

PICKING A GOOD WINE FOR UNDER \$30 USING ADW, ORACLE MACHINE LEARNING, OAC

FRANCESCO TISIOT
BRENDAN TIERNEY

RITTMAN MEAD
ORALYTICS

 @FTISIOT
 @BRENDANTIERNEY



FRANCESCO TISIOT

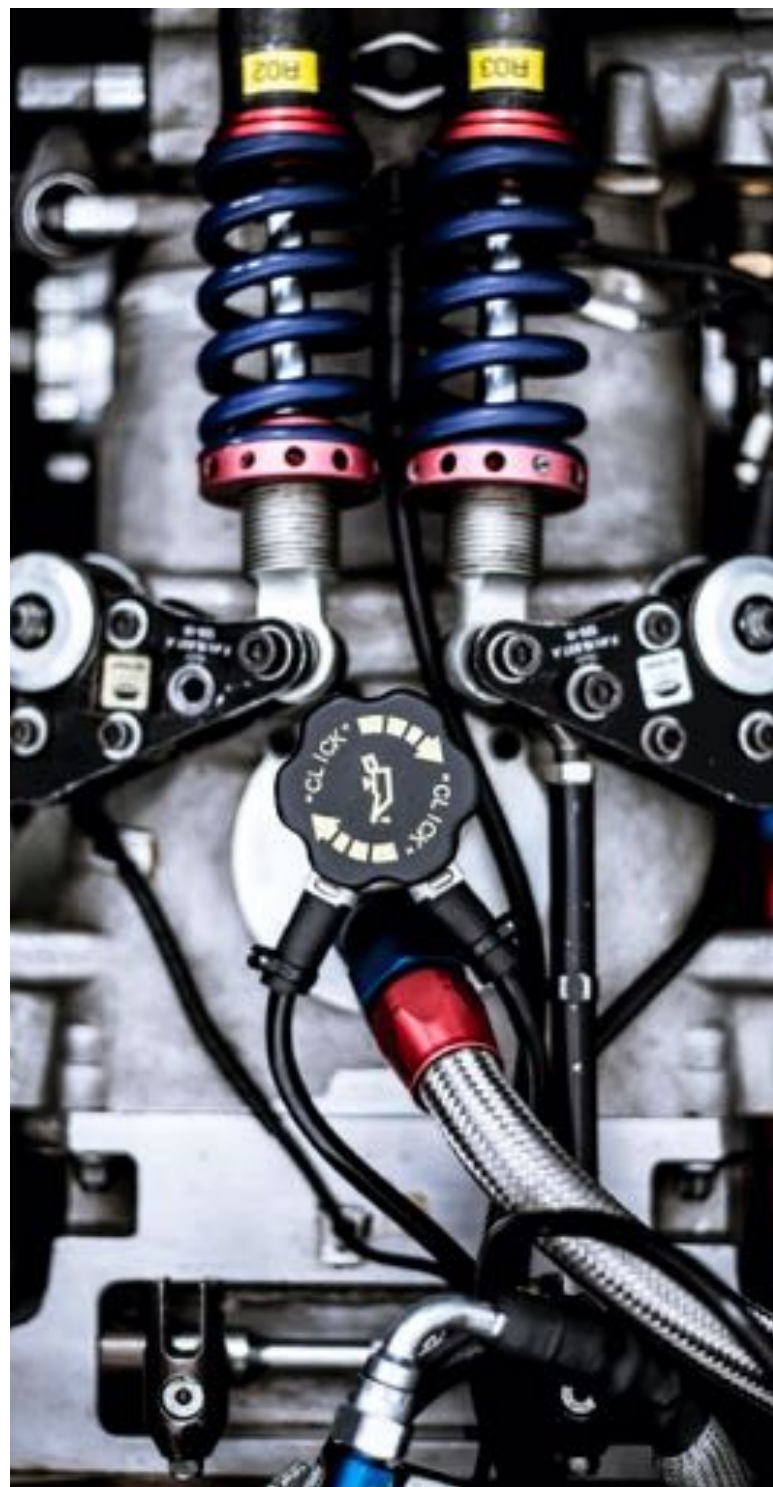
RITTMAN MEAD

@FTISIOT

BRENDAN TIERNEY

ORALYTICS

@BRENDANTIERNEY



DATA ENGINEERING



ANALYTICS




DATA SCIENCE



CAN I HAVE A GLASS OF
WINE?

YES SIR,
WHAT KIND OF WINE?


TELL ME WHAT YOU
HAVE THERE!

A man with grey hair, glasses, and a beard is smiling. He is wearing a white collared shirt. The background is a wine cellar with many shelves of wine bottles.

CAN I HAVE A GLASS OF
WINE?

YES SIR,
WHAT KIND OF WINE?

RED WINE!

A man with glasses and a beard is shown in the bottom left corner, smiling. The background is a wine cellar with many shelves of wine bottles. Three speech bubbles are overlaid on the image. The first speech bubble is at the top left, the second is at the top right, and the third is at the bottom center.


CAN I HAVE A GLASS OF
WINE?

YES,
DO YOU LIKE THIS NICE
ENGLISH PINOT NOIR??

HELL NO!

@FTISIOT

@BRENDANTIERNEY

A man with glasses and a beard is shown in the foreground, smiling. The background is a wine cellar with many shelves of wine bottles. Three speech bubbles are overlaid on the image, containing text.

CAN I HAVE A GLASS OF
WINE?

YES,
DO YOU LIKE THIS NICE
CROATIAN CABERNET??

LET ME CHECK....
95% YES!

DATASET

Dataset • Released Under CC BY-NC-SA 4.0

Wine Reviews

130k wine reviews with variety, location, winery, price, and description

zackthoutt • updated a year ago (Version 4)

[Data](#) [Overview](#) [Kernels \(1,686\)](#) [Discussion \(19\)](#) [Activity](#) [Download \(51 MB\)](#) [New Kernel](#)

Data (51 MB)

Data Sources	About this file	Columns
<ul style="list-style-type: none">winemag-data-130k... 130k x 14winemag-data_first15... 151k x 11winemag-data-130k-v2.json	<p>Here is a CSV version of the data I scraped. This dataset has three new fields --Title (which you can parse the vintage from), Taster Name, and Taster Twitter Handle. This should also fix the duplicate entries problem in the first version of the dataset and add ~25k unique reviews to play with.</p>	<ul style="list-style-type: none">#country The country that the wine is fromdescriptiondesignation The vineyard within the winery where the grapes that made the wine are frompoints The number of points WineEnthusiast rated the wine on a scale of 1-100 (though they say they

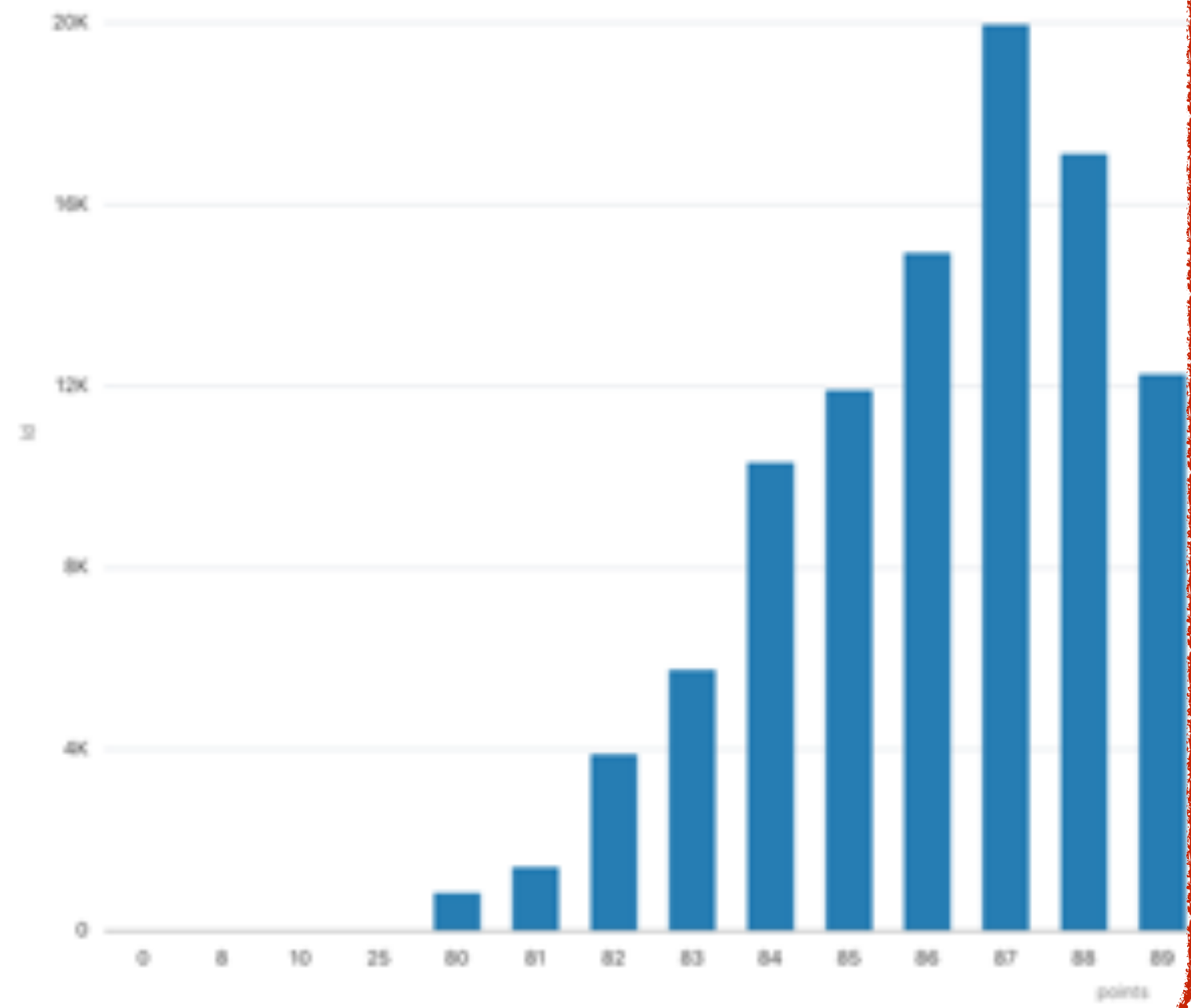
[HTTPS://WWW.KAGGLE.COM/ZYNICIDE/WINE-REVIEWS](https://www.kaggle.com/zynicide/wine-reviews)

THE DATA

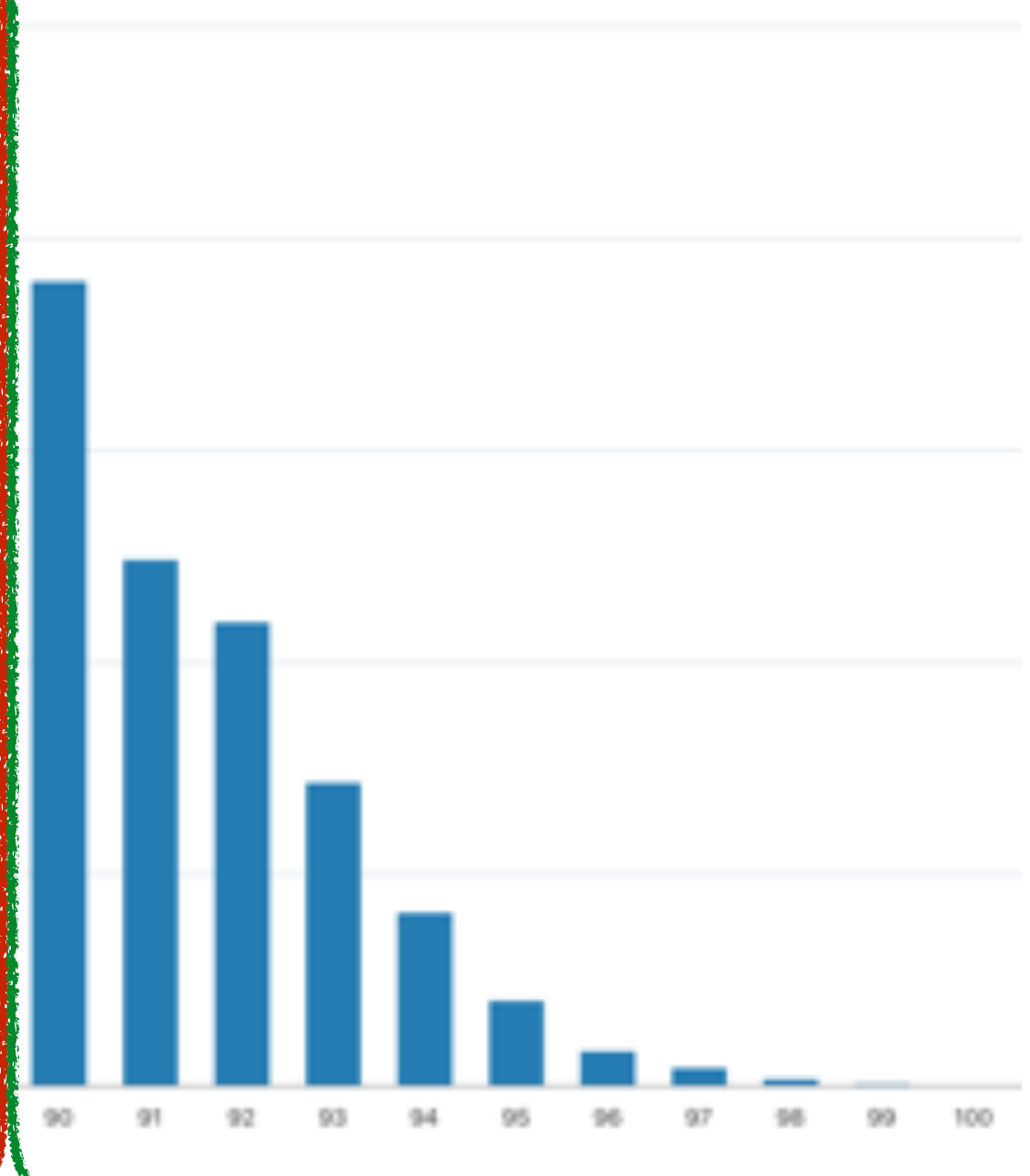
A	B	C	D	E	F	G	H	I	J	K
id	country	description	designation	points	price	province	region_1	region_2	variety	winery
0	US	This tremendous 100% Martha's Vineyard		96	235	California	Napa Valley	Napa	Cabernet Sauvignon	Heitz
1	Spain	Ripe aromas of fig, black	Canodorum Selección	96	110	Northern Spain	Toro		Tinta de Toro	Bodega Carmen Rodríguez
2	US	Mac Watson honors it	Special Selected Late	96	90	California	Knights Valley	Sonoma	Sauvignon Blanc	Macaulay
3	US	This spent 30 months	Reserve	96	65	Oregon	Willamette Valley	Willamette Valley	Pinot Noir	Ponzi
4	France	This is the top wine in	La Brûlée	95	66	Provence	Bandol		Provence red blend	Domaine de la Brûlée
5	Spain	Deep, dense and pure	Numantia	95	73	Northern Spain	Toro		Tinta de Toro	Numantia
6	Spain	Slightly gritty black-fr	San Román	95	65	Northern Spain	Toro		Tinta de Toro	Maurodos
7	Spain	Lush cedary black-fr	Canodorum vñico D	95	110	Northern Spain	Toro		Tinta de Toro	Bodega Carmen Rodríguez
8	US	This re-named vineyard	Slice	95	65	Oregon	Chehalem Mountains	Willamette Valley	Pinot Noir	Bergström
9	US	The producer sources	Gap's Crown Vineyard	95	60	California	Sonoma Coast	Sonoma	Pinot Noir	Blue Farm
10	Italy	Elegance, complexity	Ronca della Chiesa	95	80	Northeastern Italy	Collio		Friulano	Borgo del Tiglio
11	US	From 18-year-old vine	Estate Vineyard W	95	48	Oregon	Ribbon Ridge	Willamette Valley	Pinot Noir	Patricia Green Cellars
12	US	A standout even in the	Weber Vineyard	95	48	Oregon	Dundee Hills	Willamette Valley	Pinot Noir	Patricia Green Cellars
13	France	This wine is in peak co	Château Montus Pre	95	90	Southwest France	Madiran		Tannat	Vignobles Brumont
14	US	with its sophisticated	Grace Vineyard	95	185	Oregon	Dundee Hills	Willamette Valley	Pinot Noir	Domaine Serene
15	US	First made in 2006, th	Sigrid	95	90	Oregon	Willamette Valley	Willamette Valley	Chardonnay	Bergström
16	US	This blockbuster, pow	Rainin Vineyard	95	325	California	Diamond Mountain	Napa	Cabernet Sauvignon	Hall
17	Spain	Nicely oaked blackber	5 Años Reserva Pre	95	80	Northern Spain	Ribera del Duero		Tempranillo	Valduero
18	France	Coming from a seven-	Le Pigeonnier	95	290	Southwest France	Cahors		Malbec	Château Lagry/Dette
19	US	This fresh and lively	Gap's Crown Vineyard	95	75	California	Sonoma Coast	Sonoma	Pinot Noir	Gary Farrell

WINE SCORE

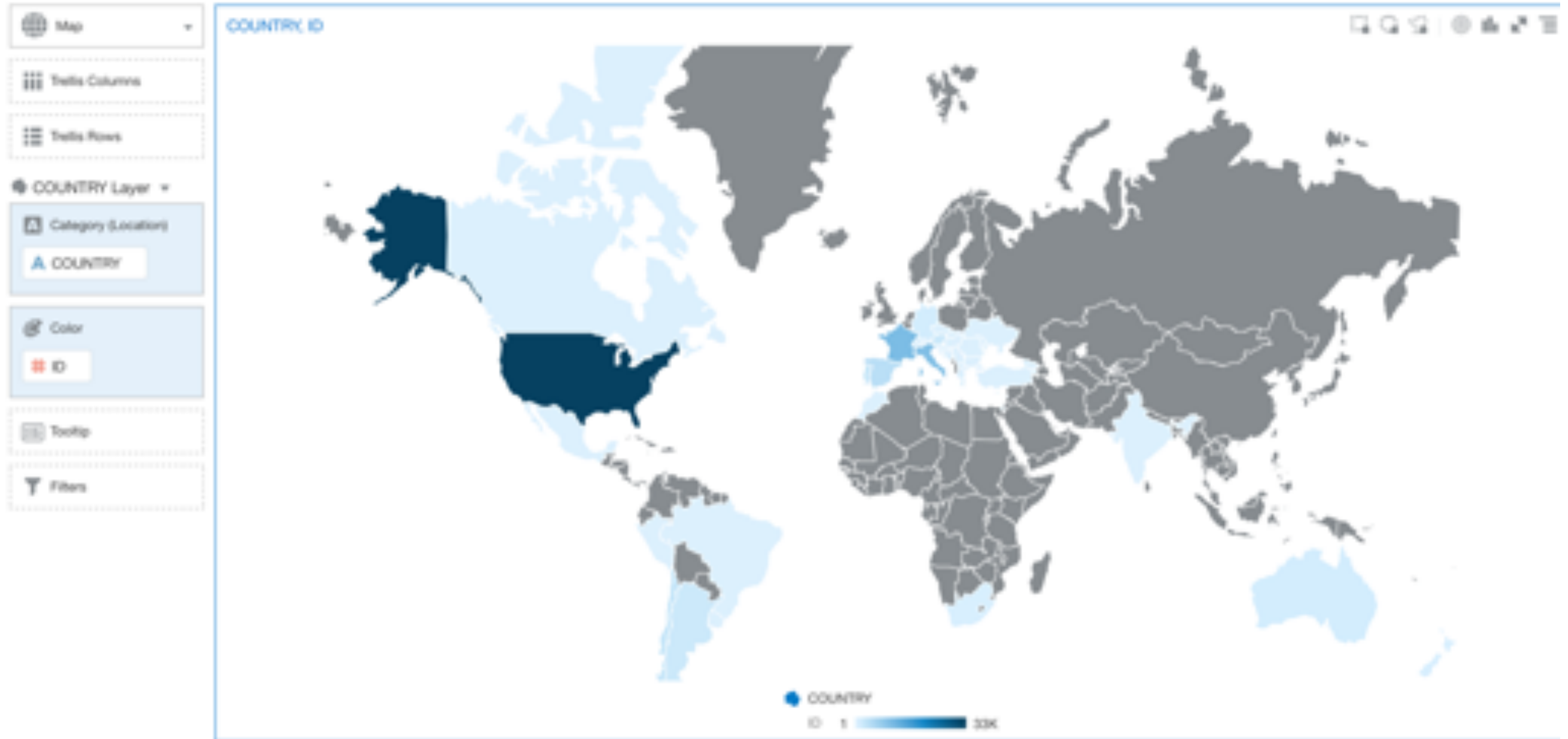
Bad



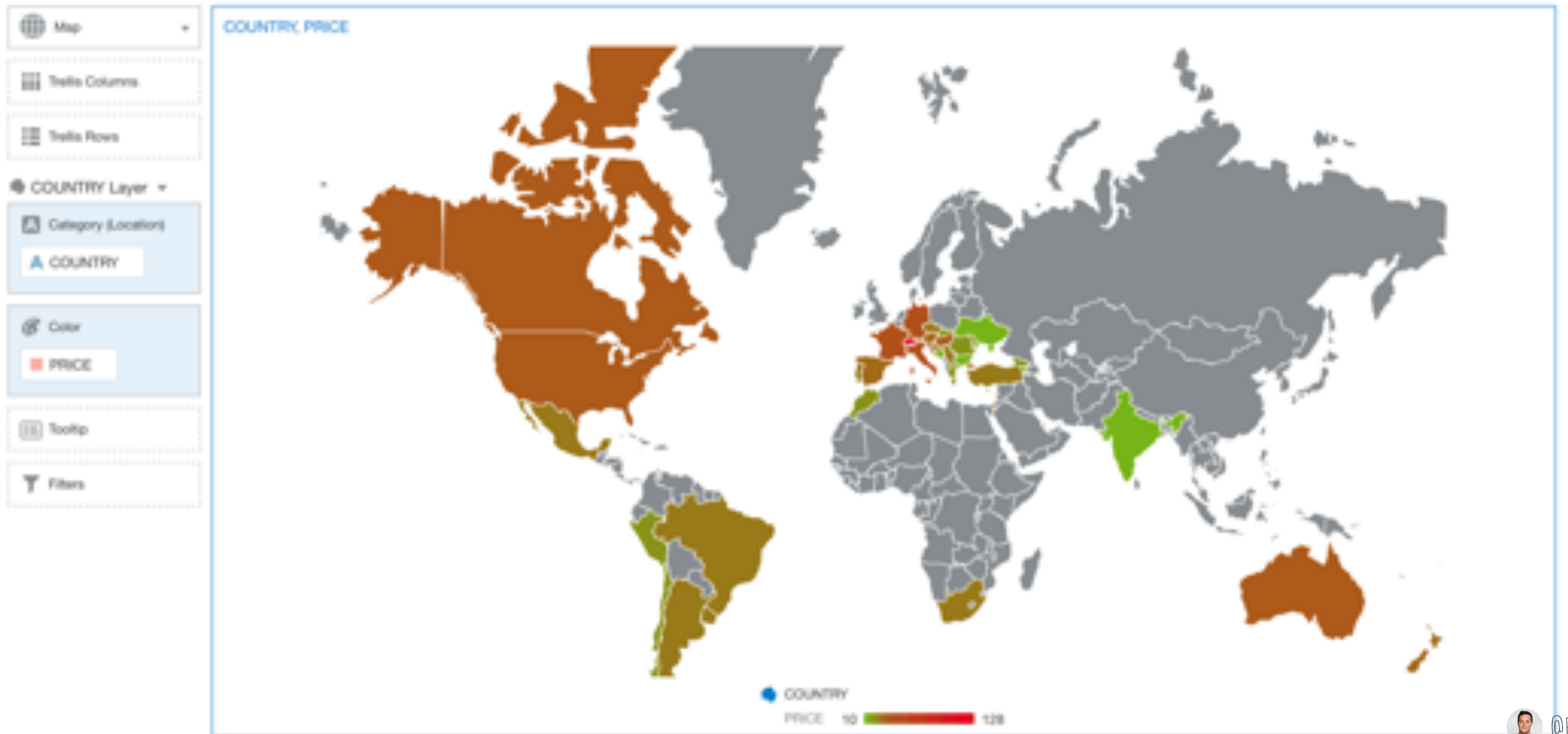
Good



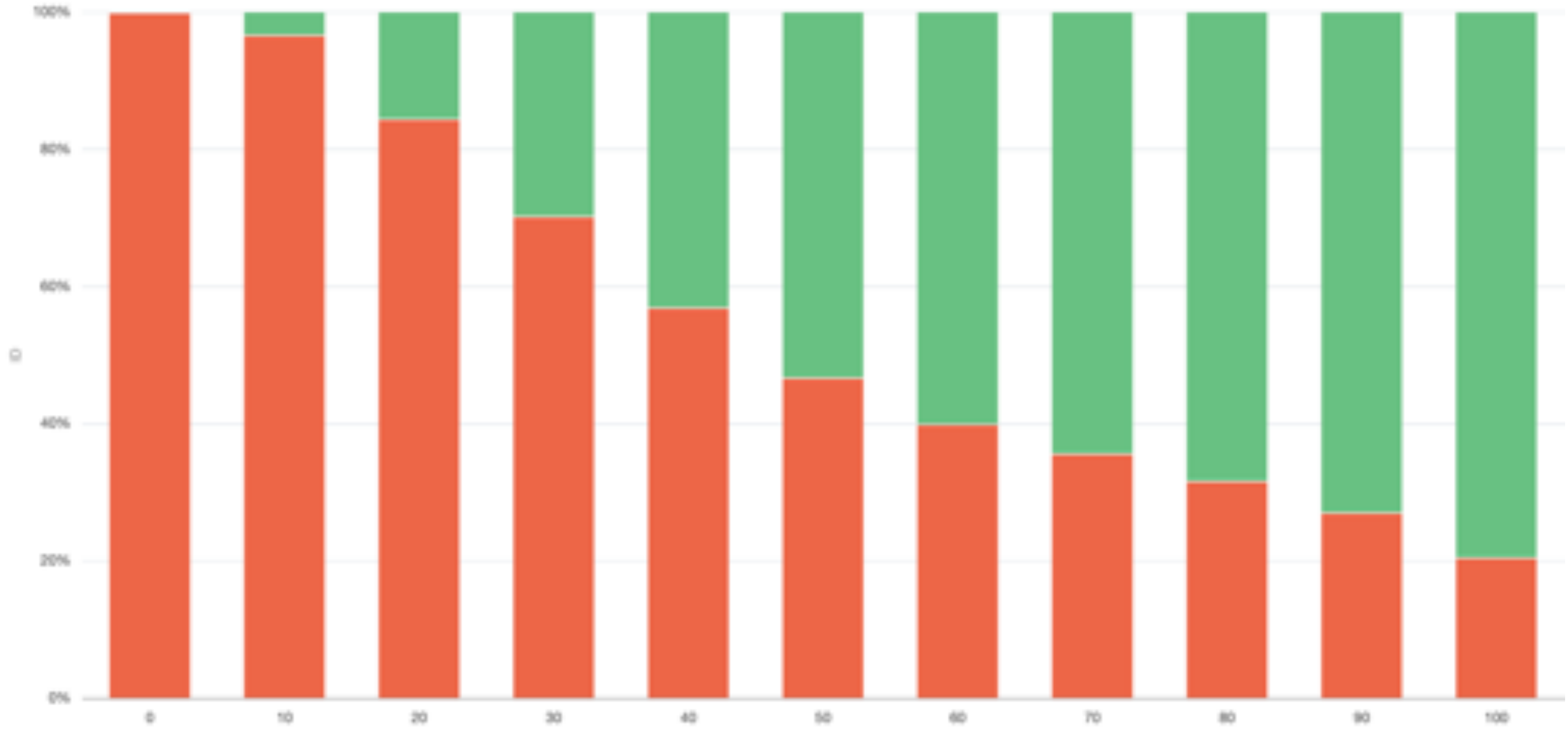
WINE SAMPLES BY COUNTRY



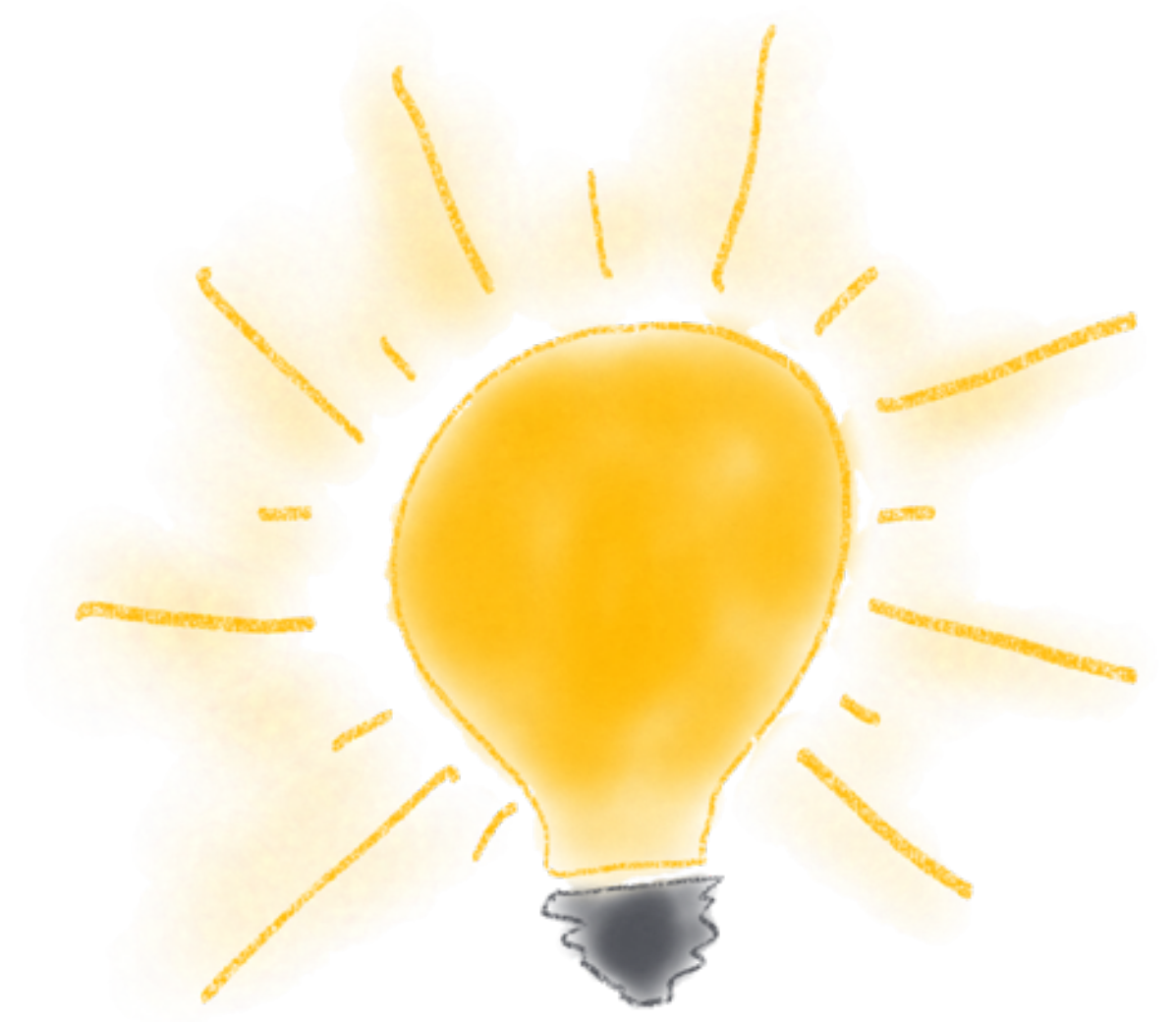
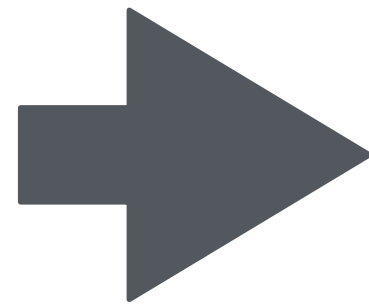
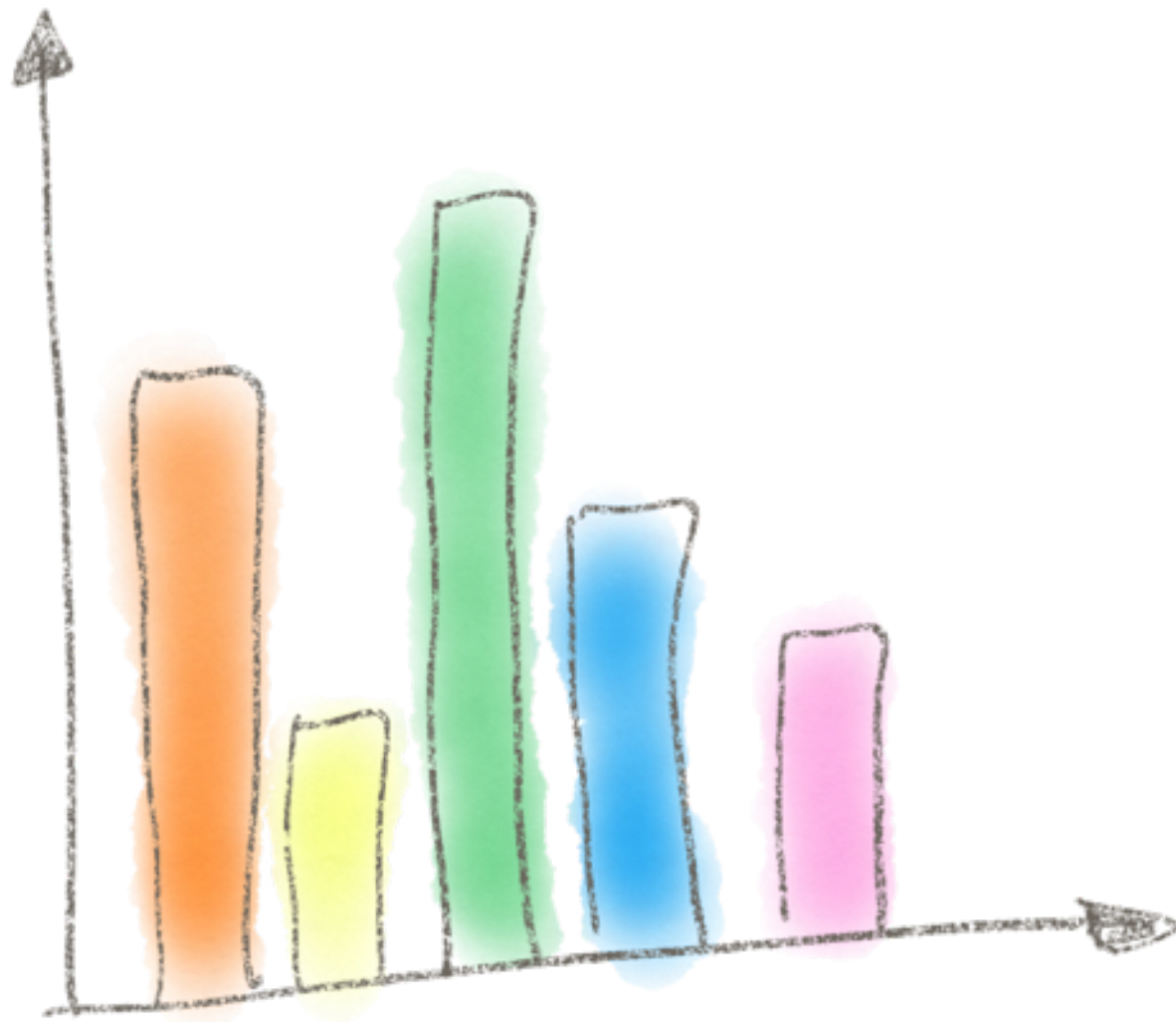
WINE PRICE BY COUNTRY



GOOD / BAD WINE BY PRICE



FROM INSIGHTS TO PREDICTIONS

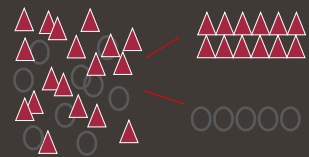


Oracle Machine Learning Algorithms



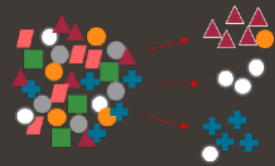
CLASSIFICATION

Naïve Bayes
Logistic Regression (GLM)
Decision Tree
Random Forest
Neural Network
Support Vector Machine
Explicit Semantic Analysis



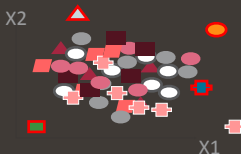
CLUSTERING

Hierarchical K-Means
Hierarchical O-Cluster
Expectation Maximization (EM)



ANOMALY DETECTION

One-Class SVM



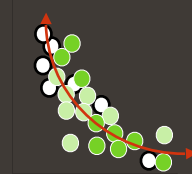
TIME SERIES

Forecasting - Exponential Smoothing
Includes popular models
e.g. Holt-Winters with trends,
seasonality, irregularity, missing data



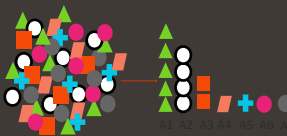
REGRESSION

Linear Model
Generalized Linear Model
Support Vector Machine (SVM)
Stepwise Linear regression
Neural Network
LASSO



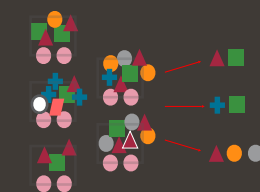
ATTRIBUTE IMPORTANCE

Minimum Description Length
Principal Comp Analysis (PCA)
Unsupervised Pair-wise KL Div
CUR decomposition for row & AI



ASSOCIATION RULES

A priori/ market basket



PREDICTIVE QUERIES

Predict, cluster, detect, features

SQL ANALYTICS

SQL Windows
SQL Patterns
SQL Aggregates

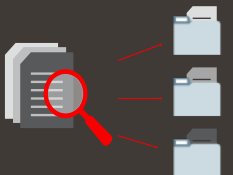


FEATURE EXTRACTION

Principal Comp Analysis (PCA)
Non-negative Matrix Factorization
Singular Value Decomposition (SVD)
Explicit Semantic Analysis (ESA)

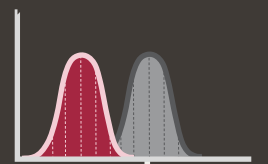
TEXT MINING SUPPORT

Algorithms support text
Tokenization and theme extraction
Explicit Semantic Analysis (ESA) for
document similarity



STATISTICAL FUNCTIONS

Basic statistics: min, max,
median, stdev, t-test, F-test, Pearson's,
Chi-Sq, ANOVA, etc.



R PACKAGES

Third-party R Packages
through Embedded Execution
Spark MLlib algorithm integration



MODEL DEPLOYMENT

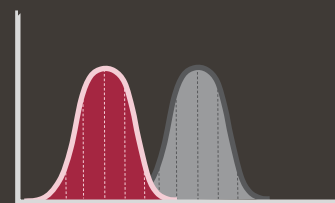
SQL—1st Class Objects
Oracle RESTful API (ORDS)
OML Microservices (for Apps)



Statistical Functions and Analytical SQL



STATISTICAL FUNCTIONS



Descriptive statistics

(e.g. median, stdev, mode, sum, etc.)

Hypothesis testing

(t-test, F-test, Kolmogorov-Smirnov test, Mann Whitney test, Wilcoxon Signed Ranks test)

Correlations analysis

(parametric and nonparametric e.g. Pearson's test for correlation, Spearman's rho coefficient, Kendall's tau-b correlation coefficient)

Ranking functions

Cross Tabulations with Chi-square statistics

Linear regression

ANOVA (Analysis of variance)

Test Distribution fit

(e.g., Normal distribution test, Binomial test, Weibull test, Uniform test, Exponential test, Poisson test)

Statistical Aggregates

(min, max, mean, median, stdev, mode, quantiles, plus x sigma, minus x sigma, top n outliers, bottom n outliers)

ANALYTICAL SQL

SQL Windows

SQL Aggregate functions

LAG/LEAD functions

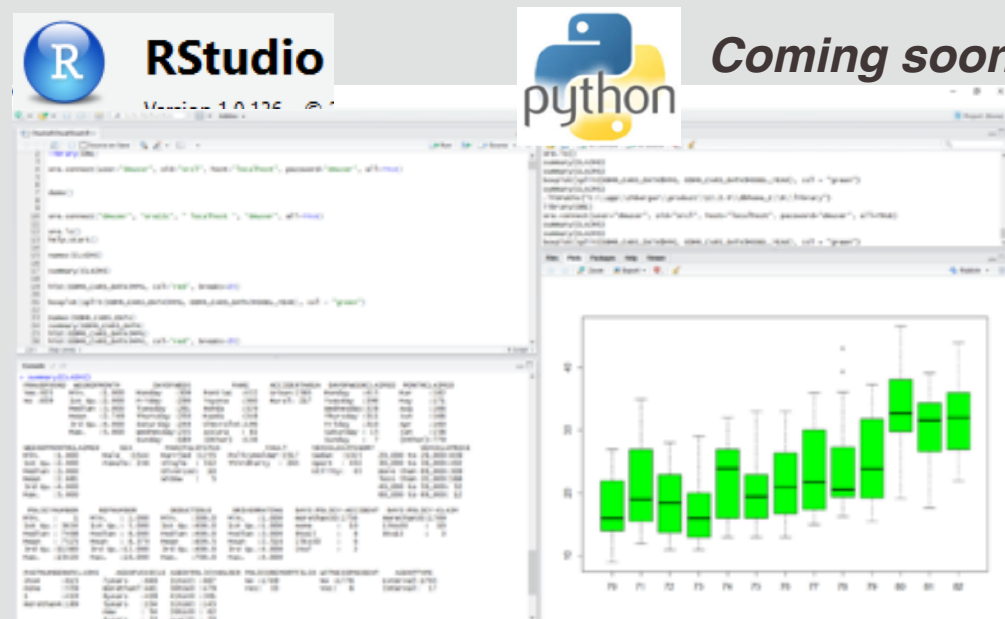
SQL for Pattern Matching

Additional approximate query processing: APPROX_COUNT, APPROX_SUM, APPROX_RANK

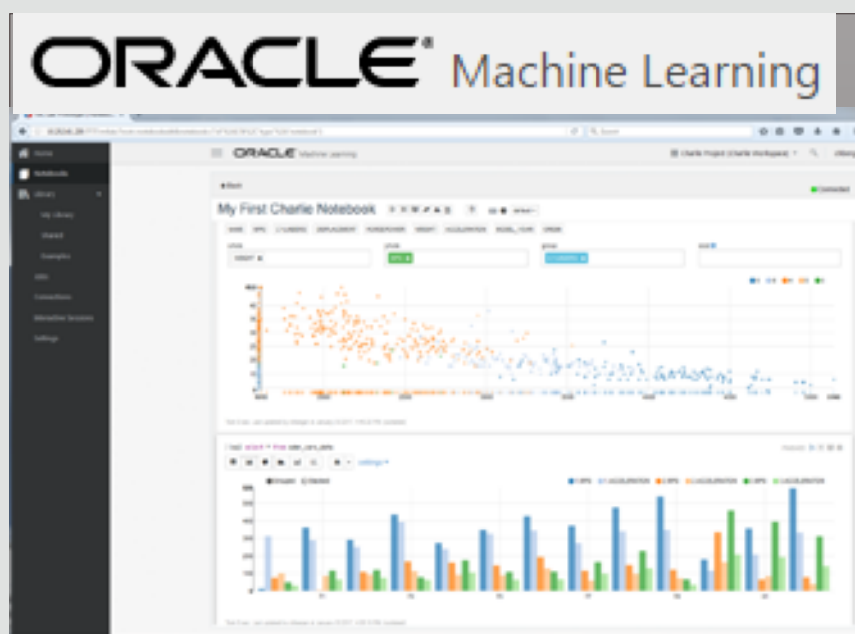
Regular Expressions

Oracle Machine Learning

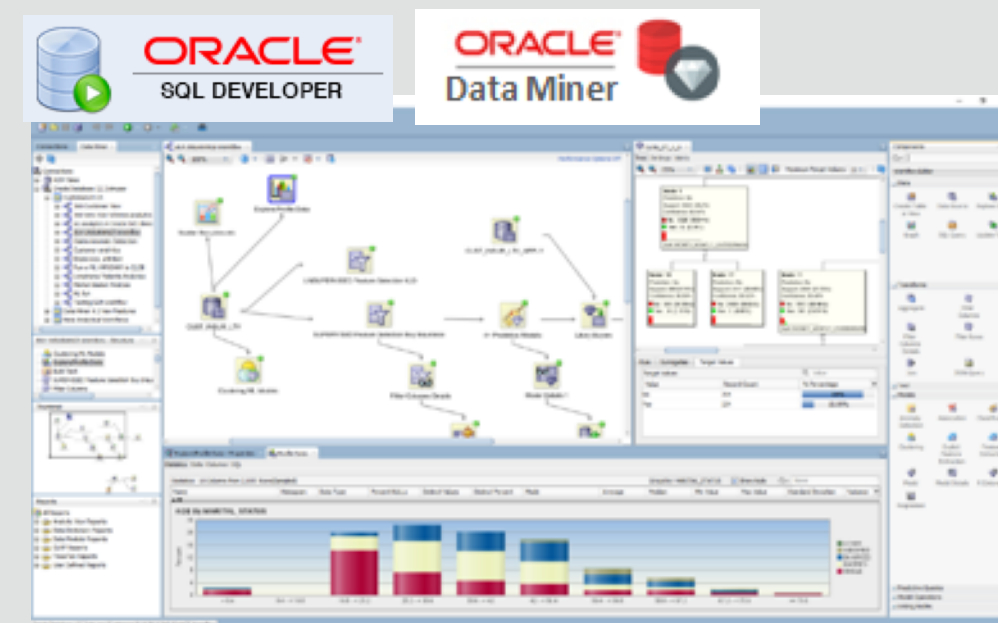
Multiple Languages UIs Supported for End Users & Apps Development



R & Python Data Scientists



Notebook Users & DS Teams



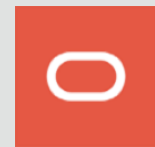
“Citizen” Data Scientists



DBAs



Application Developers



CREATE ML MODEL

BEGIN

```
DBMS_DATA_MINING.CREATE_MODEL(  
  model_name           => 'Wine_CLASS_MODEL',  
  mining_function      => dbms_data_mining.classification,  
  data_table_name     => 'Wine_TRAIN_DATA',  
  case_id_column_name => 'ID',  
  target_column_name  => 'POINTS_BIN',  
  settings_table_name => 'Wine_build_settings');
```

```
END;  
/
```

SQL>_

APPLY ML MODEL

```
SELECT PREDICTION_PROBABILITY(  
    Wine_CLASS_MODEL,  
    'GT_90_POINTS'  
    USING  
    25 as PRICE,  
    'MALBEC' as VARIETY,  
    'SPAIN' as COUNTRY  
)  
FROM dual;
```

SQL > _



Picking a Good Wine for <\$20 with ADW+OM

default

FINISHED

Selecting a wine to bring to a party that is likely to be good and is also inexpensive!

We've all been there. We are invited to a party and want to bring something to contribute. A bottle of wine is always a good option. But which one? There are so many! And we don't want to break the bank for our party gift. Let's try to use the Autonomous Database and Oracle Machine Learning to find a likely tasty and likely to be rated greater than 90 Points (GT_90_Points) adult beverage that is also affordable (Under \$35).

Original data comes from Kaggle WineReviews130K data = 130k wine reviews with variety, location, winery, price, and description etc. Wine Reviews and Twitter Handle were removed. Points was binned to GT_90 and LT_90 <https://www.kaggle.com/zynicide/wine-reviews>

Steps

1. Explore the data
2. Define the Target Attribute (GT_90_Points vs. LT_90_Points)
3. Find the Key Attributes that Most Influence GT_90_Points_Bin)
4. Build a Machine Learning Model to Predict Good Wines to Buy
5. Save our results and further investigate our wine findings using the Oracle Analytics Cloud

Task 2 ran. Last updated by BRENDAN at August 22 2020, 12:01:00 PM.



Task 3 ran. Last updated by BRENDAN at August 22 2020, 12:01:00 PM.

Let's Explore the WineReviews130K data

FINISHED

SQL

-- Explore the WineReviews130K data

Wine Reviews Data

Wine Points Ratings Distribution

Refresh

```
SQL  
select * from wine_reviews10k;
```



SQL View Last updated by CHARLIE at April 10 2016, 2:11:52 PM (auto)

Display Count of Wines by Country in Descending Order (Top 10)

Refresh

```
SQL  
select count(CO) as TOTAL, COUNTRY from wine_reviews10k group by COUNTRY order by count(CO) desc fetch first 10 rows only;
```



SQL View Last updated by CHARLIE at April 04 2016, 11:41 PM (auto)

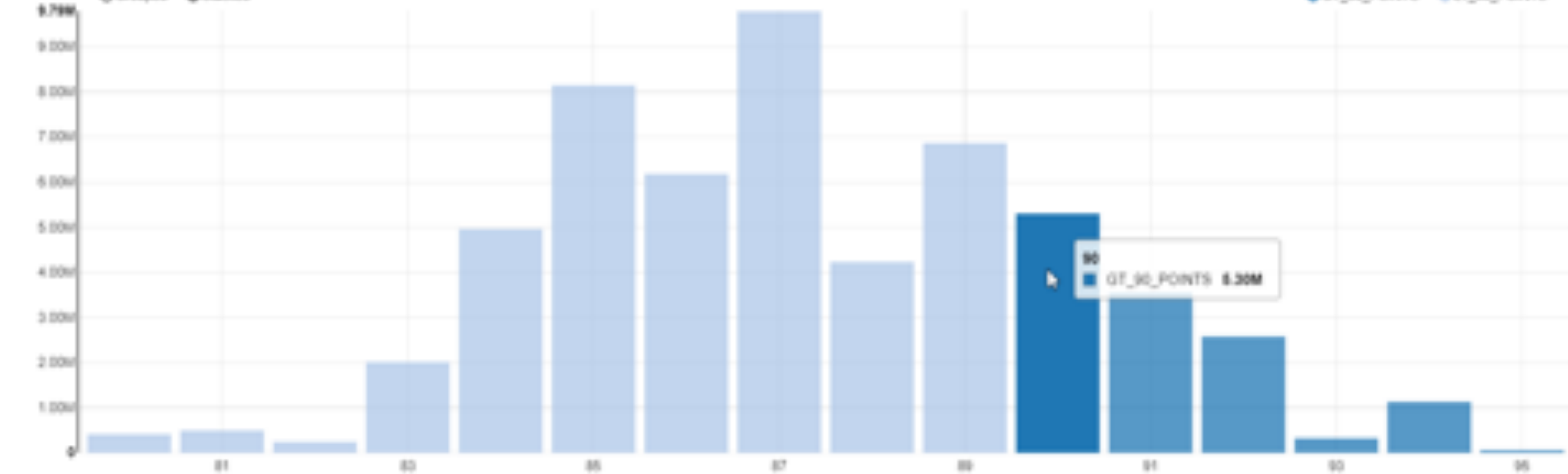
Picking a Good Wine for <\$20 with ADW+...

Wine Points Ratings Distribution; We Can Explore our Data Graphically using Simple Graphs

SQL

SELECT * FROM wine_reviews100k

Grouped Stacked



Wine Reviews Data



Build Attribute Importance Model

FINISHED

Script

```

BEGIN
  DEFS_DATA_IMPORT (DEFS_MODEL)
  model_name      => '0000_WINE_A1',
  scoring_function => DEFS_DATA_IMPORT_ATTRIBUTE_IMPORTANCE,
  data_table_name => 'WINEREVIEWS10KTarget',
  case_id_column_name => 'ID',
  target_column_name => 'POINTS_90',
  settings_table_name => 'ML_IMPORT_MODEL_SETTINGS';
END;
/

```

PL/SQL procedure successfully completed.

Task 1 was last updated by CHARLIE at April 10, 2019, 2:10:17 PM.

Show Top Attributes that Most Influence Good (GT_90_POINTS) Wines

FINISHED

```

SQL
SELECT *
FROM TABLE(DEFS_DATA_IMPORT_GET_MODEL_DETAILS_A1('0000_WINE_A1'))
ORDER BY Rank;

```

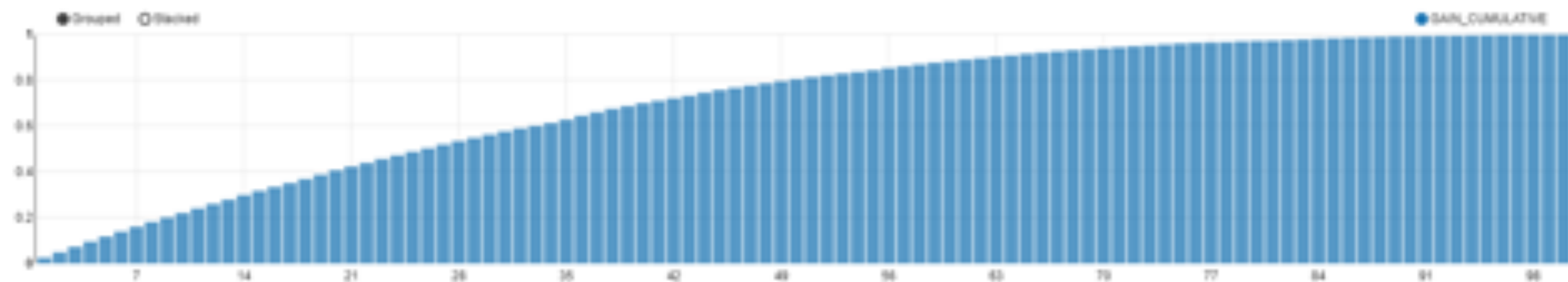


Wine Reviews Data

Show Lift Chart for Model Evaluation

FINISHED

```
SQL  
SELECT QUANTILE_NUMBER, GAIN_CUMULATIVE FROM WINE_LIFT_TABLE;
```



This chart was last updated by CHARLIE at April 22, 2019, 1:08:18 PM (UTC-07:00)

Let's Explore our Wines

FINISHED

```
SQL  
SELECT * FROM WINE_APPLY_RESULT WHERE PREDICTION = $(PREDICTION='LT_90_POINTS', 'LT_90_POINTS') | 'LT_90_POINTS';
```

PREDICTION

LT_90_POINTS

ID	PREDICTION	PROBABILITY	COST
7318	LT_90_POINTS	0.9961268289480274	0.003873171051572619
18471	LT_90_POINTS	0.9961268289480274	0.003873171051572619

OPTIONAL: INCLUDE WINE REVIEWS

Oracle Machine Learning interface showing a notebook titled ".../Nine for <\$20 with ADW+OML with Text_1". The notebook content includes a SQL query to explore the WineReviews130K data, displaying a table with columns ID, COUNTRY, and DESCRIPTION.

```
SELECT * FROM DW002.WineReviews130K_00;
```

ID	COUNTRY	DESCRIPTION
75725	US	Yellow pear skin, crushed pine needles and white rocks bolster traditional cal-pee aromas on this wine from the ancient river stone-laden Arroyo Seco appellation. Sharper grassy elements deftly integrate in and pear flavors as well. Serve with vinaigrette-doused oysters.
120628	US	This wine starts a tad reductive, but that blows off quickly to reveal aromas of seared citrus, pear blossom, apple sorbet and lemon curd. There is zippy acidity on the sip, with intriguing flavors of dried apple, syrup, as well as an earthy quality of sandy soil and dried yellow flowers.
87621	Italy	This stunning Barolo hails from the village of Verduno. Its gorgeous floral fragrance features balsamic herbs and orange peel. The palate is rich but elegant, with sweet black cherry fruit layered with spice or silky smooth already, but will gain more complexity over the next few years.
119652	Italy	Underbrush, wild berry, dark culinary spice, chopped herb and tilled earth are just some of the aromas you'll discover on this gorgeous wine. Impeccably balanced and loaded with finesse, the palate delivers cherry, clove, ground white pepper and licorice while radiant acidity and youthfully austere noble tannins provide structure. It already boasts impressive depth but it still needs to fully develop. A gorgeous win
90017	France	This wine is rich with smooth tannins that meld into fresh red-fruit flavors. It's a juicy wine with a crisp, acidic finish. Drink now.

Task Error: Last updated by CHARLE at November 29, 2016, 6:44:50 PM

Create table | Task Error

OPTIONAL: INCLUDE WINE REVIEWS

The screenshot shows the Oracle Machine Learning (OML) interface. At the top, there's a navigation bar with the Oracle logo and 'Machine Learning' text. Below that, a notebook title is displayed: '.../Nine for <\$20 with ADW+OML with Text_1'. The main content area shows a notebook titled 'Show Top Attributes that differentiate Good Wines from Bad Wines' with a 'FINISHED' status. The notebook contains a SQL query: 'SELECT * FROM DPW0000_WINE_A1 order by attribute_rank;'. Below the query is a table with the following columns: PARTITION_NAME, ATTRIBUTE_NAME, ATTRIBUTE_SUBNAME, ATTRIBUTE_IMPORTANCE_VALUE, and ATTRIBUTE_RANK. The table lists 14 attributes, with 'PALATE' having the highest importance value (0.030224752763363116) and rank 6. Other attributes include 'AROMAS', 'ACIDITY', 'RICH', 'FINISH', 'COUNTRY', 'TANNINS', 'CHERRY', and 'BLACK'. At the bottom, another notebook is partially visible: 'Build a Machine Learning Model That Predicts Good Wine (GT_90_POINTS) (Supervised Learning Classification Model using OML's Random Forest Algorithm)'. The interface also shows a 'Connected' status indicator and a user profile 'CHARLE'.

PARTITION_NAME	ATTRIBUTE_NAME	ATTRIBUTE_SUBNAME	ATTRIBUTE_IMPORTANCE_VALUE	ATTRIBUTE_RANK
	DESCRIPTION	PALATE	0.030224752763363116	6
	DESCRIPTION	AROMAS	0.027287360796487747	7
	DESCRIPTION	ACIDITY	0.027151702254768005	8
	DESCRIPTION	RICH	0.024500336400200215	9
	DESCRIPTION	FINISH	0.02420030755496467	10
	COUNTRY		0.023409140117109137	11
	DESCRIPTION	TANNINS	0.02258585947579657	12
	DESCRIPTION	CHERRY	0.022332308206452958	13
	DESCRIPTION	BLACK	0.0209622939414353	14

ORACLE APEX

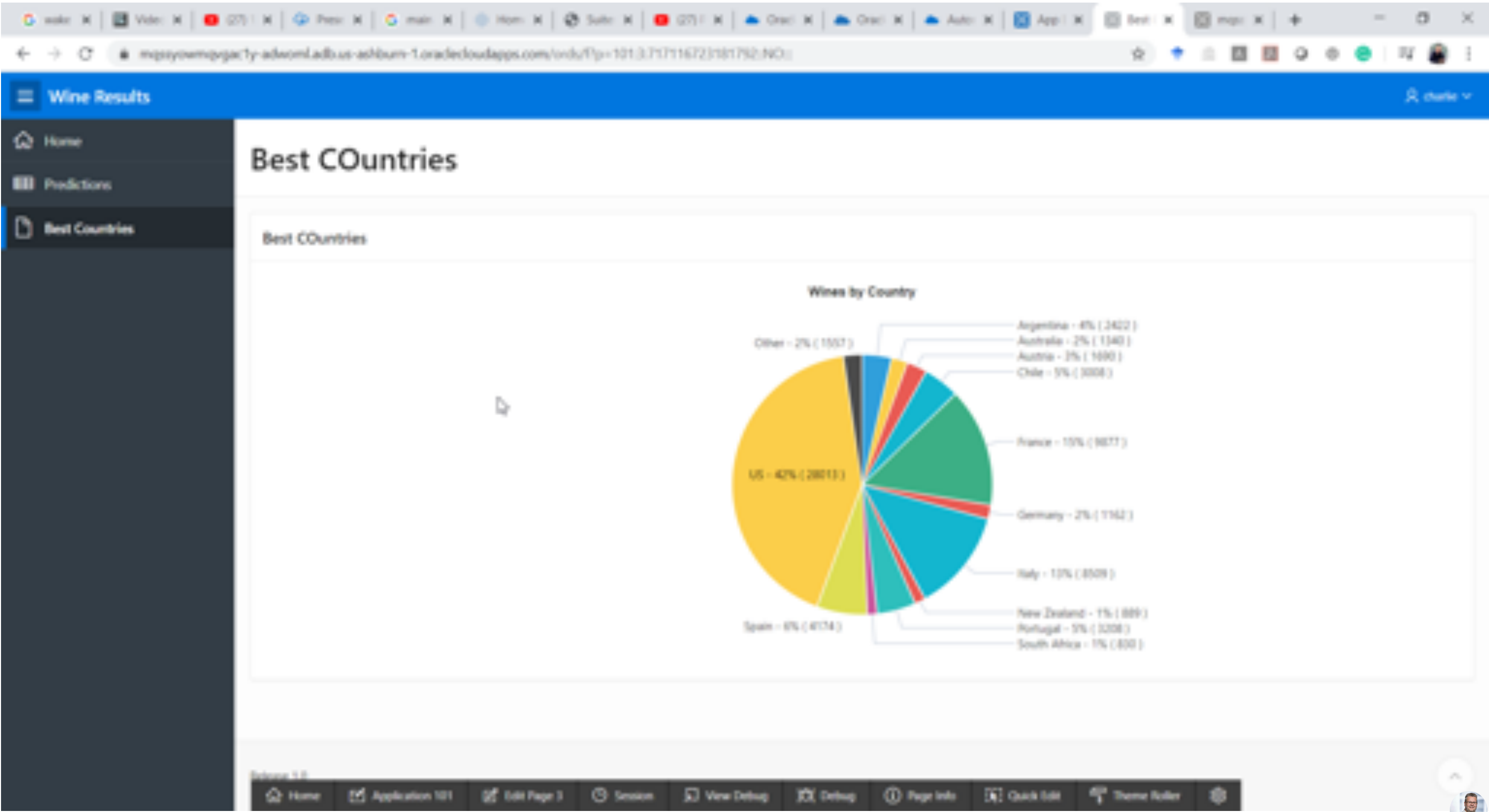
The screenshot shows a web browser window displaying an Oracle APEX application. The browser's address bar shows the URL: `https://apexsystemspgac1y-adfcoml.adf.us-ashburn-1.oraclecloudapps.com/ords/f?p=1021:LOGIN_DESKTOP:701053078639146::`. The application page has a white background with a central white box containing a blue icon of a bar chart with an upward arrow. Below the icon is the title "Wine Predictions in APEX". There are two input fields: the first contains the text "CHARLIE" and the second contains "*****". Below these fields is a checkbox labeled "Remember username" with an eye icon to its right. At the bottom of the box is a blue button labeled "Sign In". At the bottom of the browser window, there is a dark grey navigation bar with icons and labels for "Home", "Application 102", "Edit Page 9999", "Session", "View Debug", "Debug", "Page Info", "Quick Edit", and "Theme Roller".

ORACLE APEX

The screenshot shows the Oracle APEX 'Wine Results' page. The page title is 'Wine Results' and the user is logged in as 'charlie'. The main content area is titled 'Predictions' and contains a table with 10 columns: ID, Price, Country, Designation, Province, Variety, Prediction, Winery, Region 1, and Probability. The table lists 14 rows of wine data. The browser's developer tools are open at the bottom, showing the 'Page 2' tab.

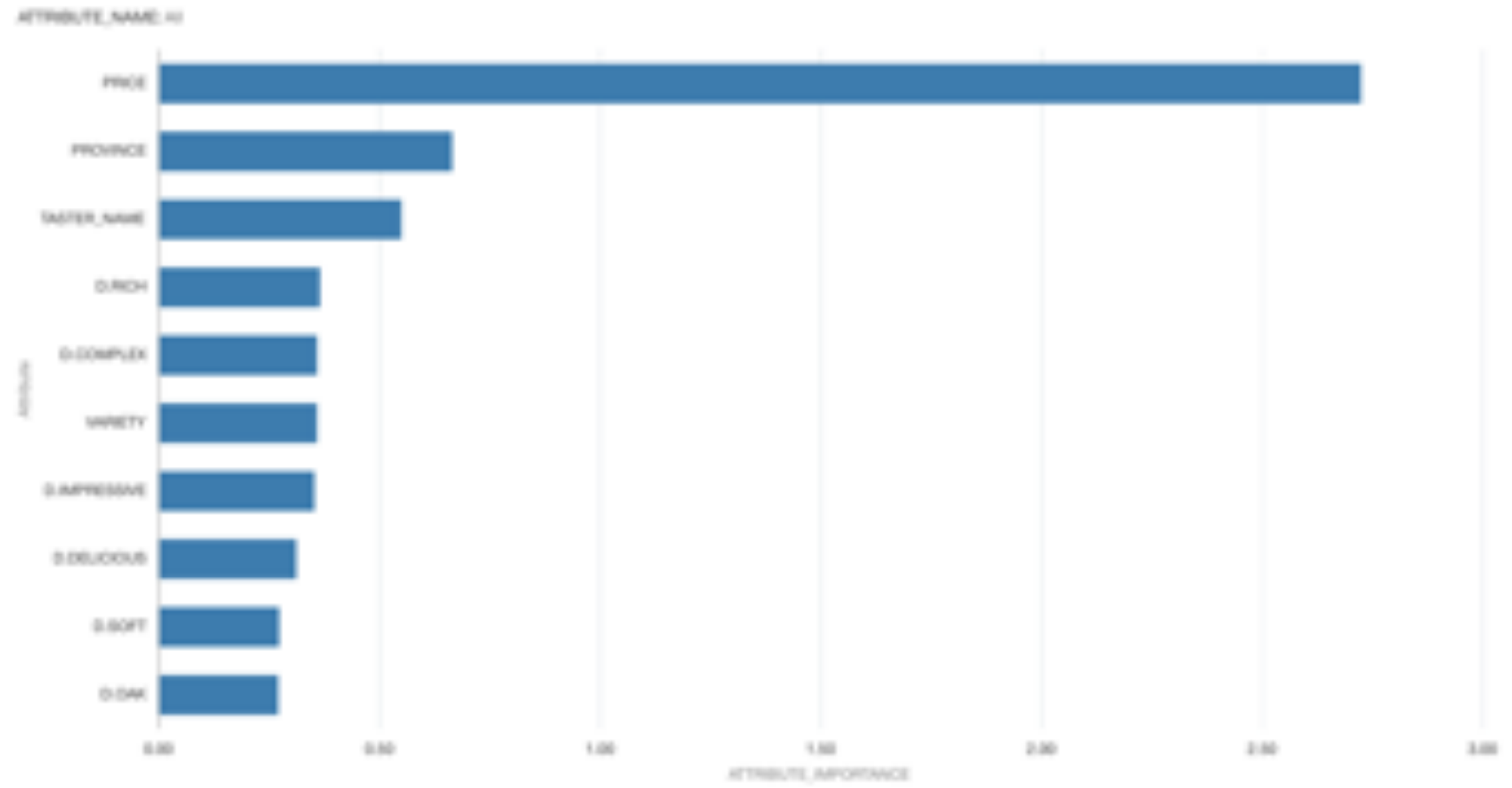
ID	Price	Country	Designation	Province	Variety	Prediction	Winery	Region 1	Probability
1	15	Portugal	Avidagos	Douro	Portuguese Red	GT_90_POINTS	Quinta dos Avidagos	-	11.23
1	15	Portugal	Avidagos	Douro	Portuguese Red	LT_90_POINTS	Quinta dos Avidagos	-	88.77
2	14	US	-	Oregon	Pfaut Gris	LT_90_POINTS	Rainstorm	Willamette Valley	86.00
2	14	US	-	Oregon	Pfaut Gris	GT_90_POINTS	Rainstorm	Willamette Valley	14.00
3	13	US	Reserve Late Harvest	Michigan	Riesling	LT_90_POINTS	St. Julian	Lake Michigan Shore	99.73
3	13	US	Reserve Late Harvest	Michigan	Riesling	GT_90_POINTS	St. Julian	Lake Michigan Shore	0.27
4	65	US	Vintner's Reserve Wild Child Block	Oregon	Pfaut Noir	GT_90_POINTS	Sweet Cheeks	Willamette Valley	91.09
4	65	US	Vintner's Reserve Wild Child Block	Oregon	Pfaut Noir	LT_90_POINTS	Sweet Cheeks	Willamette Valley	8.91
5	15	Spain	Ars In Vitro	Northern Spain	Tempranillo-Merlot	GT_90_POINTS	Tandem	Navarra	0.43
5	15	Spain	Ars In Vitro	Northern Spain	Tempranillo-Merlot	LT_90_POINTS	Tandem	Navarra	99.57
6	16	Italy	Belfata	Sicily & Sardinia	Fragapato	LT_90_POINTS	Tene di Gurfo	Vittoria	90.75
6	16	Italy	Belfata	Sicily & Sardinia	Fragapato	GT_90_POINTS	Tene di Gurfo	Vittoria	9.25
7	24	France	-	Alsace	Grand Cru Riesling	GT_90_POINTS	Troisbichs	Alsace	45.30
7	24	France	-	Alsace	Grand Cru Riesling	LT_90_POINTS	Troisbichs	Alsace	54.70

ORACLE APEX

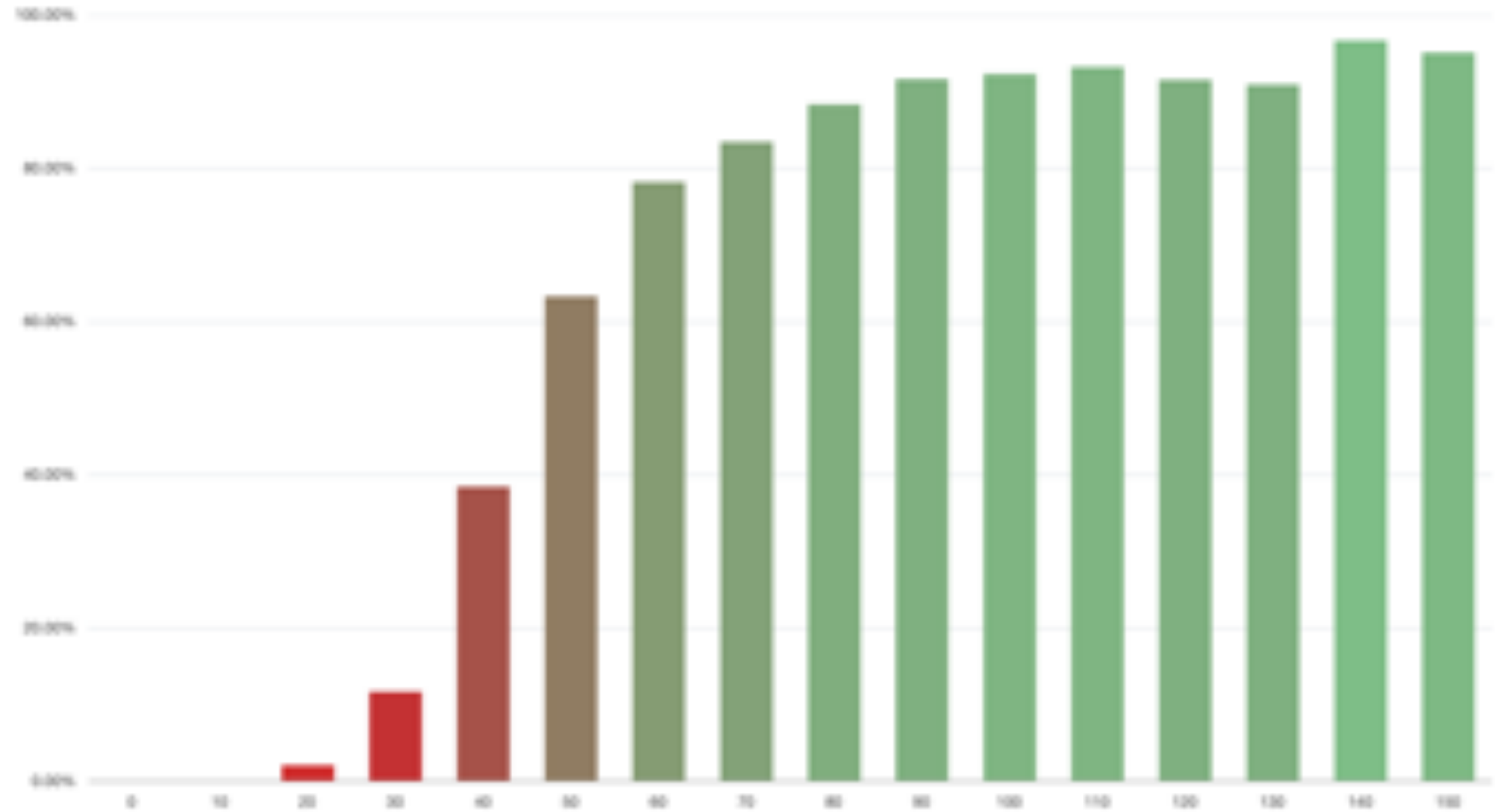


Top 10 ATTRIBUTE_IMPORTANCE ATTRIBUTE_NAME (x)

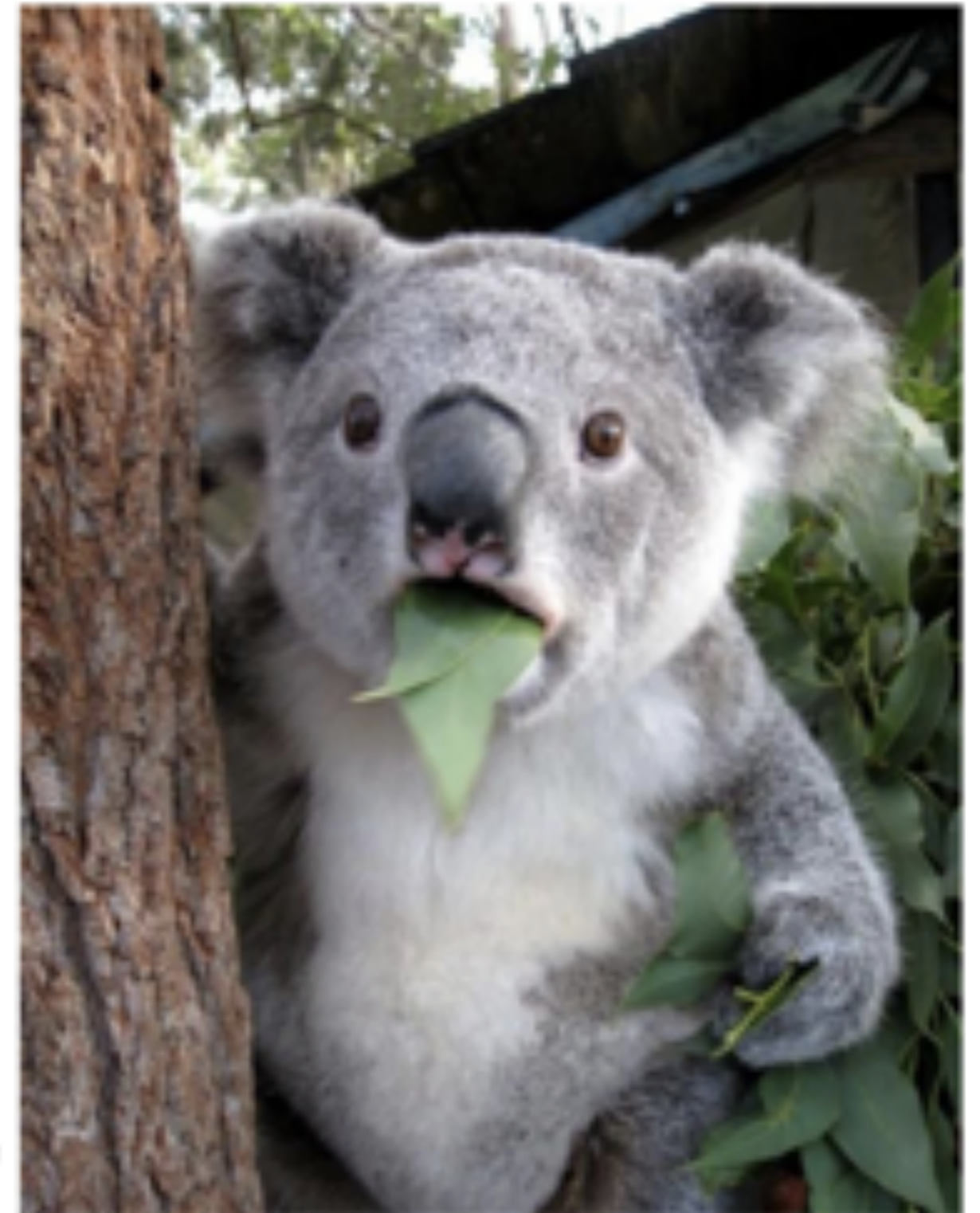
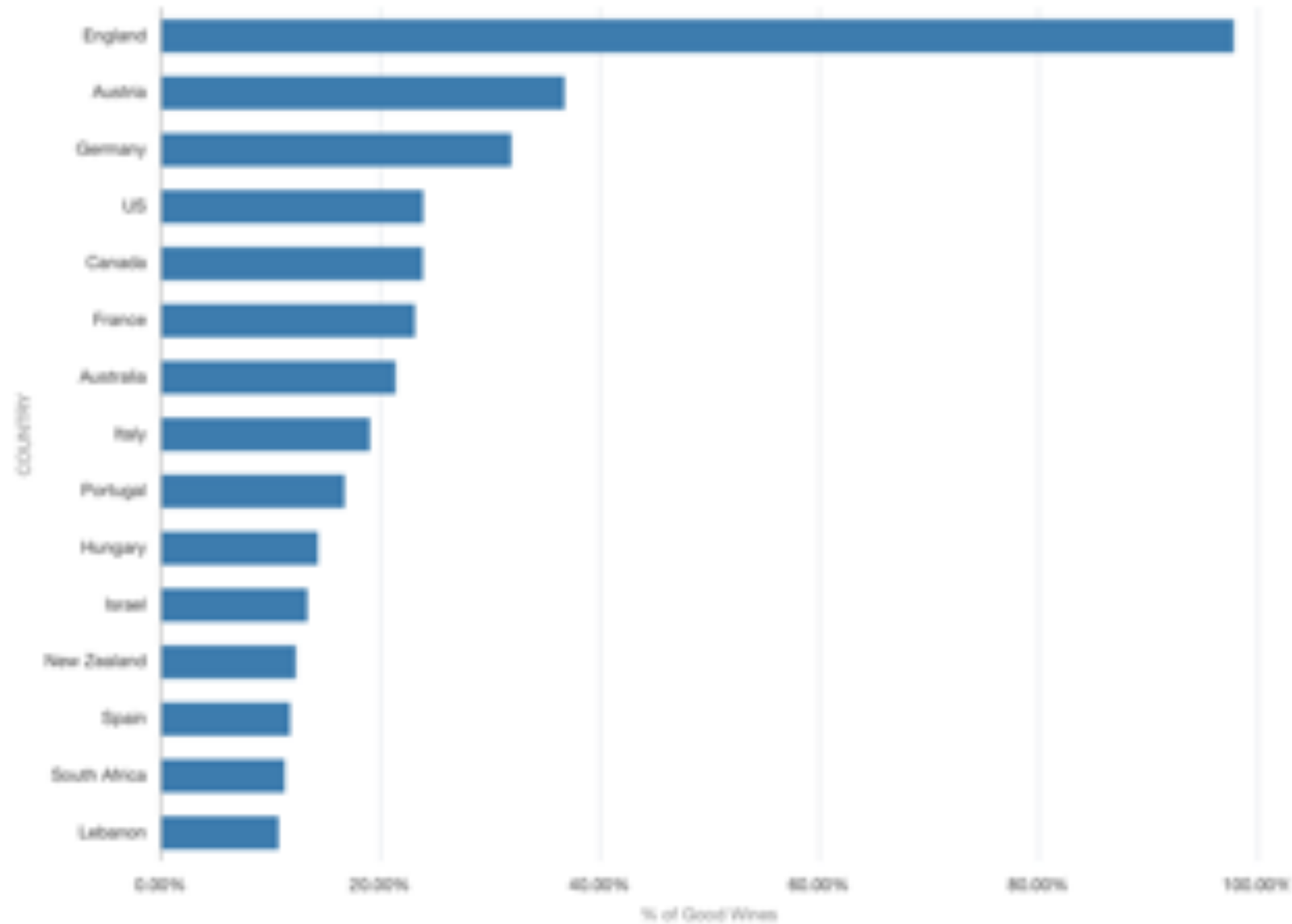
What Makes a Good Wine?



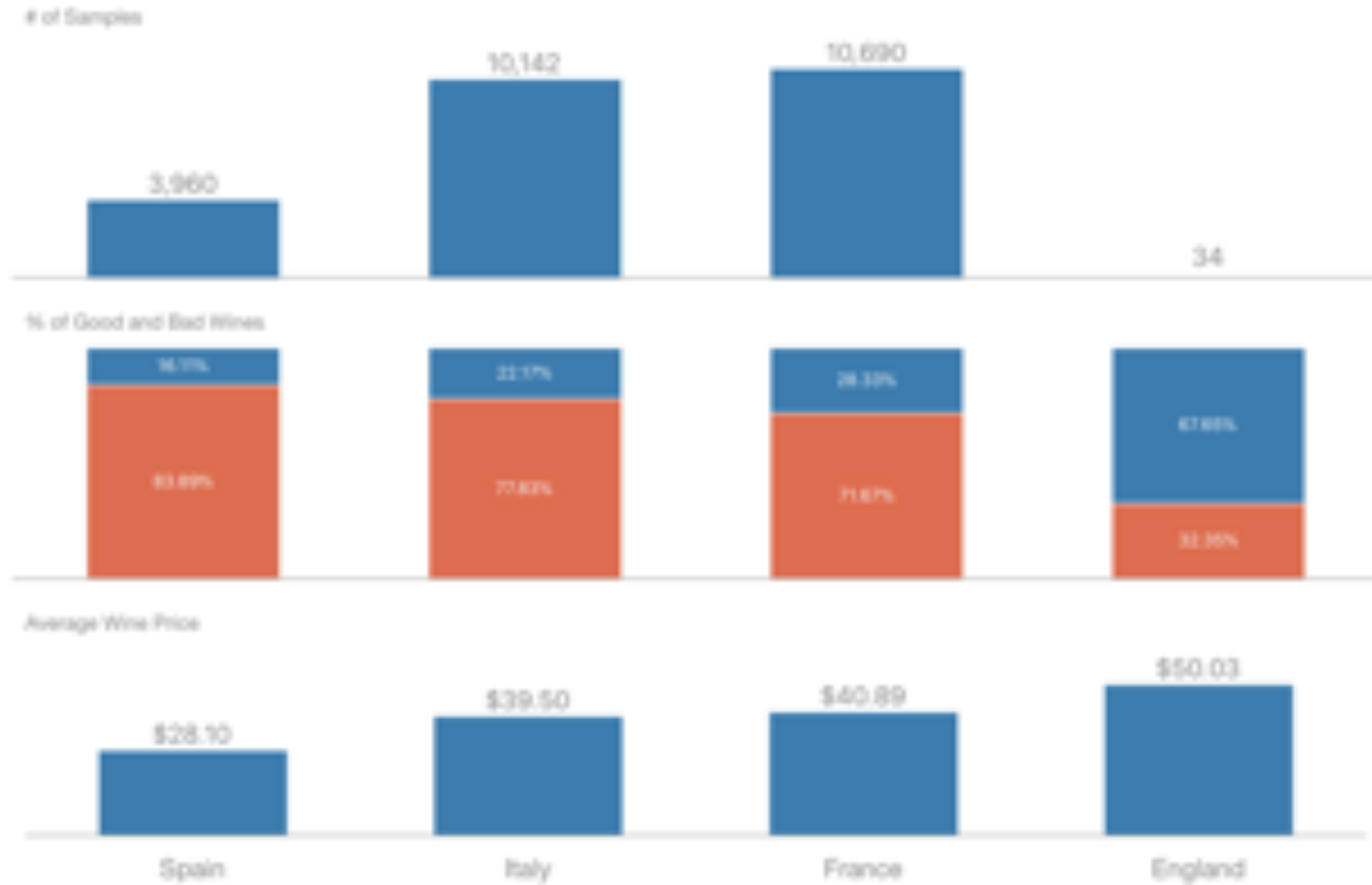
How Much Should I Spend for a Good Wine?



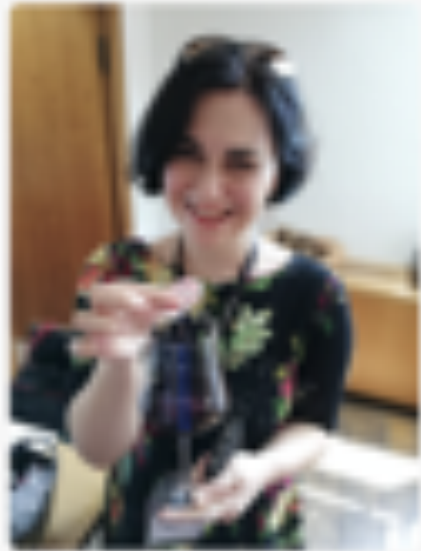
Which Country Makes the Best Wines?



Why England?????



Who Rated in England?



Anne Krebiehl MW

Date an MW: 2014
Based in: UK

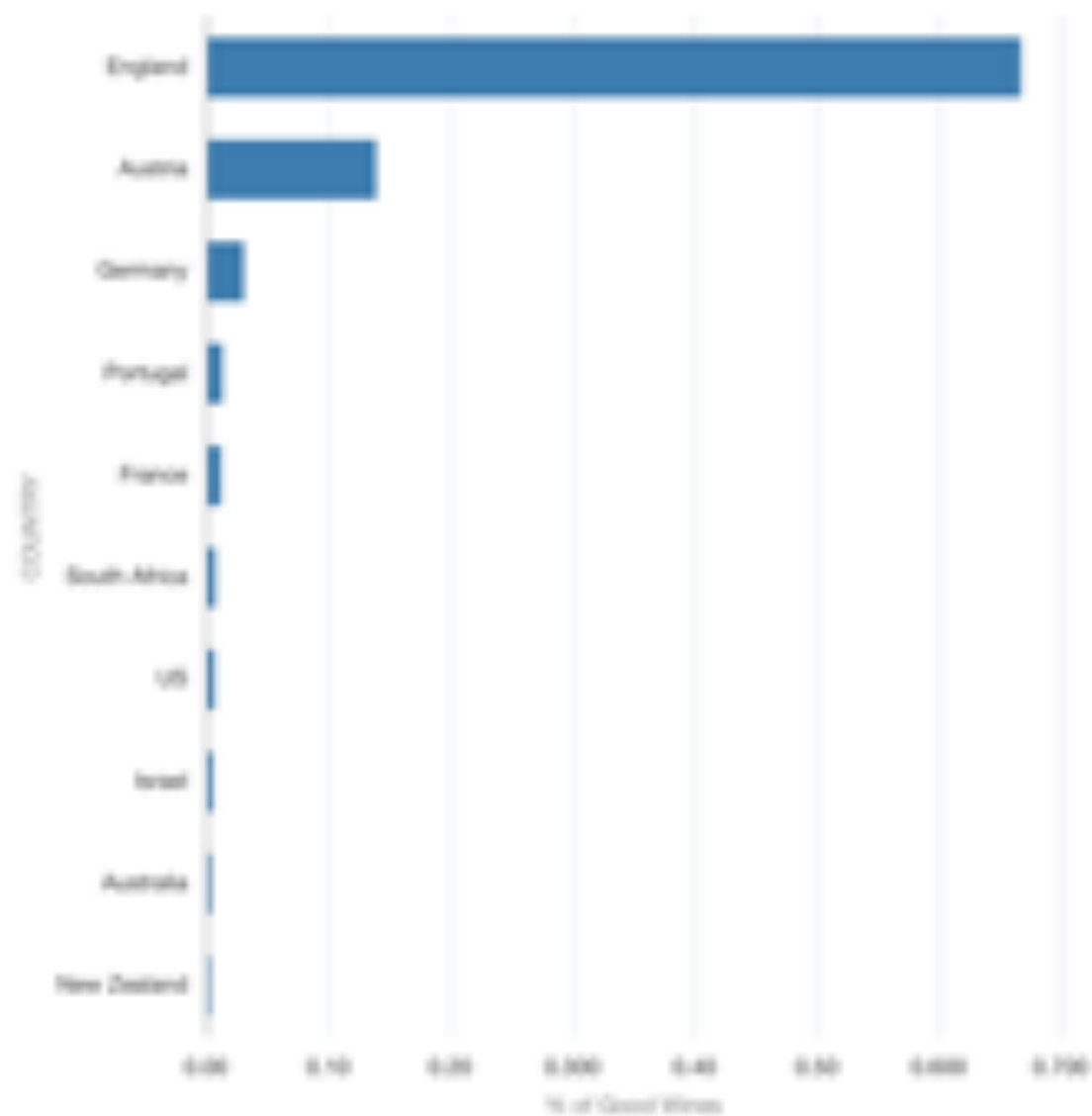


Anne Krebiehl MW 100.00%

What Should I Choose With Less Than 30\$?

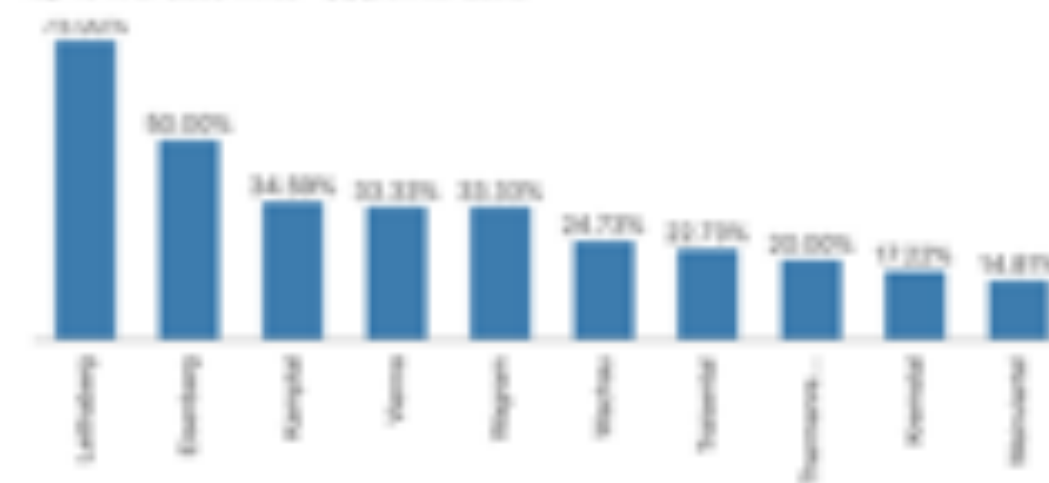
Top Countries

Top 10 % of Good Wines



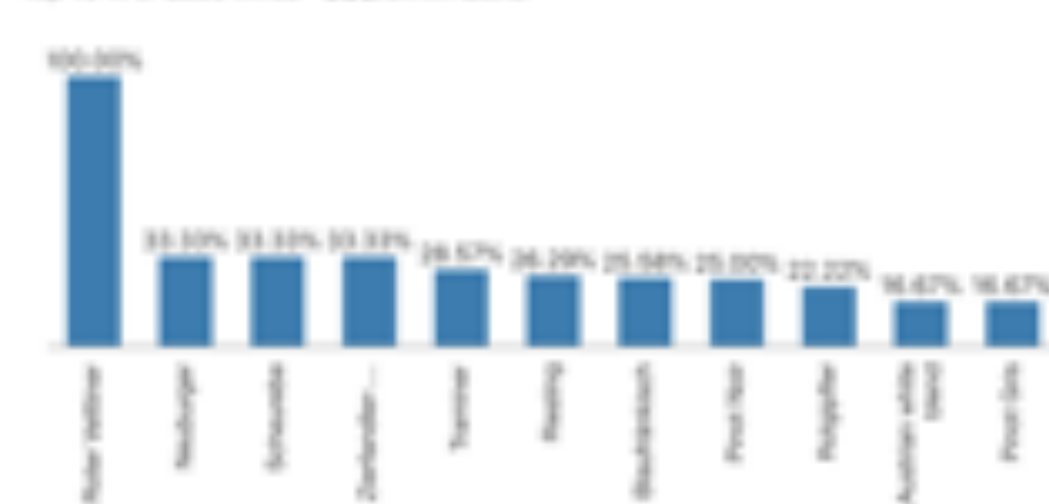
Province

Top 10 % of Good Wines - COUNTRY Austria



Variety

Top 10 % of Good Wines - COUNTRY Austria



Good Wines

COUNTRY Austria

DESCRIPTION	PRICE	PROBABILITY
1000-Emerberg Emeragl	20	72%
10	10	88%
Altagg	20	68%
Alte Felsen Emeragl	20	62%
Alte Felsen	17	84%
Alte Felsen	18	80%
Alte Felsen	18	72%
Alte Felsen	21	52%
Alte Felsen	20	57%
Alte Felsen Reserve	20	62%
Alte Felsen Reserve	20	62%
Altagg	18	88%
Altagg	20	82%
Alte Felsen	17	82%
Altagg	10	82%
Alte Felsen	18	72%
Alte Felsen	20	72%
Altagg	10	82%
Altagg	18	82%
Altagg	18	82%
Altagg	18	57%
Altagg	20	52%
Altagg	20	82%

ML MODEL DEPLOYMENT VIA ORDS REST API

Oracle Application Express
Oracle Application Express (APEX) provides a low-code development environment that enables you to build apps in a single, extensible platform, which is fully supported by Autonomous Database.

SQL Developer Web
Oracle SQL Developer Web provides a browser-based integrated development environment and administration interface for Oracle Autonomous Database. It provides a subset of the features available in the desktop product.

Oracle ML SQL Notebooks
Oracle Machine Learning SQL notebooks provide easy access to Oracle's parallelized, scalable in-database implementations of a library of Oracle Advanced Analytics' machine learning algorithms (classification, regression, anomaly detection, clustering, associations, attribute importance, feature extraction, times series, etc.), SQL, PL/SQL and Oracle's statistical and analytical SQL functions.

Download Oracle Instant Client
This is a free, light-weight set of tools, libraries and SDKs for building and connecting applications. These libraries underly the Oracle APIs of languages including Node.js, Python and PHP and provide access for OCI, OCI4J, JDBC, ODBC and Pro*C applications. Tools such as SQL*Plus and Oracle Data Pump are also included - Oracle recommends using this version of Data Pump for moving existing Oracle Database schemes to Autonomous Data Warehouse.

Autonomous Data Warehouse

Overview
Activity
Administration
Development

DATABASE
ADW2

Launch Development → APEX

Autonomous Data Warehouse

[Overview](#)[Activity](#)[Administration](#)[Development](#)

DATABASE
ADW2

Download Client Credentials (Wallet)

Connections to Autonomous Data Warehouse use a secure connection. Your existing tools and applications will need to use this wallet file to connect to your Autonomous Data Warehouse instance. If you are familiar with using an Oracle Database within your own data center, you may not have previously used these secure connections.

Set Administrator Password

Set or reset your database administrator user's (ADMIN) password and when locked unlock your administrator user account on Autonomous Data Warehouse.

Send Feedback to Oracle

Use our CloudCustomerConnect forum to provide feedback about the service to Oracle, post questions, connect with experts, and share your thoughts and ideas. [Click here](#) to link to the forum.

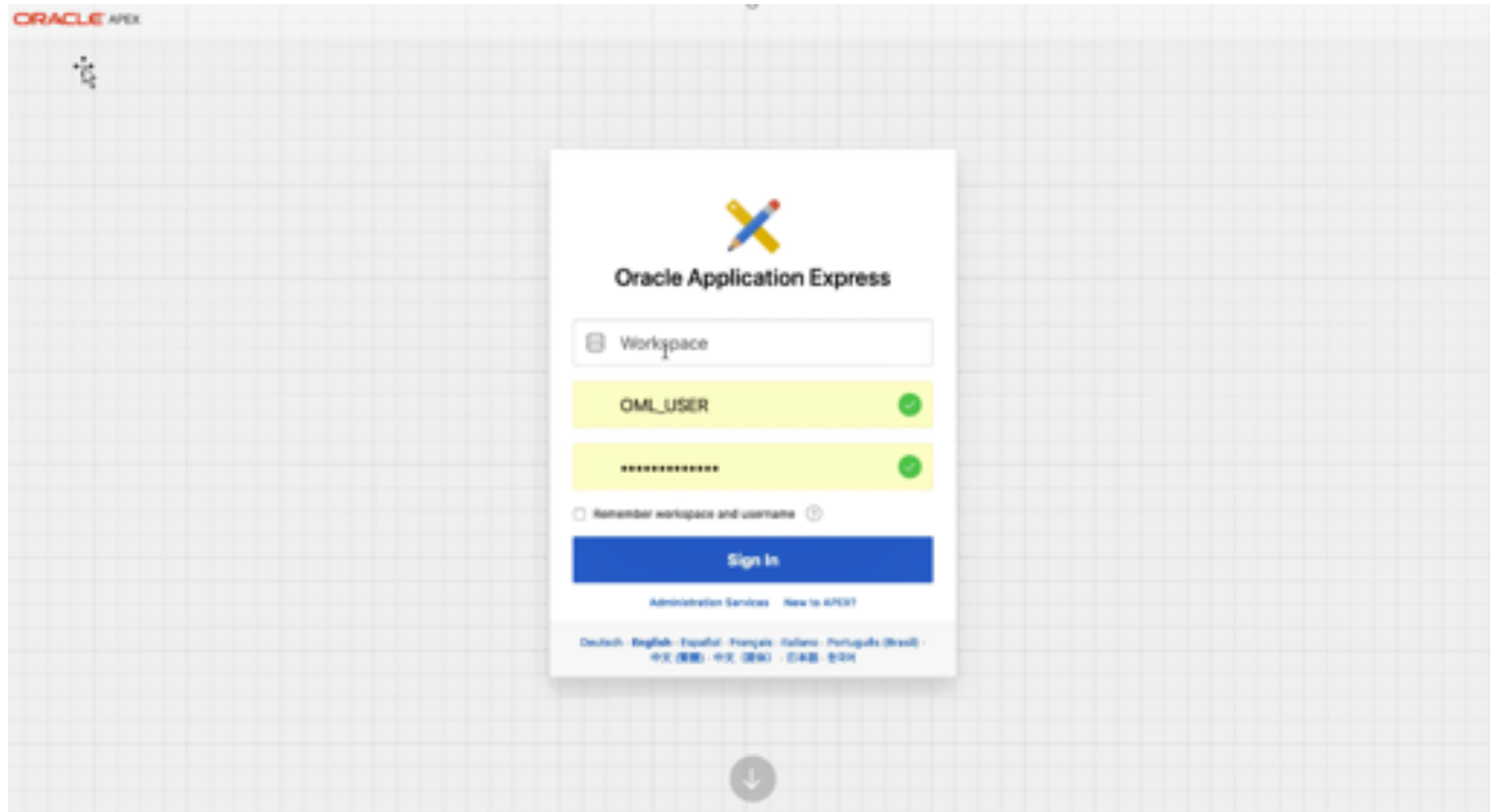
Set Resource Management Rules

Set resource management rules to allocate CPU/IO shares to consumer groups and to cancel SQL statements based on their runtime and amount of IO.

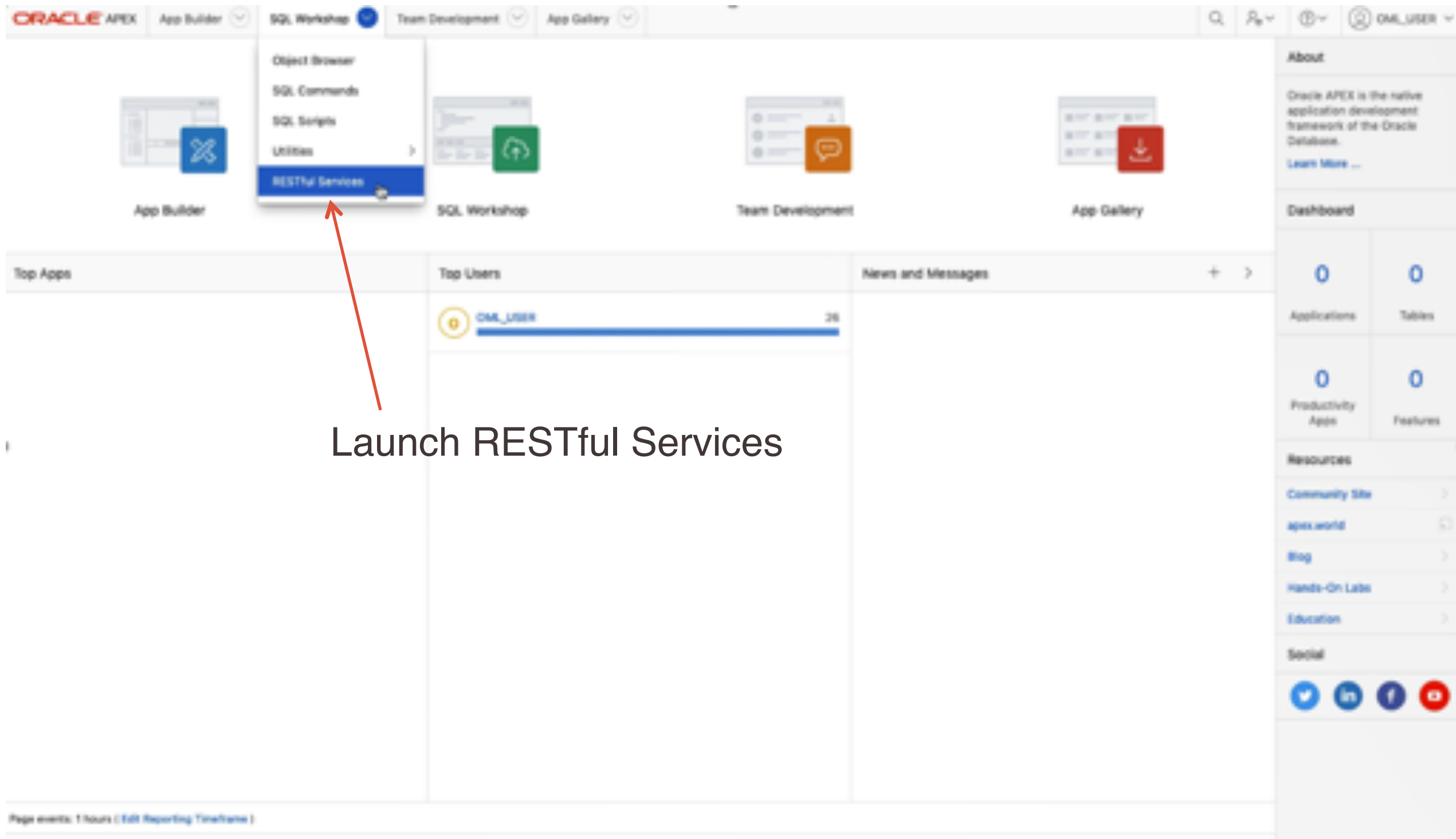
Manage Oracle ML Users

Create new Oracle Machine Learning user accounts and manage the credentials for existing Oracle Machine Learning users.

ML MODEL DEPLOYMENT VIA ORDS REST API



ML MODEL DEPLOYMENT VIA ORDS REST API



The screenshot shows the Oracle APEX dashboard interface. At the top, there is a navigation bar with tabs for 'App Builder', 'SQL Workshop', 'Team Development', and 'App Gallery'. The 'SQL Workshop' tab is active, and its dropdown menu is open, showing options: 'Object Browser', 'SQL Commands', 'SQL Scripts', 'Utilities', and 'RESTful Services'. A red arrow points to the 'RESTful Services' option. Below the navigation bar, there are several dashboard widgets: 'App Builder', 'SQL Workshop', 'Team Development', and 'App Gallery'. The main content area is divided into three columns: 'Top Apps', 'Top Users', and 'News and Messages'. The 'Top Users' column shows a bar chart for the user 'OML_USER' with a value of 28. The right sidebar contains sections for 'About', 'Dashboard', 'Resources', and 'Social'. The 'About' section describes Oracle APEX as the native application development framework. The 'Dashboard' section shows metrics for Applications, Tables, Productivity Apps, and Features. The 'Resources' section lists links to the Community Site, apex.world, Blog, Hands-On Labs, and Education. The 'Social' section includes icons for Twitter, LinkedIn, Facebook, and YouTube.

Launch RESTful Services

ML MODEL DEPLOYMENT VIA ORDS REST API

The screenshot shows the Oracle APEX RESTful Services configuration interface. At the top, the breadcrumb navigation includes 'RESTful Services' and 'ORDS RESTful Services'. The current schema is set to 'OAM_USER'. A yellow warning banner at the top right states: 'Schema not registered with ORDS. This schema has not been registered with ORDS RESTful Data Services. To register this schema click Register Schema with ORDS.' A blue button labeled 'Register Schema with ORDS' is visible in the banner.

In the center, a dialog box titled 'ORDS Schema Attributes' is open. It contains the following fields and options:

- Enable RESTful Access:** Radio buttons for 'Yes' (selected) and 'No'.
- Schema Alias:** A text input field containing 'oam_user'.
- Install Sample Service:** Radio buttons for 'Yes' and 'No'.

At the bottom of the dialog, there are 'Cancel' and 'Save Schema Attributes' buttons. A note below the 'Schema Alias' field reads: 'You are editing the alias for the workspace's default schema. Setting this alias will also change the Path Prefix at the workspace level. This will affect the URL for any APEX Based RESTful service you may have defined.'

ML MODEL DEPLOYMENT VIA ORDS REST API

ORACLE APEX App Builder SQL Workshop Team Development App Gallery

RESTful Services \ ORDS RESTful Services Schema OML_USER

RESTful Data Services

- Enabled Objects
- Modules
- Privileges
- Roles

Schema enabled for use with ORDS RESTful Services and sample RESTful Service successfully installed.

ORDS Version: 19.1.1.19081914

De-Register Schema from ORDS Reset Sample Service Import Export Configure

Schema Access	Metadata Access	Schema Aliased
Access Status ENABLED	Authorization Required DISABLED	Schema Alias emi_user

Modules	Privileges	Roles	Enabled Objects
Total Modules	Total Privileges	Total Roles	Total Enabled Objects

Module Status	Module Security	Object Aliases
		No RESTful Enabled Objects Found

Schema enables for ORDS RESTful Services

ML MODEL DEPLOYMENT VIA ORDS REST API

The screenshot shows the Oracle APEX interface for configuring an ORDS Handler Definition. The left sidebar shows a tree view of RESTful Data Services, with the 'employees/' module selected. The main panel displays the configuration for the 'employees/' module, including the RESTful Service Module, Module Base Path, URL Template, Full URL, Method, Source Type, Format, and Pagination Size. The Source field contains a SQL query that selects employee data and uses a window function to rank employees by salary.

Helpful example templates provided

```
1 select empno "Surf", rn, empno, ename, job, hiredate, mgr, sal, comm, deptno
2 from (
3     select emp.*
4           , row_number() over (order by empno) rn
5     from emp
6 ) tmp
```


ML MODEL DEPLOYMENT VIA ORDS REST API

Build your own custom API
For What-IF ML predictions / Scoring
– micro-services

```
1 select prediction(wine_CLASS_MODEL USING
2     country as country,
3     province as province,
4     price as price,
5     variety as variety) pred_wine,
6     prediction_probability(wine_CLASS_MODEL USING
7     country as country,
8     province as province,
9     price as price,
10    variety as variety) prob_wine
11 from dual
```

ML MODEL DEPLOYMENT VIA ORDS REST API

```
localhost:8888/notebooks/OOW19_ADW_Demo.ipynb#
jupyter OOW19_ADW_Demo Last Checkpoint: 41 minutes ago (unsaved changes)
Trusted Python 3

In [20]: import json
import requests

country = 'Portugal'
province = 'Douro'
variety = 'Portuguese Red'
price = '30'

resp = requests.get('https://jggalbb6iptk8qum-adv2.adb.us-ashburn-1.oraclecloudapps.com/ords/o11_user/wine/wine_pred/' +
json_data = resp.json()
print (json.dumps(json_data, indent=2))

country = 'Portugal'
province = 'Douro'
variety = 'Portuguese Red'
price = '31'

resp = requests.get('https://jggalbb6iptk8qum-adv2.adb.us-ashburn-1.oraclecloudapps.com/ords/o11_user/wine/wine_pred/' +
json_data = resp.json()
print (json.dumps(json_data, indent=2))

{
  "pred_wine": "LT_90_POINTS",
  "prob_wine": 0.6844716987704507
}
{
  "pred_wine": "GT_90_POINTS",
  "prob_wine": 0.5137163891143298
}
```

RESTful API for calling
OML model to make predictions

REAL-TIME WINE RECOMMENDATION APP + OPENDININGTABLE APP

Get expert opinions before
choosing a wine



Discover new wines and find
your next favorite



SUMMARY

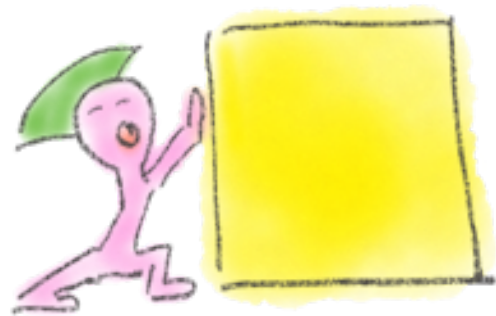
ML IN DATABASE



SECURITY



GOVERNANCE

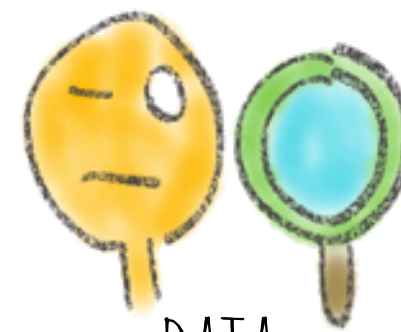


PROD
DEPLOYMENT



KNOWLEDGE
SHARING

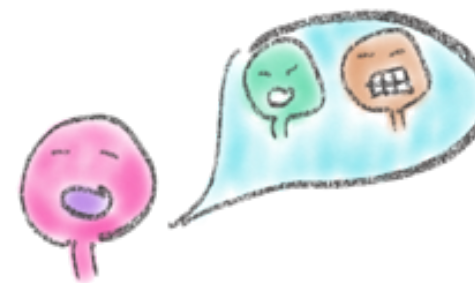
ANALYTICS



DATA
EXPLORATION



VISUALISATIONS

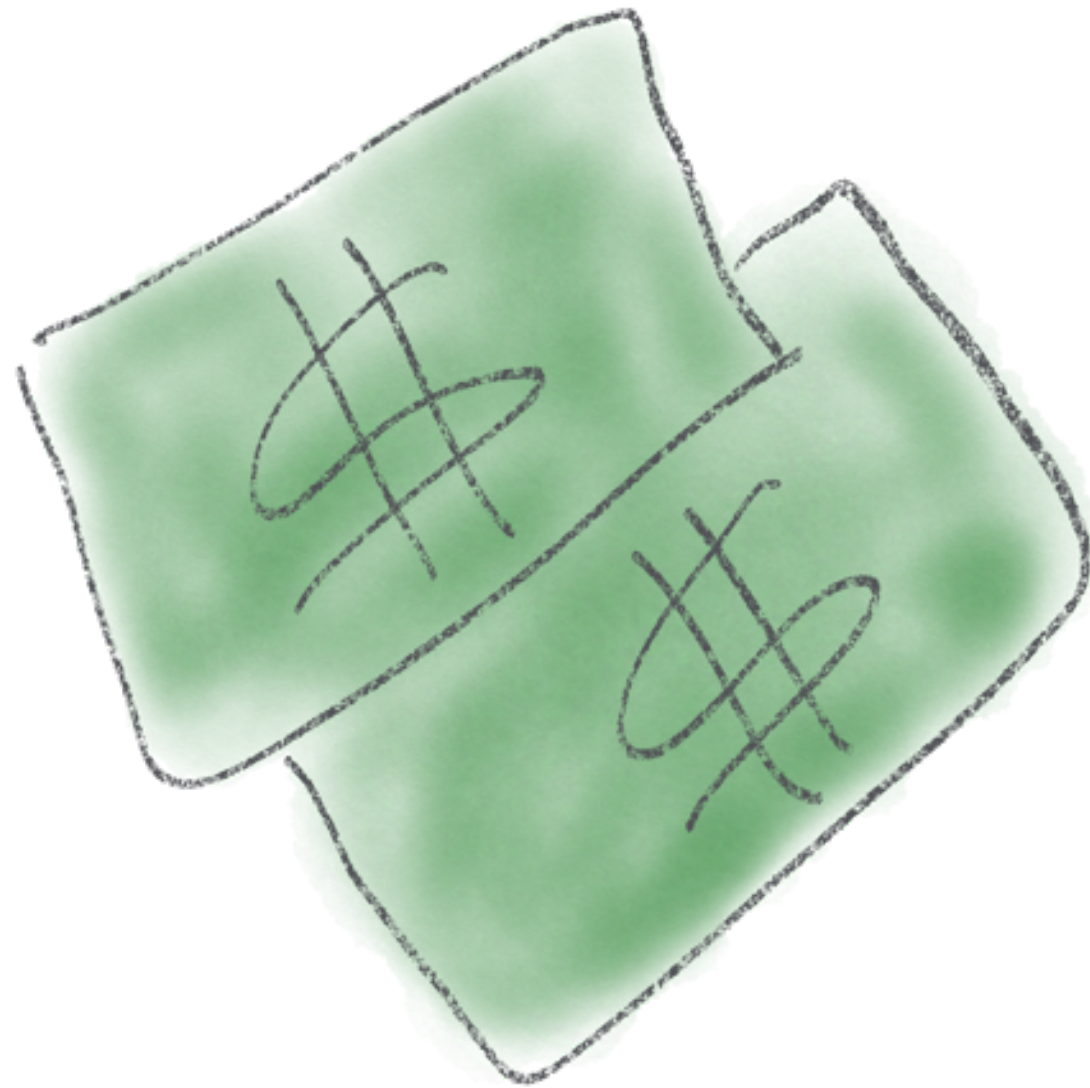


STORYTELLING



EASY REUSE

WHAT ABOUT THE MONEY?



FREE!

PICKING A GOOD **WINE** FOR UNDER \$30
USING ADW, ORACLE MACHINE LEARNING,
OAC

FRANCESCO TISIOT
BRENDAN TIERNEY

RITTMAN MEAD
ORALYTICS

 @FTISIOT
 @BRENDANTIERNEY