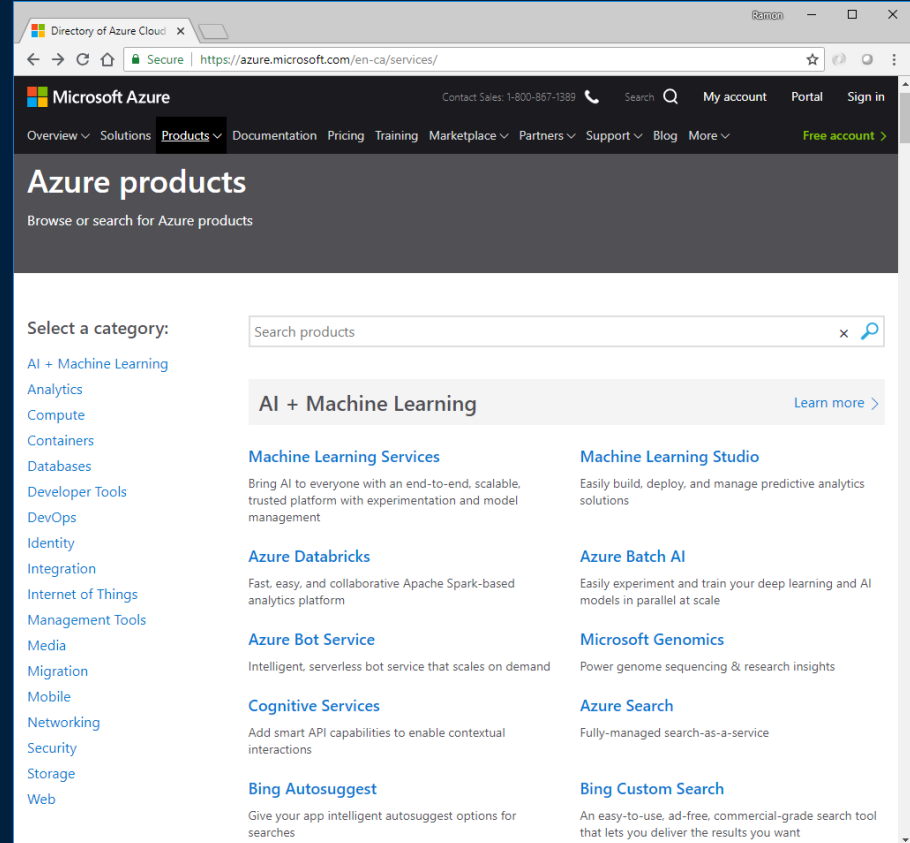
- <https://aws.amazon.com/products/>
- Compute and storage servers
- Database servers
- Machine learning services

Explore: Read about an Amazon service. Tell a partner and the class.

Microsoft

Microsoft is a diverse company with products in desktop, servers, and cloud. Branded as Microsoft Azure.

- <https://azure.microsoft.com/en-ca/services/>



The screenshot shows the Microsoft Azure website. The header includes the Microsoft Azure logo, contact information (1-800-867-1389), and navigation links for Overview, Solutions, Products, Documentation, Pricing, Training, Marketplace, Partners, Support, Blog, and More. The main section is titled 'Azure products' with a search bar and a list of categories. The 'AI + Machine Learning' category is selected, showing a grid of services including Machine Learning Services, Azure Databricks, Azure Bot Service, Cognitive Services, Bing Autosuggest, Machine Learning Studio, Azure Batch AI, Microsoft Genomics, Azure Search, and Bing Custom Search.

Directory of Azure Cloud x

Secure | <https://azure.microsoft.com/en-ca/services/>

Microsoft Azure

Contact Sales: 1-800-867-1389 Search My account Portal Sign in

Overview Solutions Products Documentation Pricing Training Marketplace Partners Support Blog More

Free account >

Azure products

Browse or search for Azure products

Select a category:

Search products

AI + Machine Learning [Learn more >](#)

Machine Learning Services

Bring AI to everyone with an end-to-end, scalable, trusted platform with experimentation and model management

Azure Databricks

Fast, easy, and collaborative Apache Spark-based analytics platform

Azure Bot Service

Intelligent, serverless bot service that scales on demand

Cognitive Services

Add smart API capabilities to enable contextual interactions

Bing Autosuggest

Give your app intelligent autosuggest options for searches

Machine Learning Studio

Easily build, deploy, and manage predictive analytics solutions

Azure Batch AI

Easily experiment and train your deep learning and AI models in parallel at scale

Microsoft Genomics

Power genome sequencing & research insights

Azure Search

Fully-managed search-as-a-service

Bing Custom Search

An easy-to-use, ad-free, commercial-grade search tool that lets you deliver the results you want

Microsoft Azure Portal

The screenshot shows the Microsoft Azure Portal interface. The left sidebar contains navigation links for various services. The main content area is titled 'Advisor recommendations' and shows a summary of recommendations across four categories: High Availability, Security, Performance, and Cost. Each category displays '0 Recommendation' and a progress bar. Below each category, there is a message stating 'You are following all of our best practice recommendations' and a link to 'See all [category] recommendations'.

Microsoft Azure

Search resources, services, and docs

Home > Advisor recommendations

Advisor recommendations

Download as CSV Download as PDF Configure

Subscriptions: Free Trial

All types Active No grouping

Overview High Availability (0) Security (0) Performance (0) Cost (0) All (0)

You are following all of our best practice recommendations
We are always evaluating your resources for new recommendations, so check back often. [Learn more](#) [What is Advisor?](#)

High Availability

0 Recommendation

0 High impact 0 Medium impact 0 Low impact

✓ You are following all of our high availability recommendations. [See all high availability recommendations](#)

Security

0 Recommendation

0 High impact 0 Medium impact 0 Low impact

✓ You are following all of our security recommendations. [See all security recommendations](#)

Performance

0 Recommendation

0 High impact 0 Medium impact 0 Low impact

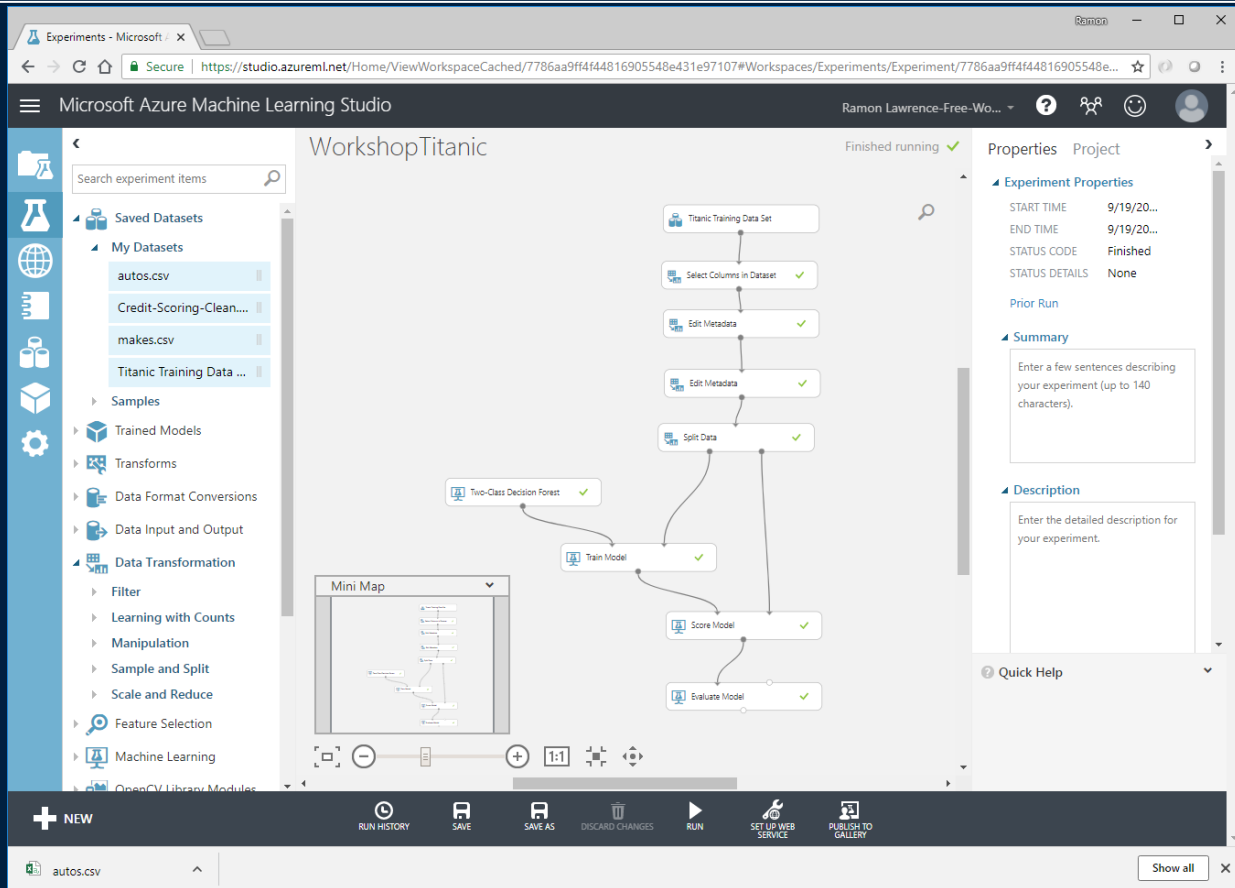
✓ You are following all of our performance recommendations. [See all performance recommendations](#)

Cost

0 Recommendation

High Medium Low

Machine Learning Studio



The screenshot displays the Microsoft Azure Machine Learning Studio interface. The main workspace shows a workflow titled "WorkshopTitanic" with the following steps:

- Titanic Training Data Set
- Select Columns in Dataset
- Edit Metadata
- Edit Metadata
- Split Data
- Two-Class Decision Forest
- Train Model
- Score Model
- Evaluate Model

A "Mini Map" is visible in the bottom left corner of the workspace. The right sidebar contains the "Properties" and "Project" tabs, with the "Experiment Properties" section showing:

- START TIME: 9/19/20...
- END TIME: 9/19/20...
- STATUS CODE: Finished
- STATUS DETAILS: None

The "Summary" section prompts the user to enter a few sentences describing the experiment (up to 140 characters). The "Description" section prompts the user to enter the detailed description for the experiment.

The bottom toolbar includes buttons for "NEW", "RUN HISTORY", "SAVE", "SAVE AS", "DISCARD CHANGES", "RUN", "SET UP WEB SERVICE", and "PUBLISH TO GALLERY".

Try it: Microsoft (Optional)

- 1) Create a free Microsoft Azure account. <https://signup.azure.com>
 - Note: Requires a credit card.
- 2) Click Create a Resource. Then search for machine learning studio.
- 3) Setup a new Machine Learning Studio instance.
- 4) Browse or experiment with ML Studio capabilities.

Conclusion

Cloud services are provided by numerous vendors which are useful for data analysts rather than implementing them directly.

- Slack, Google, Amazon, Microsoft

These services are deployed on the cloud for easy construction and use. Watch out for costs!

Services such as Google Maps API are accessible through programming languages.



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