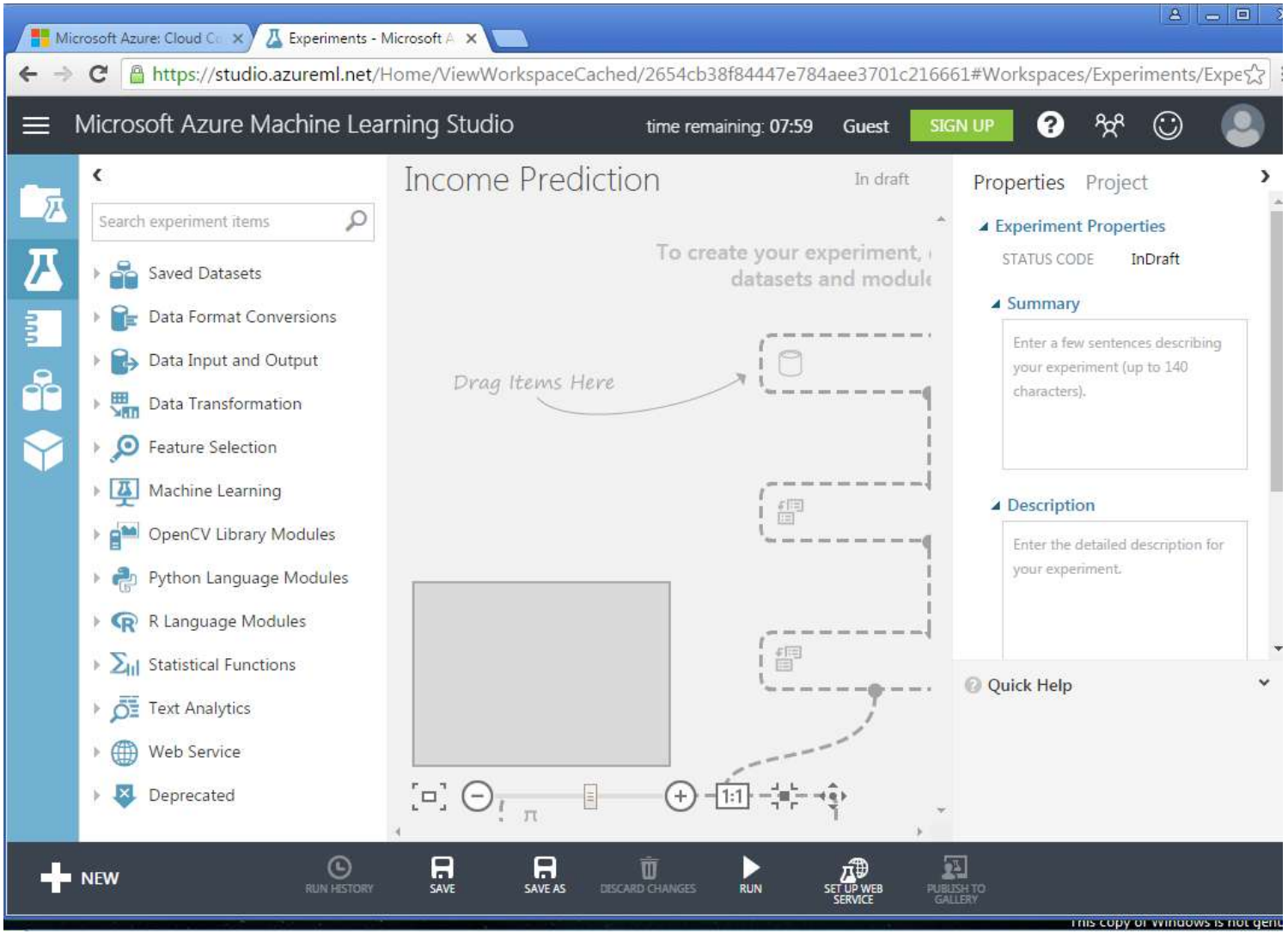
Büyük Veri Uygulamaları – Ders 7

Doç. Dr. Yuriy Mishchenko

Plan

- Azure ML hizmeti kullanılmasına bir pratik giriş

MS Azure ML

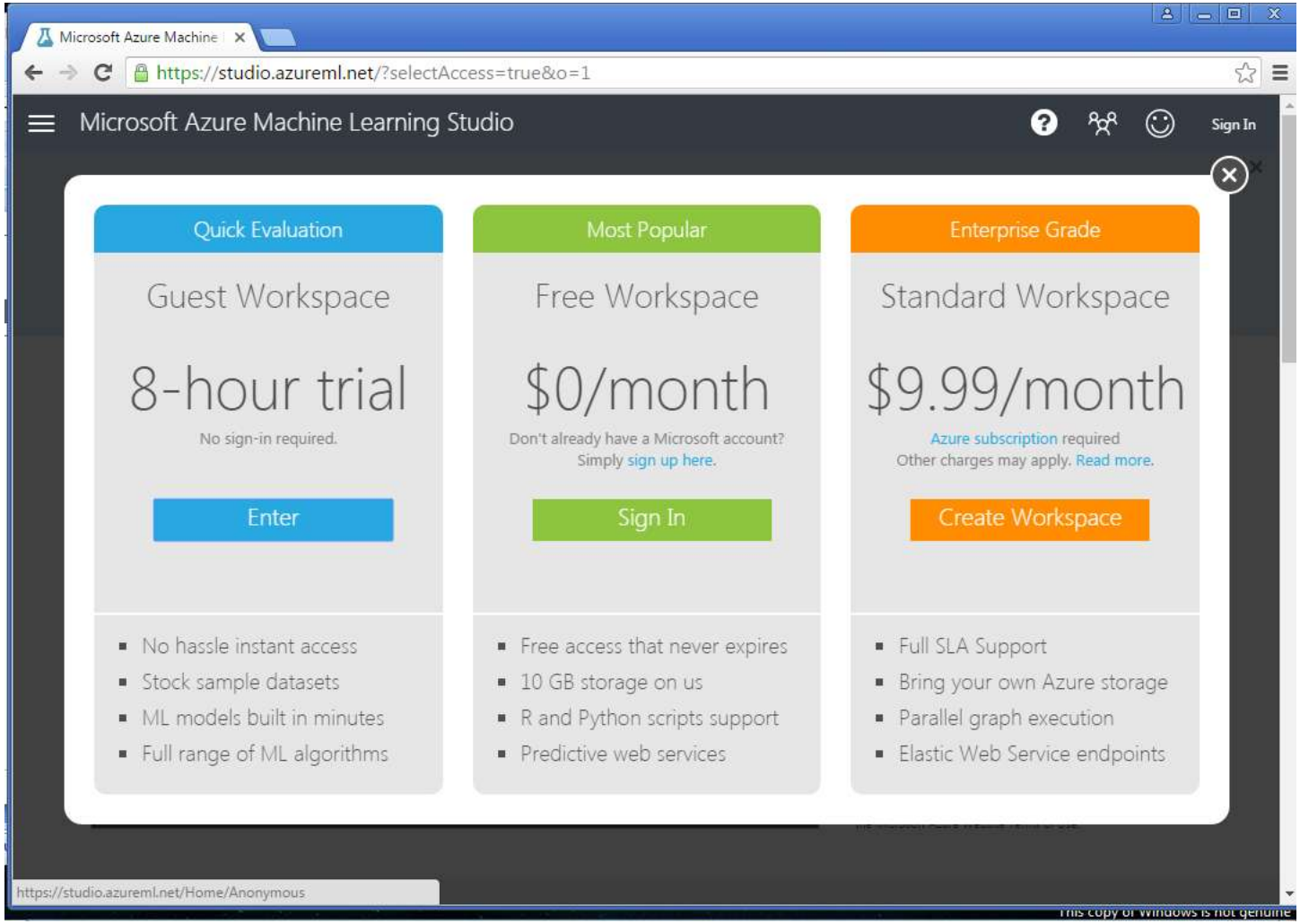

Microsoft Azure: Cloud C
Experiments - Microsoft A
https://studio.azureml.net/Home/ViewWorkspaceCached/2654cb38f84447e784aee3701c216661#Workspaces/Experiments/Expe
Microsoft Azure Machine Learning Studio
time remaining: 07:59
Guest
SIGN UP
Income Prediction
In draft
Search experiment items
Saved Datasets
Data Format Conversions
Data Input and Output
Data Transformation
Feature Selection
Machine Learning
OpenCV Library Modules
Python Language Modules
R Language Modules
Statistical Functions
Text Analytics
Web Service
Deprecated
To create your experiment,
datasets and module
Drag Items Here
Properties
Project
Experiment Properties
STATUS CODE
InDraft
Summary
Enter a few sentences describing your experiment (up to 140 characters).
Description
Enter the detailed description for your experiment.
Quick Help
NEW
RUN HISTORY
SAVE
SAVE AS
DISCARD CHANGES
RUN
SET UP WEB SERVICE
PUBLISH TO GALLERY

MS Azure ML

- Azure Microsoft tarafından sağlanan bulut hesaplama hizmetleri
- MS Azure birçok hizmet vermektedir – web ve mobil uygulamaları, sanal makine kullanılarak hesaplama, veri analitiks, depolama, İOT ve sayre

MS Azure ML

- Makine öğrenme hizmeti (Azure ML studio) Azure'nin "Analytics hizmetleri" kapsamında sunulmakta dır
- Azure ML hizmeti, verilerinize göre ML modellerinin üretilmesi ve onlar kullanılarak her tür tahmin üretilmesine imkan sağlar
- Azure ML hizmeti kulllanmak için, şu anda üç seçenek var – 8 saat tamamen ücretsiz deneme "Guest" hesabı, ücretsiz sınırlı hesabı, ücretli hesabı
- Amaçlarımızla ücretsiz 8 saat deneme uygundur

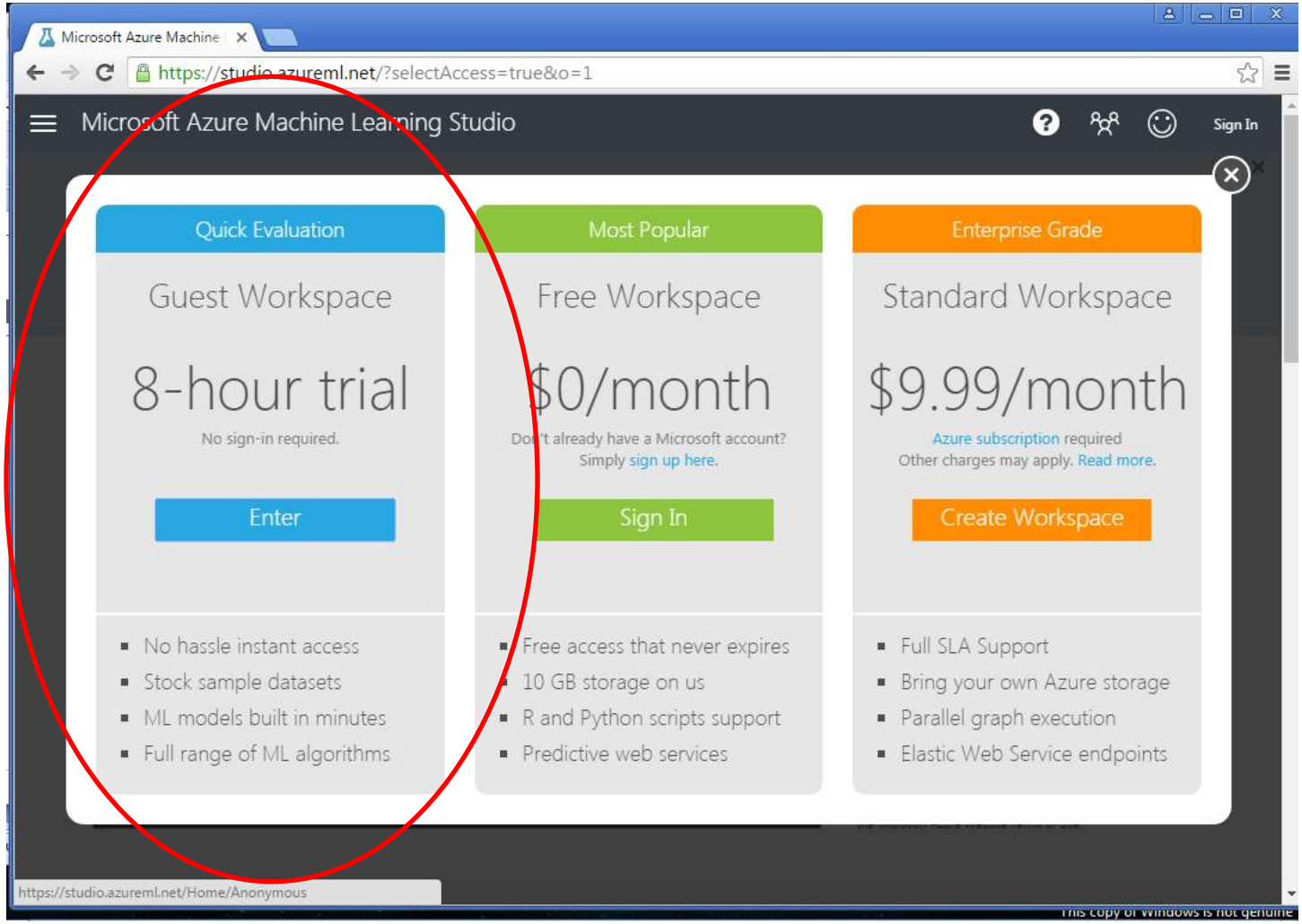

Microsoft Azure Machine
https://studio.azureml.net/?selectAccess=true&o=1
Microsoft Azure Machine Learning Studio
Sign In
Quick Evaluation
Guest Workspace
8-hour trial
No sign-in required.
Enter
No hassle instant access
Stock sample datasets
ML models built in minutes
Full range of ML algorithms
Most Popular
Free Workspace
$0/month
Don't already have a Microsoft account?
Simply sign up here.
Sign In
Free access that never expires
10 GB storage on us
R and Python scripts support
Predictive web services
Enterprise Grade
Standard Workspace
$9.99/month
Azure subscription required
Other charges may apply. Read more.
Create Workspace
Full SLA Support
Bring your own Azure storage
Parallel graph execution
Elastic Web Service endpoints
https://studio.azureml.net/Home/Anonymous

MS Azure ML

- MS Azure ML deneme kullanımı tamamen ücretsiz ve veri indirme, model oluşturma ve model değerlendirme gibi tüm model oluşturma aşamaları gerçekleştirebilmektedir

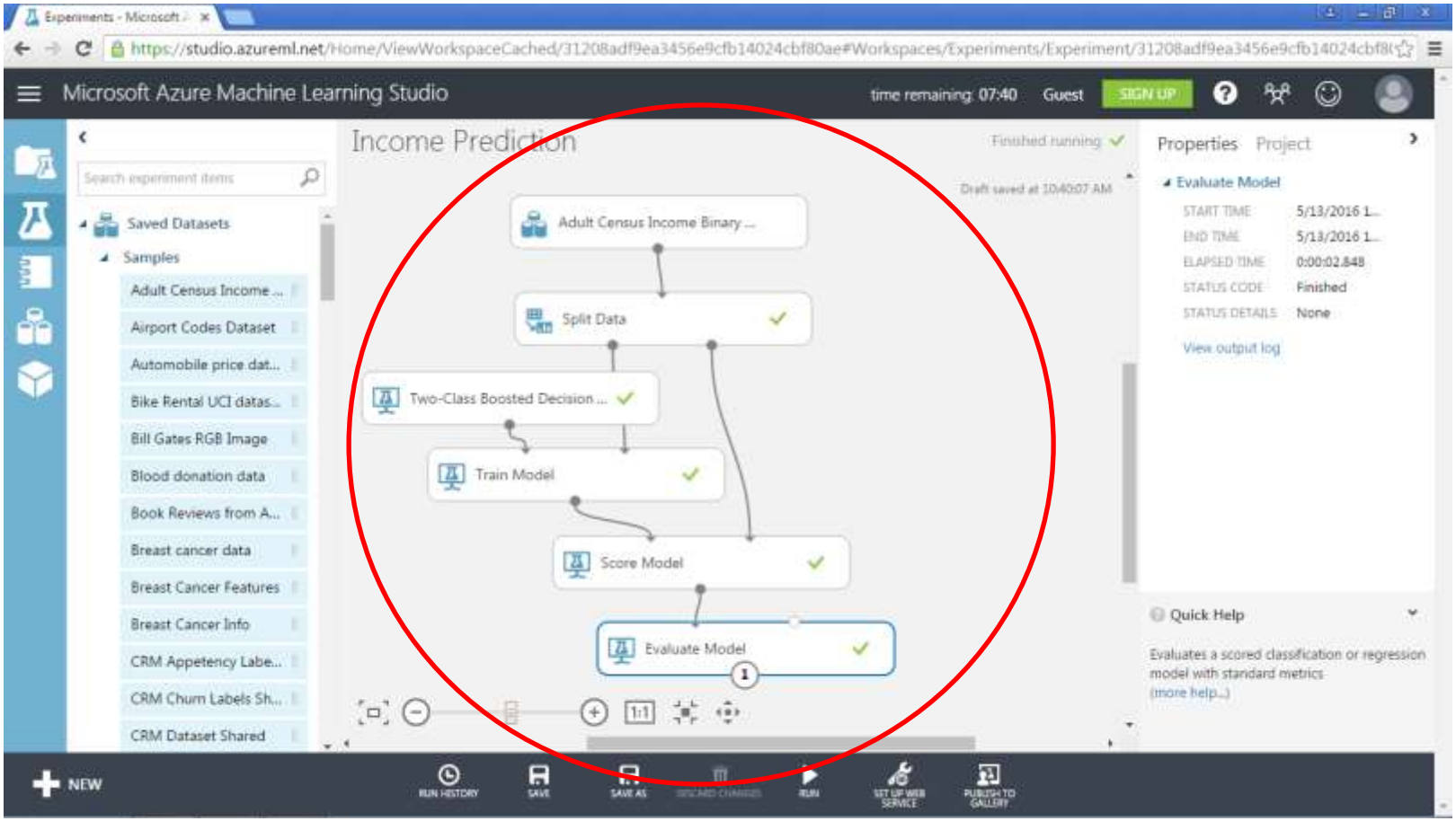
MS Azure ML

- MS Azure ML hizmeti, Google'da "Azure ML" diye arama yapıp ve ilgili MS Azure ML ana sayfasından giriş yapıp, 8 saat deneme hesabı seçilmesiyle kullanılabilmektedir


Microsoft Azure Machine
https://studio.azureml.net/?selectAccess=true&o=1
Microsoft Azure Machine Learning Studio
Sign In
Quick Evaluation
Guest Workspace
8-hour trial
No sign-in required.
Enter
No hassle instant access
Stock sample datasets
ML models built in minutes
Full range of ML algorithms
Most Popular
Free Workspace
$0/month
Don't already have a Microsoft account?
Simply sign up here.
Sign In
Free access that never expires
10 GB storage on us
R and Python scripts support
Predictive web services
Enterprise Grade
Standard Workspace
$9.99/month
Azure subscription required
Other charges may apply. Read more.
Create Workspace
Full SLA Support
Bring your own Azure storage
Parallel graph execution
Elastic Web Service endpoints
https://studio.azureml.net/Home/Anonymous

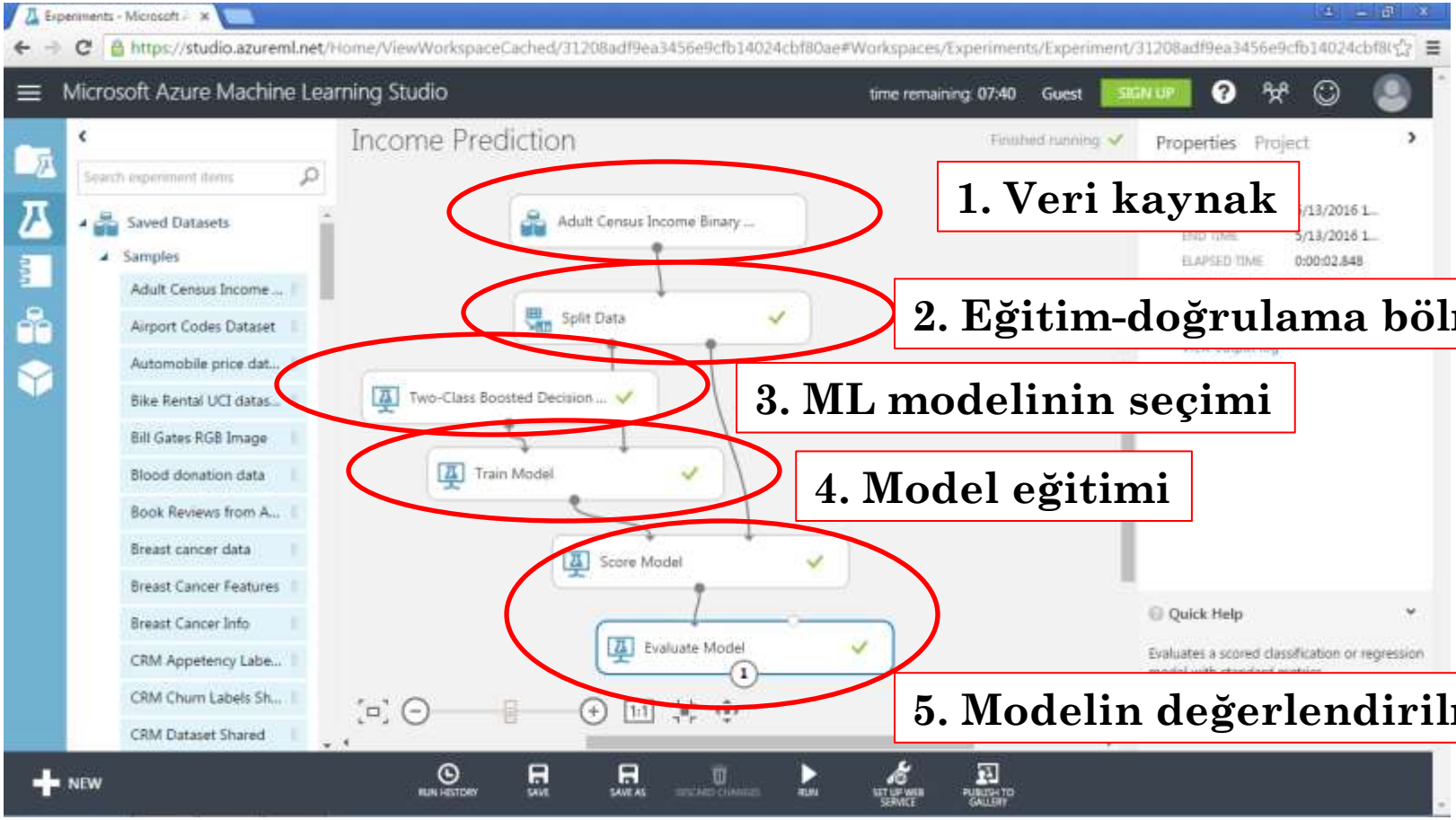
MS Azure ML

- MS Azure ML sistemi Amazon ML sistemine göre farklı kullanım modeli kullanmakta
- MS Azure ML veri modelleme işlemleri bir işlem sırasının graf/diagram olarak oluşturulur
- Bu diagramın baze kısımları olarak, veri indirme, veri hazırlama, model oluşturma, model değerelendirme gibi tüm işlemler görsel şekilde seçilir ve bağlanır


Microsoft Azure Machine Learning Studio
time remaining: 07:40
Guest
SIGN UP
Income Prediction
Finished running
Draft saved at 10:40:07 AM
Properties
Project
Evaluate Model
START TIME 5/13/2016 1...
END TIME 5/13/2016 1...
ELAPSED TIME 0:00:02.848
STATUS CODE Finished
STATUS DETAILS None
View output log
Search experiment items
Saved Datasets
Samples
Adult Census Income ...
Airport Codes Dataset
Automobile price dat...
Bike Rental UCI datas...
Bill Gates RGB Image
Blood donation data
Book Reviews from A...
Breast cancer data
Breast Cancer Features
Breast Cancer Info
CRM Appetency Labe...
CRM Churn Labels Sh...
CRM Dataset Shared
Adult Census Income Binary ...
Split Data
Two-Class Boosted Decision ...
Train Model
Score Model
Evaluate Model
Quick Help
Evaluates a scored classification or regression model with standard metrics
(more help...)
NEW
RUN HISTORY
SAVE
SAVE AS
RUN
SET UP WEB SERVICE
PUBLISH TO GALLERY

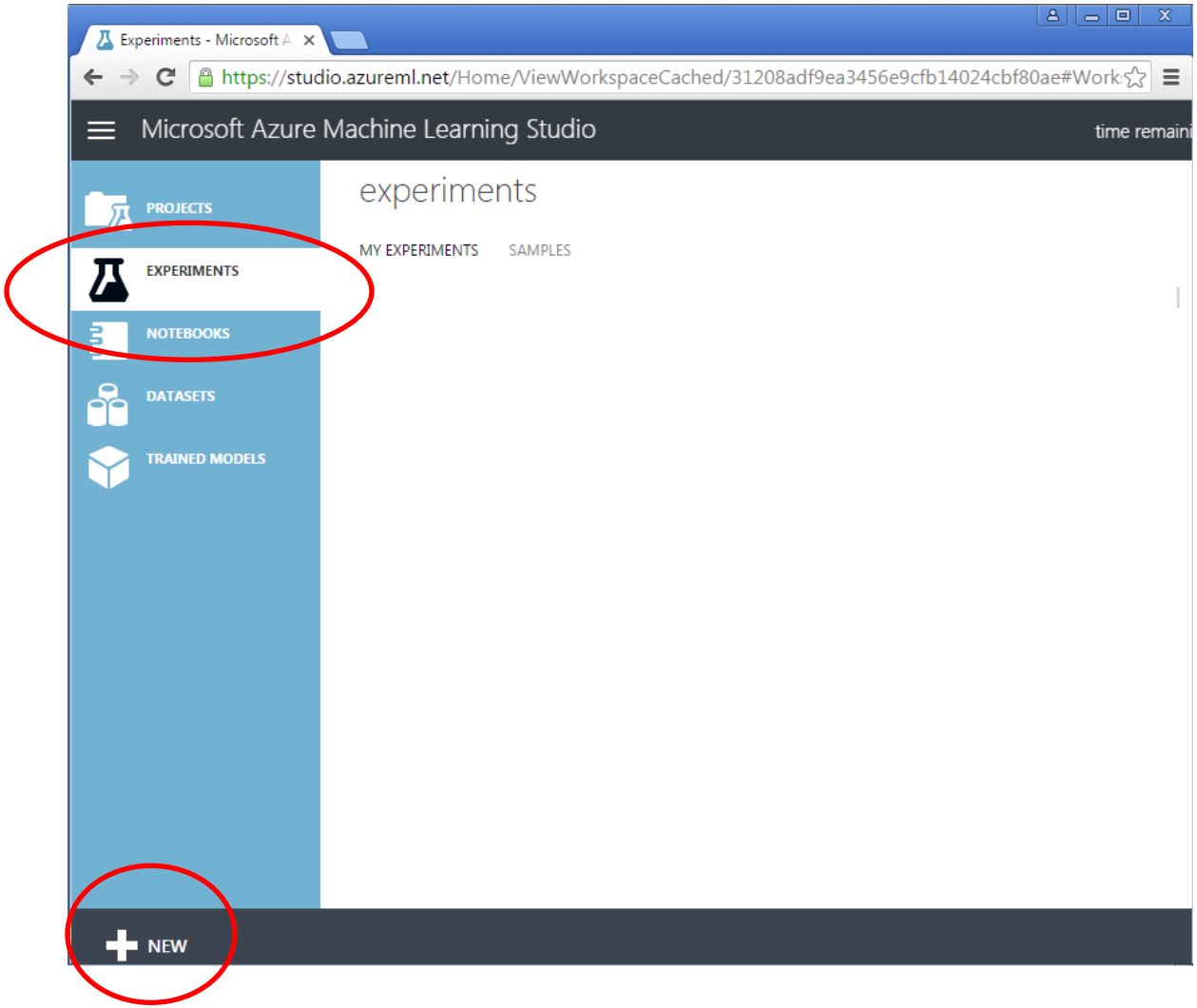
MS Azure ML

- Herhangi Azure ML diagramatik model en azından şu aşamadan oluşur;
  - Veri kaynağı
  - Veri eğitim-doğrulama kümelerine bölme
  - ML model seçimi
  - ML model eğitimi
  - ML modeli uygulanması ve değerlendirilmesi


Microsoft Azure Machine Learning Studio
Income Prediction
Adult Census Income Binary ...
Split Data
Two-Class Boosted Decision ...
Train Model
Score Model
Evaluate Model
1. Veri kaynak
2. Eğitim-doğrulama bölmesi
3. ML modelinin seçimi
4. Model eğitimi
5. Modelin değerlendirilmesi

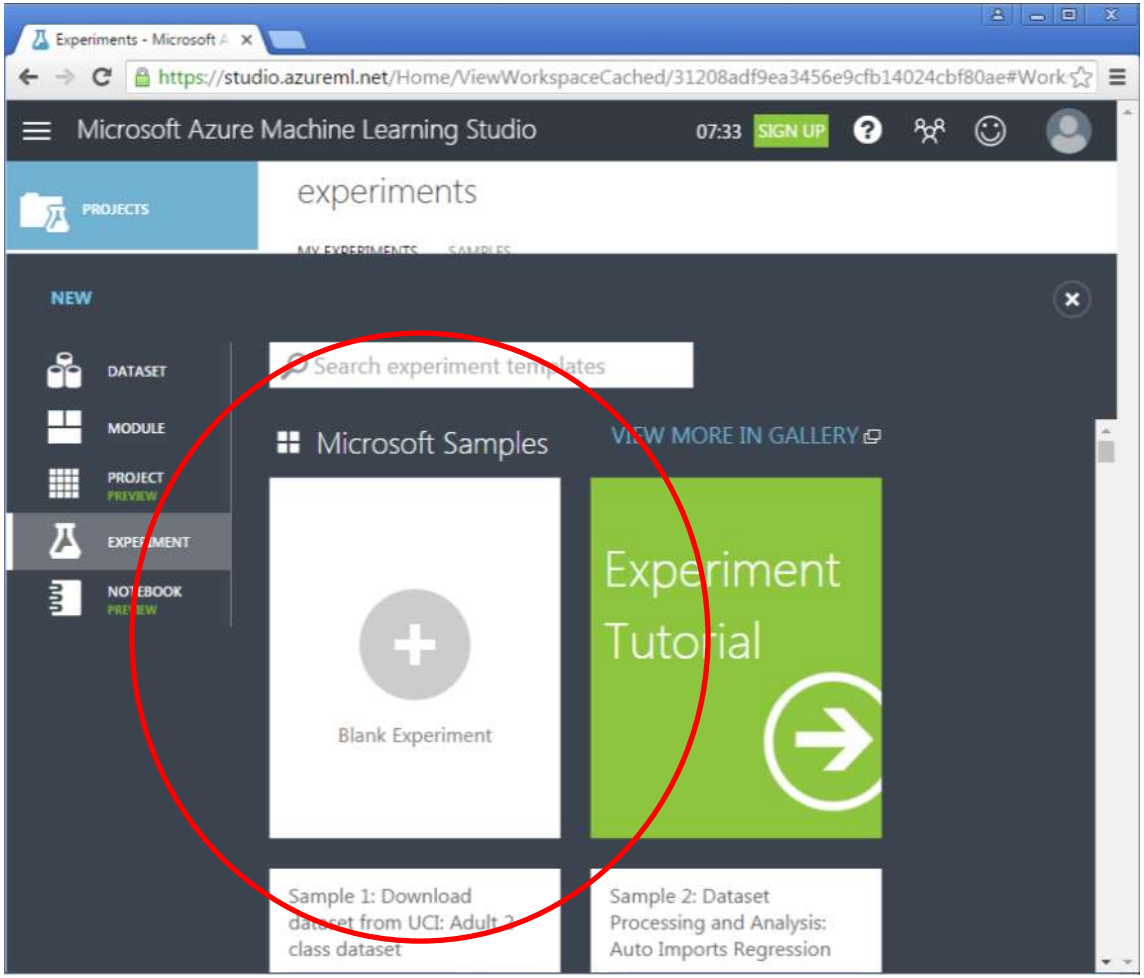
MS Azure ML

- Yeni bir modeli oluşturmak için, Azüre ML Studio ana sayfasından “Experiments” (Deneyler) menüsü altında yeni deney düğme basılmalı


Experiments - Microsoft A
https://studio.azureml.net/Home/ViewWorkspaceCached/31208adf9ea3456e9cfb14024cbf80ae#Work
Microsoft Azure Machine Learning Studio
time remaini
PROJECTS
EXPERIMENTS
NOTEBOOKS
DATASETS
TRAINED MODELS
experiments
MY EXPERIMENTS
SAMPLES
NEW

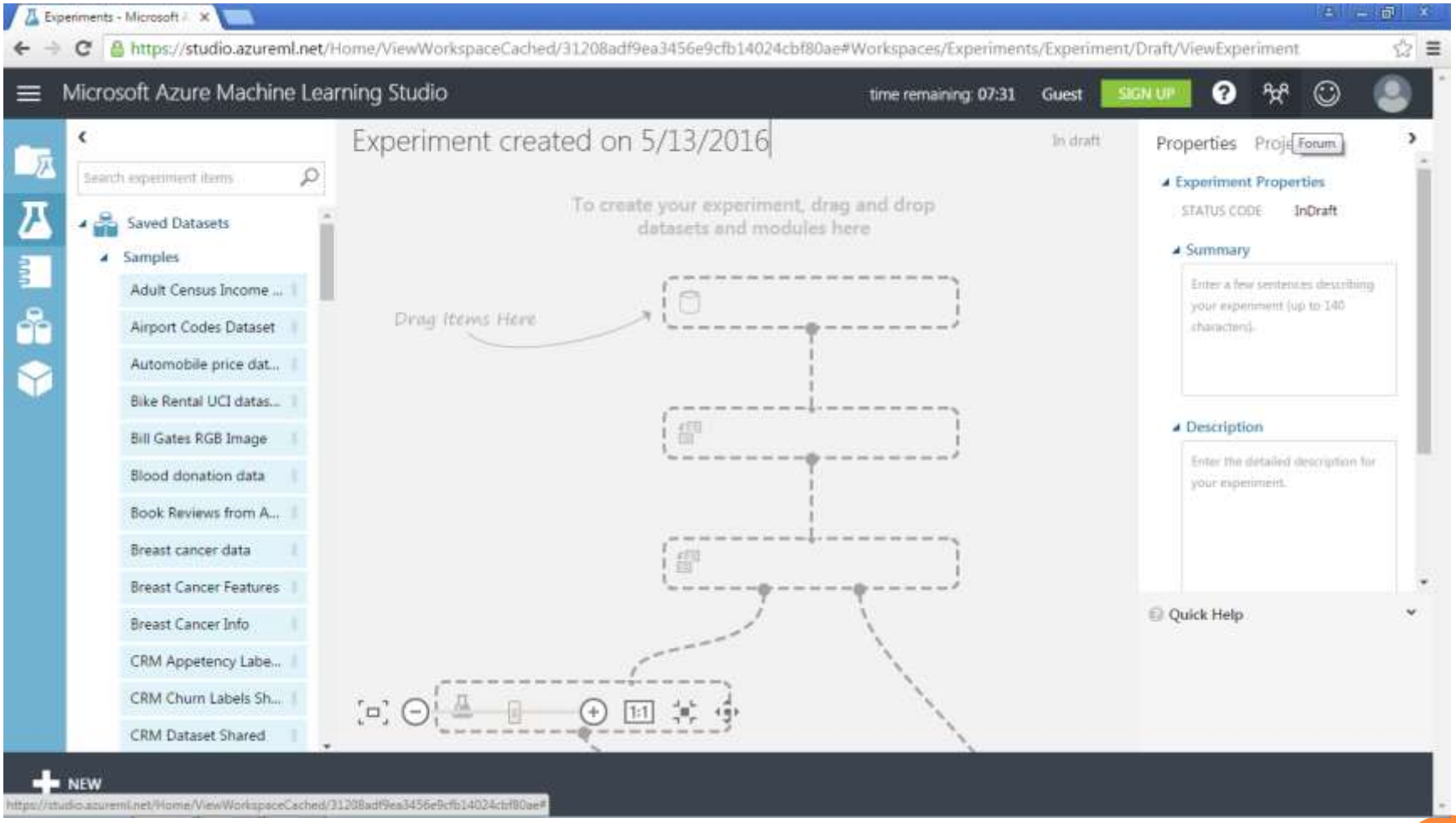
MS Azüre ML

- Yeni deney menüsünde birçok seçenek var, sırasında “tutorial” örneği ve birçok “sample” örnek mevcuttur
- Kendiniz verileri işletmek için, “Blank Experiment” yani boş deney seçenek seçiyoruz


Experiments - Microsoft
https://studio.azureml.net/Home/ViewWorkspaceCached/31208adf9ea3456e9cfb14024cbf80ae#Work
Microsoft Azure Machine Learning Studio
07:33
SIGN UP
PROJECTS
experiments
NEW
DATASET
MODULE
PROJECT
PREVIEW
EXPERIMENT
NOTEBOOK
Search experiment templates
Microsoft Samples
VIEW MORE IN GALLERY
Blank Experiment
Experiment Tutorial
Sample 1: Download dataset from UCI: Adult 2 class dataset
Sample 2: Dataset Processing and Analysis: Auto Imports Regression

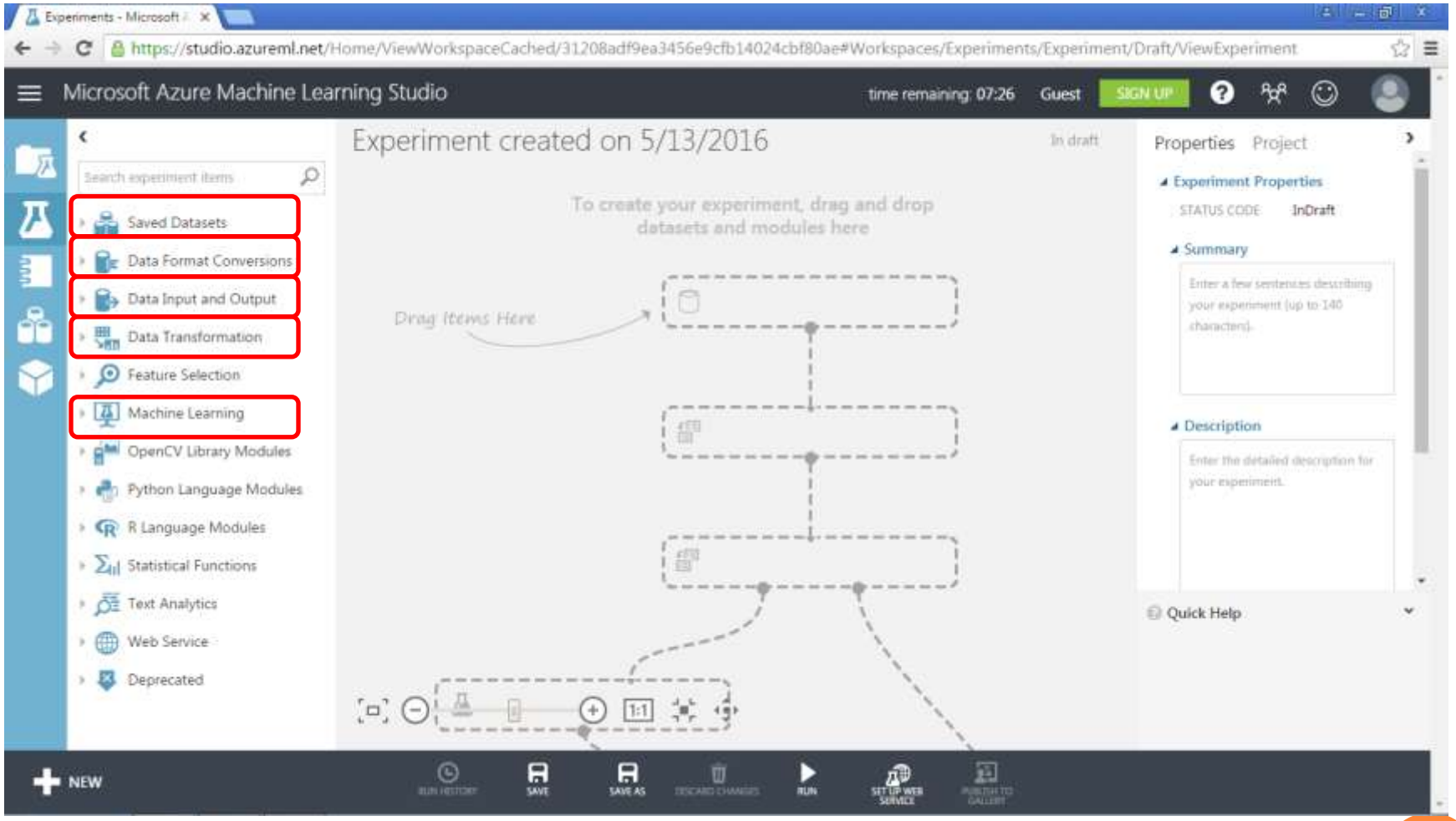
MS Azure ML

- Boş deney oluşturulduğunda yardımcı olmak üzere bir “Help” ekranı gösterilmektedir
- Bu ekranda diagramatik modellerin temel kısımları ve ilgili model oluşturma işlem sırası gösterilmektedir


Experiments - Microsoft
https://studio.azureml.net/Home/ViewWorkspaceCached/31208adf9ea3456e9cfb14024cbf80ae#Workspaces/Experiments/Experiment/Draft/ViewExperiment
Microsoft Azure Machine Learning Studio
time remaining: 07:31
Guest
SIGN UP
Experiment created on 5/13/2016
In draft
Search experiment items
Saved Datasets
Samples
Adult Census Income ...
Airport Codes Dataset
Automobile price dat...
Bike Rental UCI datas...
Bill Gates RGB Image
Blood donation data
Book Reviews from A...
Breast cancer data
Breast Cancer Features
Breast Cancer Info
CRM Appetency Labe...
CRM Churn Labels Sh...
CRM Dataset Shared
To create your experiment, drag and drop datasets and modules here
Drag Items Here
Properties
Proje
Forum
Experiment Properties
STATUS CODE
InDraft
Summary
Enter a few sentences describing your experiment (up to 140 characters).
Description
Enter the detailed description for your experiment.
Quick Help
1:1
NEW

MS Azure ML

- Oluşturulacak diagram modellerinin elemanları sağ menüde mevcuttur
- Bunlar birçok kategori altına sınıflandırılmış. Bizim için bu aşamada gereken onları şunlar;
  - Saved Datasets – hazır olan veri örnekleri
  - Data Input and Output – veri yükleme ve indirme
  - Data Transformation – veri dönüşümleri
  - Machine Learning – makine öğrenme yöntemleri


Experiments - Microsoft
https://studio.azureml.net/Home/ViewWorkspaceCached/31208adf9ea3456e9cfb14024cbf80ae#Workspaces/Experiments/Experiment/Draft/ViewExperiment
Microsoft Azure Machine Learning Studio
time remaining: 07:26
Guest
SIGN UP
Experiment created on 5/13/2016
In draft
Search experiment items
Saved Datasets
Data Format Conversions
Data Input and Output
Data Transformation
Feature Selection
Machine Learning
OpenCV Library Modules
Python Language Modules
R Language Modules
Statistical Functions
Text Analytics
Web Service
Deprecated
To create your experiment, drag and drop datasets and modules here
Drag Items Here
Properties
Project
Experiment Properties
STATUS CODE
InDraft
Summary
Enter a few sentences describing your experiment (up to 140 characters).
Description
Enter the detailed description for your experiment.
Quick Help
NEW
RUN HISTORY
SAVE
SAVE AS
DISCARD CHANGES
RUN
SET UP WEB SERVICE
PUBLISH TO GALLERY

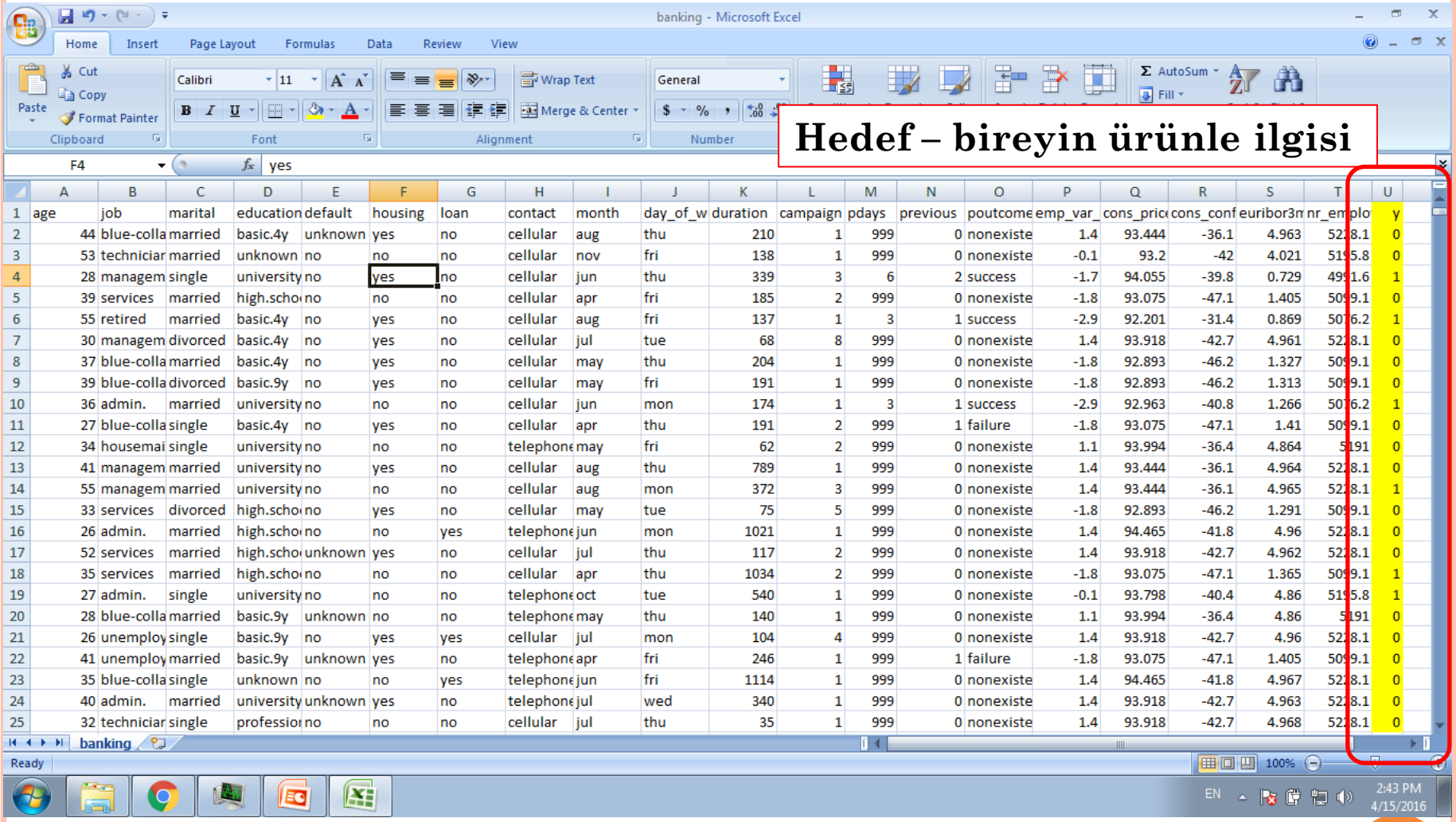
MS Azure ML

- Modelin oluşturulmasının ilk adımı, veri kaynağın eklenmesi
- Azure ML “Saved Datasets” menüsü altında birçok hazır örnek verileri sağlamaktadır
- Bunlar “Tutorial” veya “Sample” örneklerinde kullanılır


Experiments - Microsoft
https://studio.azureml.net/Home/ViewWorkspaceCached/31208adf9ea3456e9cfb14024cbf80ae#Workspaces/Experiments/Experiment/Draft/ViewExperiment
Microsoft Azure Machine Learning Studio
time remaining: 07:31
Guest
SIGN UP
Experiment created on 5/13/2016
In draft
Search experiment items
Saved Datasets
Samples
Adult Census Income ...
Airport Codes Dataset
Automobile price dat...
Bike Rental UCI datas...
Bill Gates RGB Image
Blood donation data
Book Reviews from A...
Breast cancer data
Breast Cancer Features
Breast Cancer Info
CRM Appetency Labe...
CRM Churn Labels Sh...
CRM Dataset Shared
To create your experiment, drag and drop datasets and modules here
Drag Items Here
Properties
Forum
Experiment Properties
STATUS CODE
InDraft
Summary
Enter a few sentences describing your experiment (up to 140 characters).
Description
Enter the detailed description for your experiment.
Quick Help
NEW

MS Azure ML

- Biz bu dersin sırasında Amazon ML'de kullanılan hedeflenmiş reklam veri seti kullanacağız
- Bu şekilde sizin herhangi başka veri setleriniz benzer şekilde Azure ML ile kullanılabilir
- Söz konusu veri "banking.csv" adında CSV dosyası formatında bir veri tabanıdır
- İlgili CSV dosyanın formatı ve oluşturulması son derste tartıştırıldı



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
1	age	job	marital	education	default	housing	loan	contact	month	day_of_w	duration	campaign	pdays	previous	poutcome	emp_var_	cons_pric	cons_conf	euribor3m	nr_emplo	y
2	44	blue-colla	married	basic.4y	unknown	yes	no	cellular	aug	thu	210	1	999	0	nonexiste	1.4	93.444	-36.1	4.963	5228.1	0
3	53	technician	married	unknown	no	no	no	cellular	nov	fri	138	1	999	0	nonexiste	-0.1	93.2	-42	4.021	5195.8	0
4	28	managem	single	university	no	yes	no	cellular	jun	thu	339	3	6	2	success	-1.7	94.055	-39.8	0.729	4991.6	1
5	39	services	married	high.scho	no	no	no	cellular	apr	fri	185	2	999	0	nonexiste	-1.8	93.075	-47.1	1.405	5099.1	0
6	55	retired	married	basic.4y	no	yes	no	cellular	aug	fri	137	1	3	1	success	-2.9	92.201	-31.4	0.869	5076.2	1
7	30	managem	divorced	basic.4y	no	yes	no	cellular	jul	tue	68	8	999	0	nonexiste	1.4	93.918	-42.7	4.961	5228.1	0
8	37	blue-colla	married	basic.4y	no	yes	no	cellular	may	thu	204	1	999	0	nonexiste	-1.8	92.893	-46.2	1.327	5099.1	0
9	39	blue-colla	divorced	basic.9y	no	yes	no	cellular	may	fri	191	1	999	0	nonexiste	-1.8	92.893	-46.2	1.313	5099.1	0
10	36	admin.	married	university	no	no	no	cellular	jun	mon	174	1	3	1	success	-2.9	92.963	-40.8	1.266	5076.2	1
11	27	blue-colla	single	basic.4y	no	yes	no	cellular	apr	thu	191	2	999	1	failure	-1.8	93.075	-47.1	1.41	5099.1	0
12	34	housemai	single	university	no	no	no	telephone	may	fri	62	2	999	0	nonexiste	1.1	93.994	-36.4	4.864	5191	0
13	41	managem	married	university	no	yes	no	cellular	aug	thu	789	1	999	0	nonexiste	1.4	93.444	-36.1	4.964	5228.1	0
14	55	managem	married	university	no	no	no	cellular	aug	mon	372	3	999	0	nonexiste	1.4	93.444	-36.1	4.965	5228.1	1
15	33	services	divorced	high.scho	no	yes	no	cellular	may	tue	75	5	999	0	nonexiste	-1.8	92.893	-46.2	1.291	5099.1	0
16	26	admin.	married	high.scho	no	no	yes	telephone	jun	mon	1021	1	999	0	nonexiste	1.4	94.465	-41.8	4.96	5228.1	0
17	52	services	married	high.scho	unknown	yes	no	cellular	jul	thu	117	2	999	0	nonexiste	1.4	93.918	-42.7	4.962	5228.1	0
18	35	services	married	high.scho	no	no	no	cellular	apr	thu	1034	2	999	0	nonexiste	-1.8	93.075	-47.1	1.365	5099.1	1
19	27	admin.	single	university	no	no	no	telephone	oct	tue	540	1	999	0	nonexiste	-0.1	93.798	-40.4	4.86	5195.8	1
20	28	blue-colla	married	basic.9y	unknown	no	no	telephone	may	thu	140	1	999	0	nonexiste	1.1	93.994	-36.4	4.86	5191	0
21	26	unemploy	single	basic.9y	no	yes	yes	cellular	jul	mon	104	4	999	0	nonexiste	1.4	93.918	-42.7	4.96	5228.1	0
22	41	unemploy	married	basic.9y	unknown	yes	no	telephone	apr	fri	246	1	999	1	failure	-1.8	93.075	-47.1	1.405	5099.1	0
23	35	blue-colla	single	unknown	no	no	yes	telephone	jun	fri	1114	1	999	0	nonexiste	1.4	94.465	-41.8	4.967	5228.1	0
24	40	admin.	married	university	unknown	yes	no	telephone	jul	wed	340	1	999	0	nonexiste	1.4	93.918	-42.7	4.963	5228.1	0
25	32	technician	single	professio	no	no	no	cellular	jul	thu	35	1	999	0	nonexiste	1.4	93.918	-42.7	4.968	5228.1	0

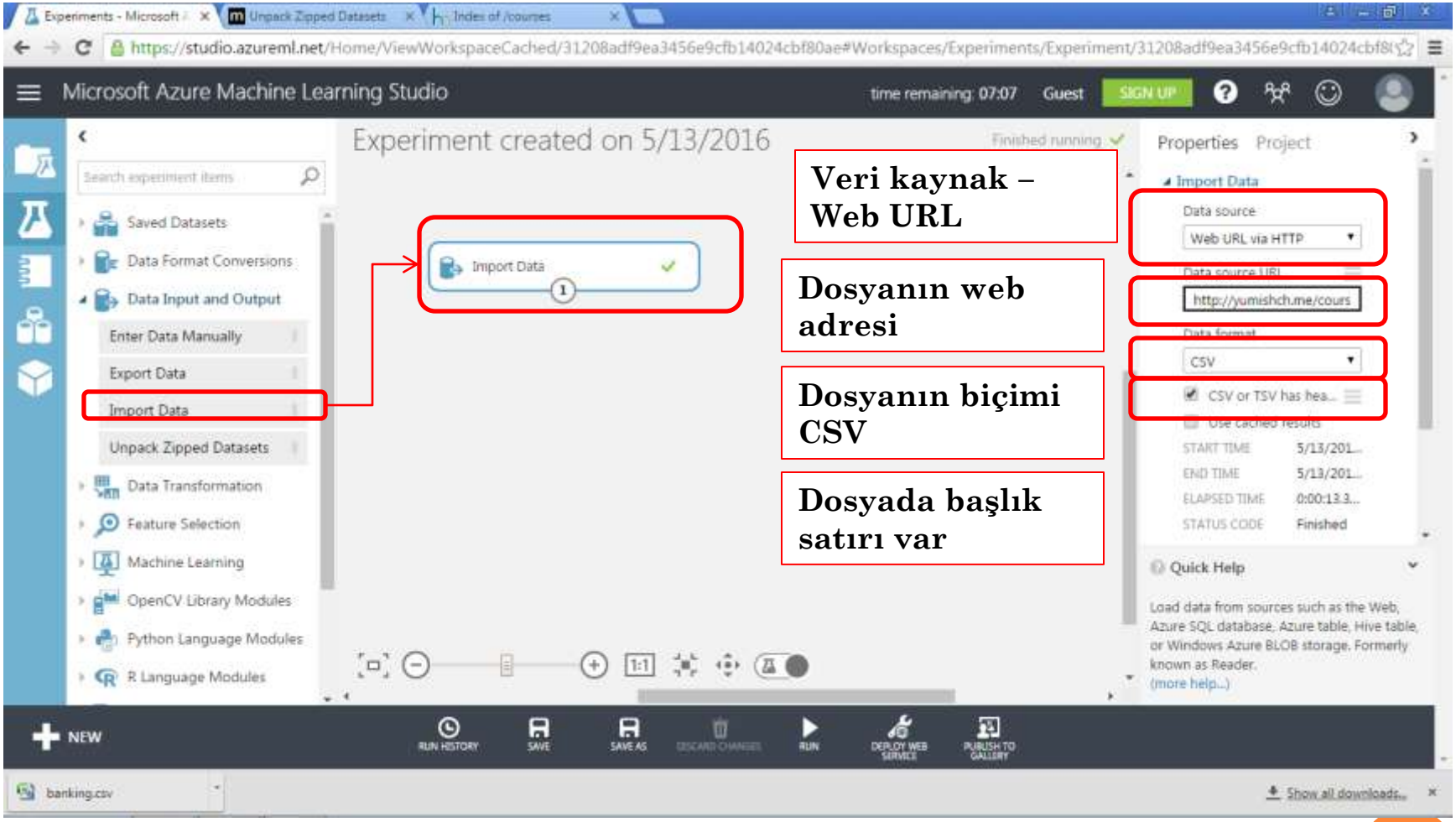
MS Azure ML

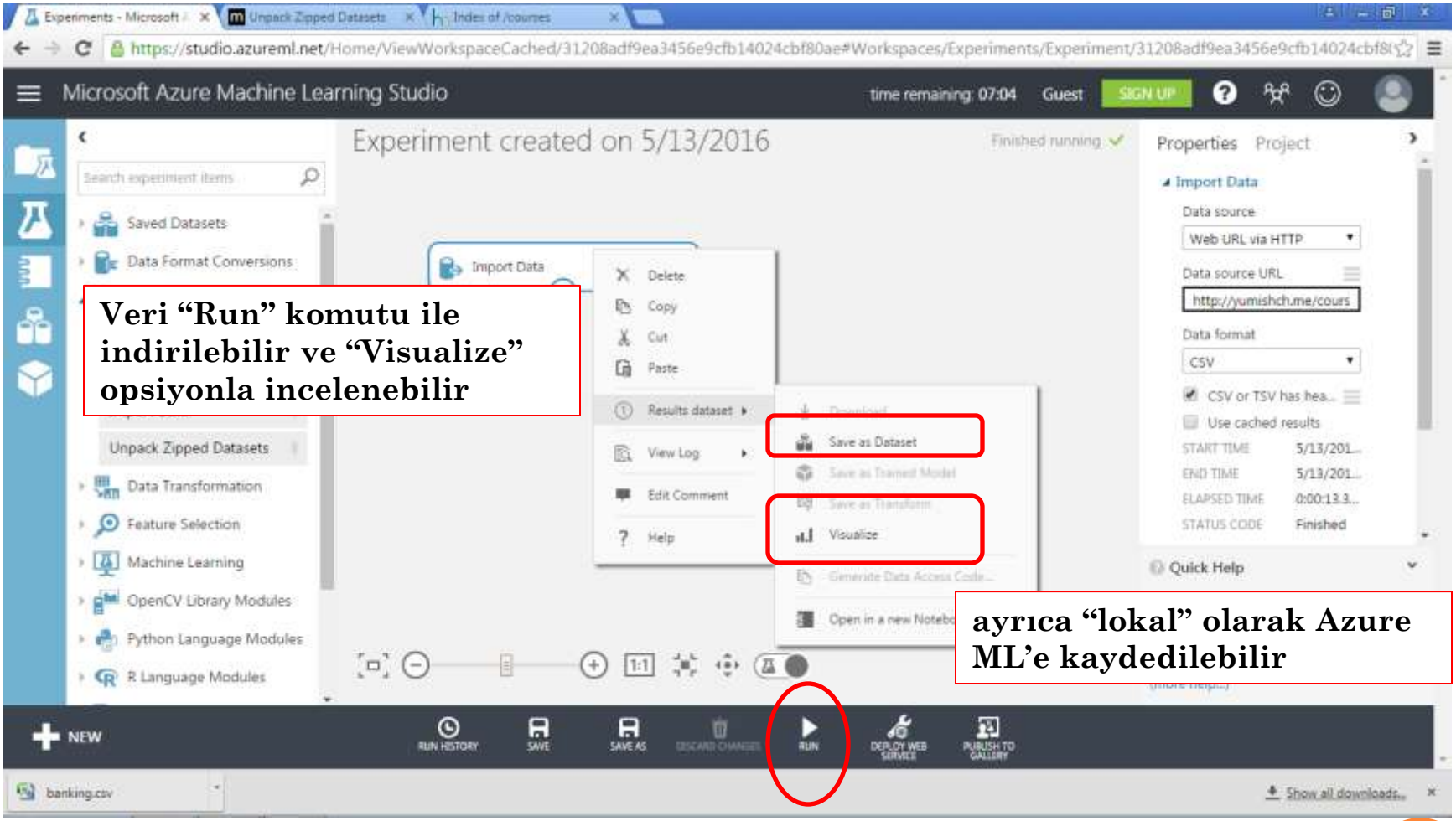
- Azure ML dışardan veri girişi için 3 olanak sağlar
  - Enter Data Manually – elle veri girişi, tabi bunu kullanmak istemiyoruz
  - Import Data – veri İnternet üzerindeki bir kaynaktan indir; geçerli kaynakları herhangi bir Web adresi veya kullanıcının Azure veritabanı veya Azure deposu hizmeti
  - Unpack Zipped Datasets – zip olarak arşivlenmiş veri kullanıcının bilgisayarından indir


Microsoft Azure Machine Learning Studio
time remaining: 07:14
Guest
SIGN UP
Experiment created on 5/13/2016
In draft
Draft saved at 11:06:00 AM
Saved Datasets
Data Format Conversions
Data Input and Output
Enter Data Manually
Export Data
Import Data
Unpack Zipped Datasets
Data Transformation
Feature Selection
Machine Learning
OpenCV Library Modules
Python Language Modules
R Language Modules
Statistical Functions
Properties
Project
Web Service Parameters
Dataset to Unpack
Experiment Properties
STATUS CODE
InDraft
Summary
Description
Quick Help
Unpacks datasets from a zip package in user storage.
(more help...)

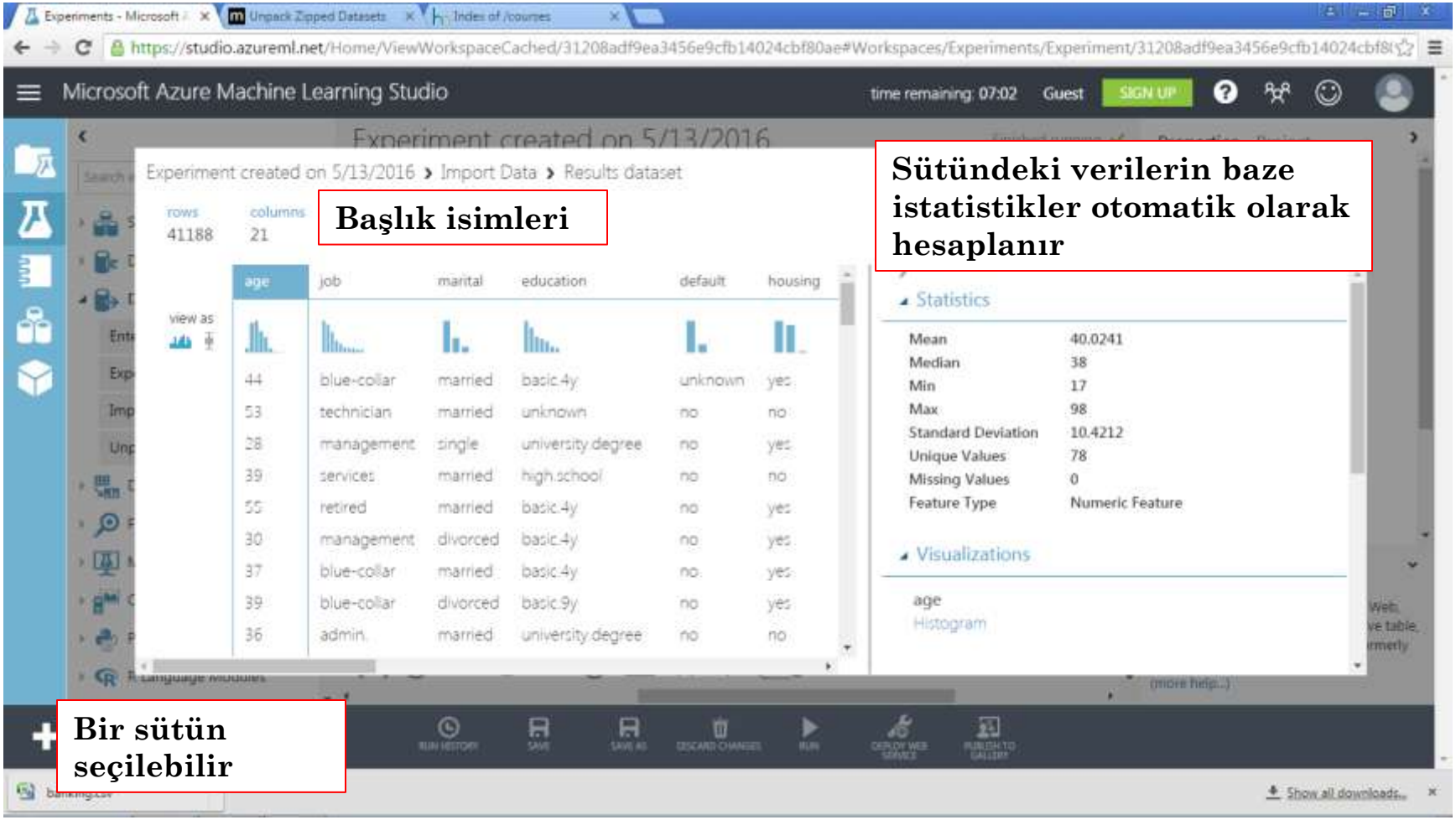
MS Azure ML

- Eğer sizde Azure hesabınız yoksa, Azure depo hizmetleri veya lokal dosya indirme opsiyonları yoktur
- Biz verilerimizi Azure ML'e göndermek için CSV dosyamızı bir İnternet serverine yükleyip "Import Data" seçeneği kullanacağız
- Dosyamızın İnternet konumu - http://yumishch.me/courses/banking.csv

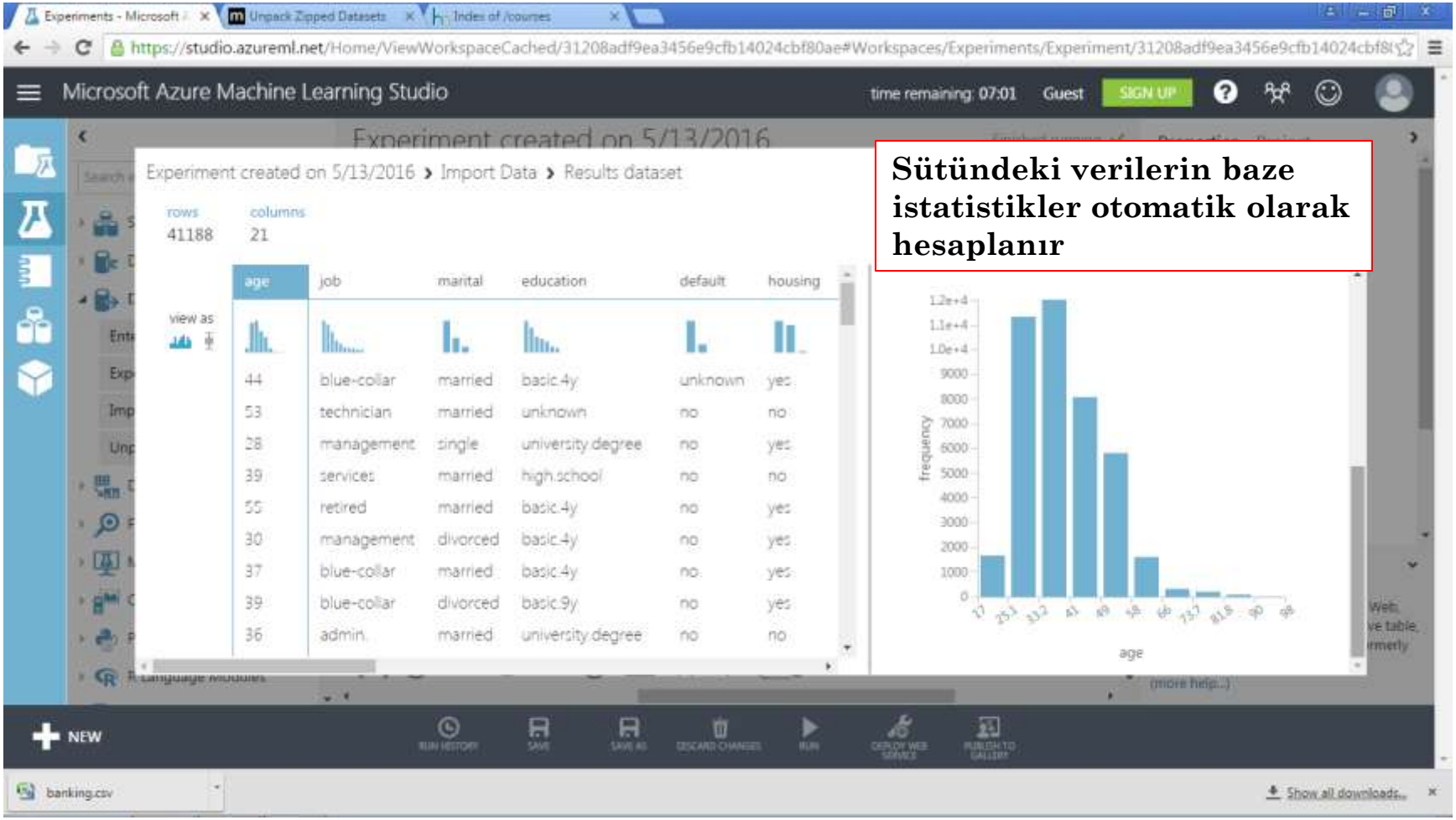

Microsoft Azure Machine Learning Studio
Experiment created on 5/13/2016
Import Data
Properties
Project
Data source
Web URL via HTTP
http://yumishch.me/cours
CSV
CSV or TSV has hea...
Quick Help
Load data from sources such as the Web, Azure SQL database, Azure table, Hive table, or Windows Azure BLOB storage. Formerly known as Reader.
(more help...)
Veri kaynak – Web URL
Dosyanın web adresi
Dosyanın biçimi CSV
Dosyada başlık satırı var


Microsoft Azure Machine Learning Studio
Experiment created on 5/13/2016
Veri "Run" komutu ile indirilebilir ve "Visualize" opsiyonla incelenebilir
ayrıca "lokal" olarak Azure ML'e kaydedilebilir
NEW
RUN

Dikkat etmeniz gereken noktalar:

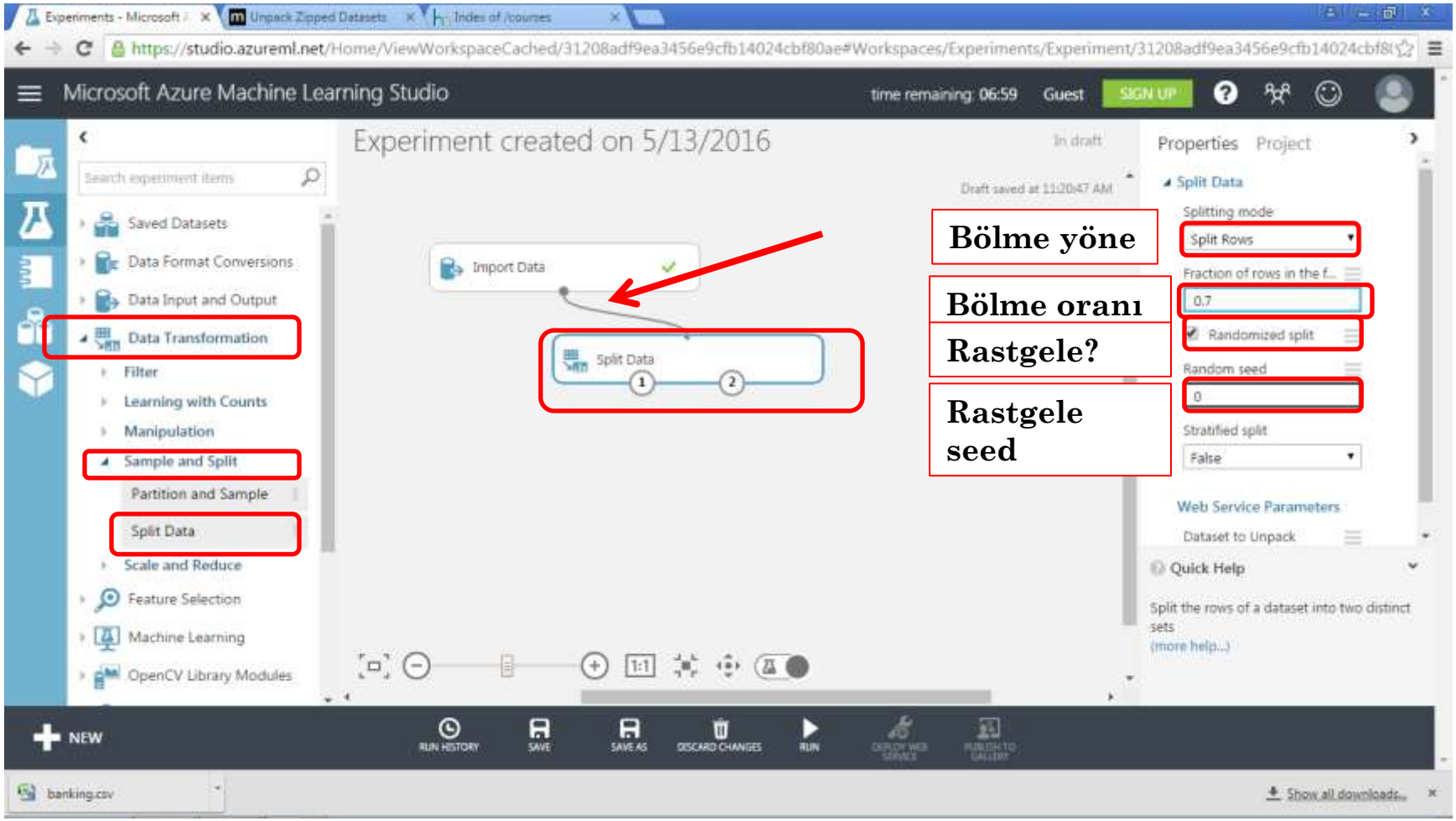


Dikkat etmeniz gereken noktalar:



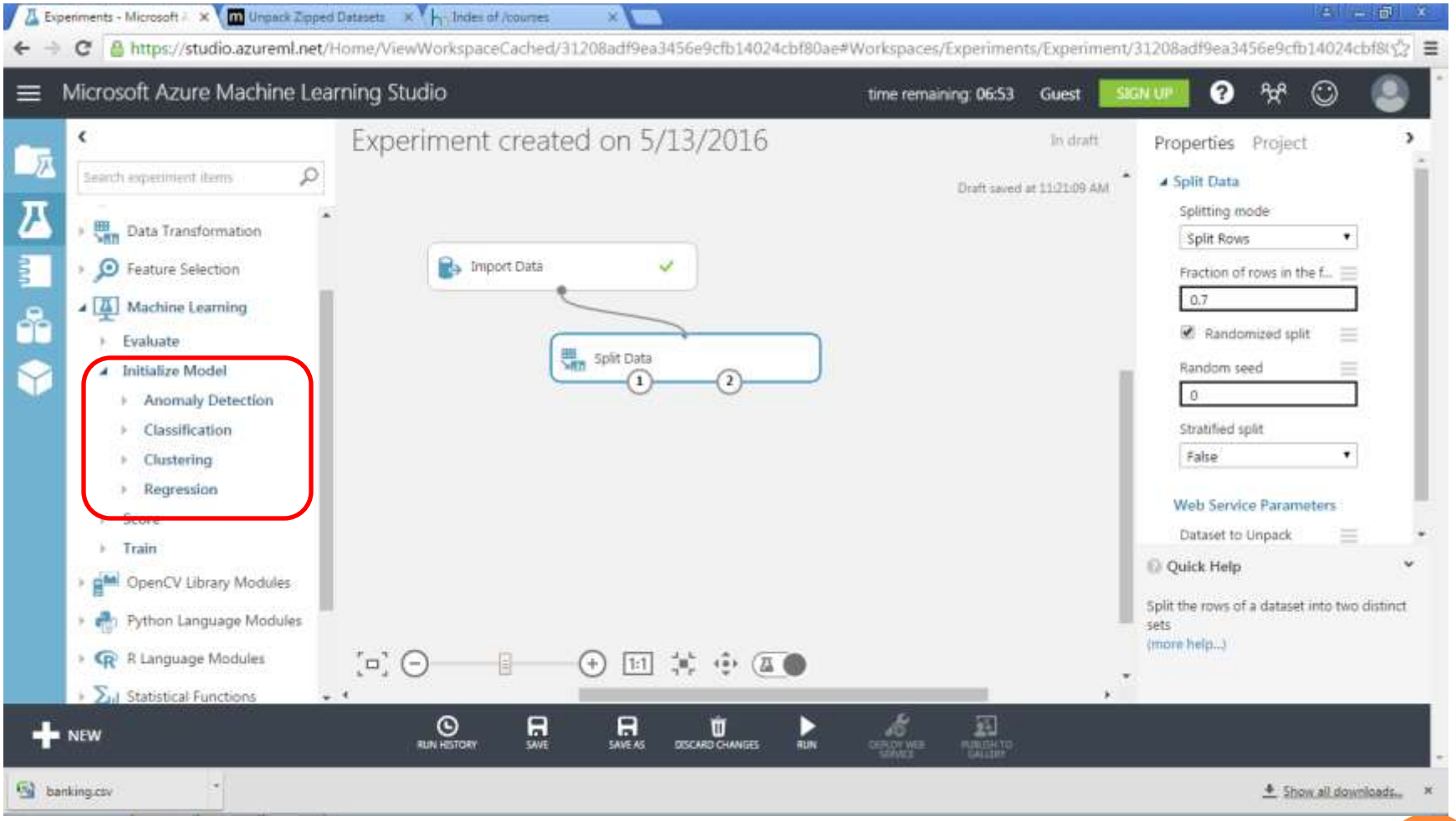
MS Azure ML

- Veri kaynağı oluşturduktan sonra veriler eğitim ve doğrulama (performans değerlendirilmesi) için kullanılacak kümelerine bölünmeli
- Bunun için “Data Transform>Sample and Split” menüsü altında “Split Data” (veri böl) kutu seçiliyor ve veri kaynağına, fareyi veri kaynağının altındaki noktadan “split data” kutusuna çekilerek bağlanıyor


Microsoft Azure Machine Learning Studio
Experiment created on 5/13/2016
Import Data
Split Data
Bölme yöne
Bölme oranı
Rastgele?
Rastgele seed
Split Rows
0.7
0
False
Data Transformation
Sample and Split
Partition and Sample
Split Data
Scale and Reduce
Split the rows of a dataset into two distinct sets

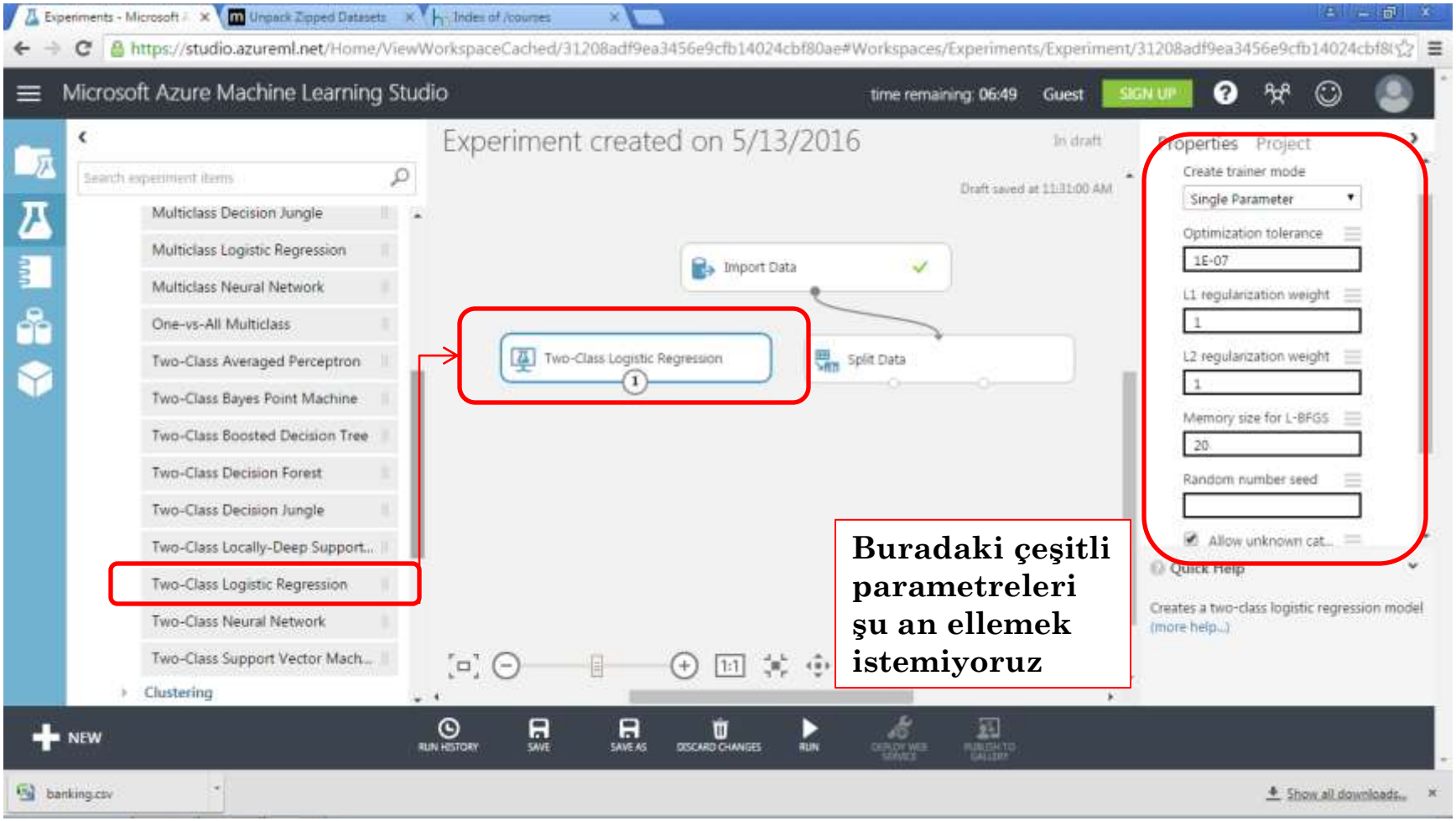
MS Azure ML

- ML modeli “Machine Learning“ menüsünden eklenir
- Azure ML birçok ML model tipi sağlamaktadır, bunlar şu kategoriler altına gruplandırılmış;
  - Anomaly Detection – anomali tespiti
  - Classification – sınıflandırma
  - Clustering – kümeleme
  - Regression – regresyon
- Ayrıca her bir grubunda birçok farklı ML yöntem sunulmaktadır


Microsoft Azure Machine Learning Studio
time remaining: 06:53
Guest
SIGN UP
Experiment created on 5/13/2016
In draft
Draft saved at 11:21:09 AM
Search experiment items
Data Transformation
Feature Selection
Machine Learning
Evaluate
Initialize Model
Anomaly Detection
Classification
Clustering
Regression
Train
OpenCV Library Modules
Python Language Modules
R Language Modules
Statistical Functions
Import Data
Split Data
Properties
Project
Split Data
Splitting mode
Split Rows
Fraction of rows in the f...
0.7
Randomized split
Random seed
0
Stratified split
False
Web Service Parameters
Dataset to Unpack
Quick Help
Split the rows of a dataset into two distinct sets
(more help...)
NEW
RUN HISTORY
SAVE
SAVE AS
DISCARD CHANGES
RUN
banking.csv
Show all downloads...

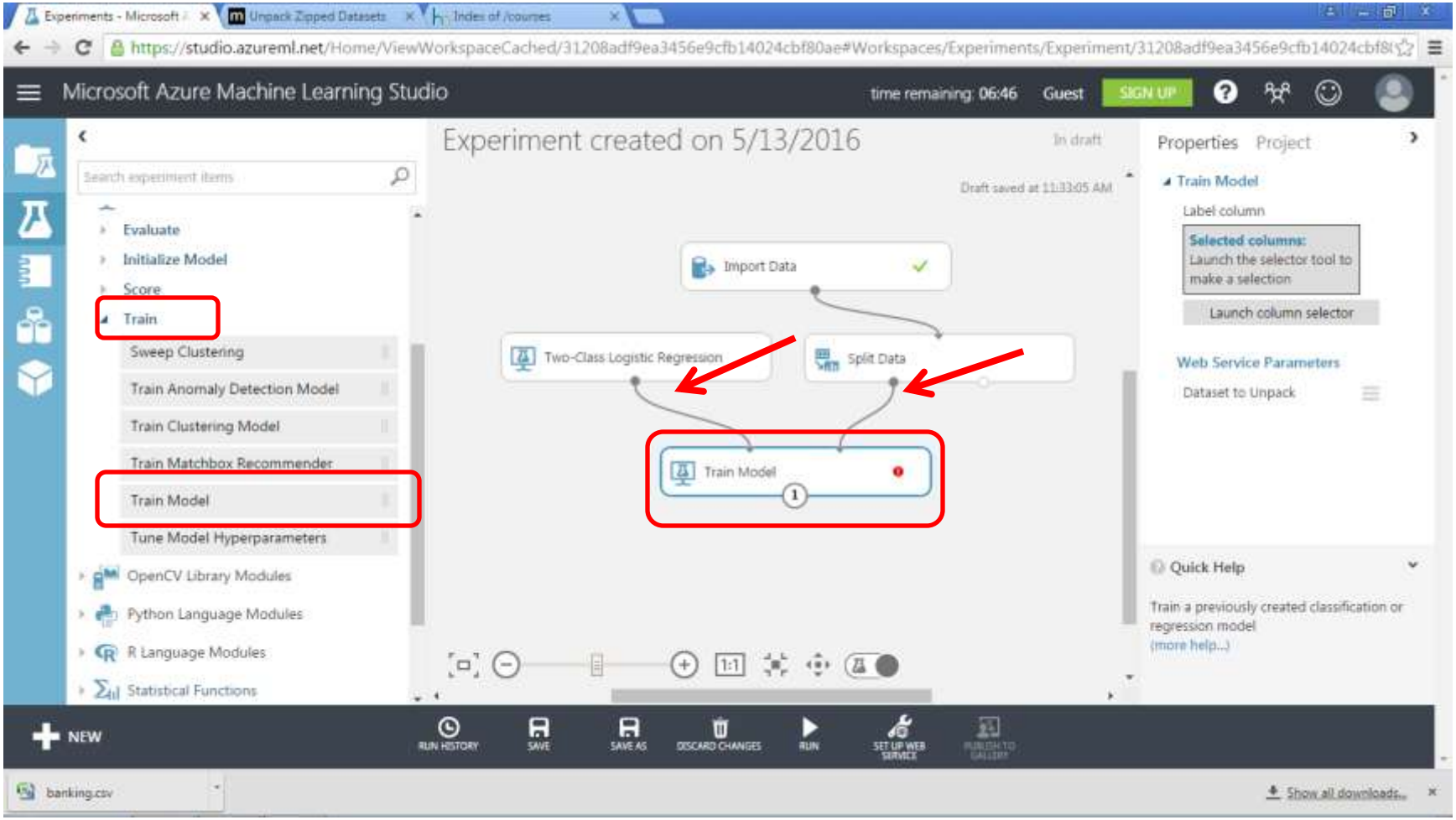
MS Azure ML

- Durumumuzda, sınıflandırma grubundan 2 sınıflı lojistik regresyon (2-class logistic regression) kullanılacaktır


Microsoft Azure Machine Learning Studio
time remaining: 06:49
Guest
SIGN UP
Experiment created on 5/13/2016
In draft
Draft saved at 11:31:00 AM
Multiclass Decision Jungle
Multiclass Logistic Regression
Multiclass Neural Network
One-vs-All Multiclass
Two-Class Averaged Perceptron
Two-Class Bayes Point Machine
Two-Class Boosted Decision Tree
Two-Class Decision Forest
Two-Class Decision Jungle
Two-Class Locally-Deep Support...
Two-Class Logistic Regression
Two-Class Neural Network
Two-Class Support Vector Mach...
Clustering
Import Data
Two-Class Logistic Regression
Split Data
Properties
Project
Create trainer mode
Single Parameter
Optimization tolerance
1E-07
L1 regularization weight
1
L2 regularization weight
1
Memory size for L-BFGS
20
Random number seed
Allow unknown cat...
Quick Help
Creates a two-class logistic regression model
(more help...)
Buradaki çeşitli parametreleri şu an ellemek istemiyoruz
NEW
RUN HISTORY
SAVE
SAVE AS
DISCARD CHANGES
RUN
banking.csv
Show all downloads...

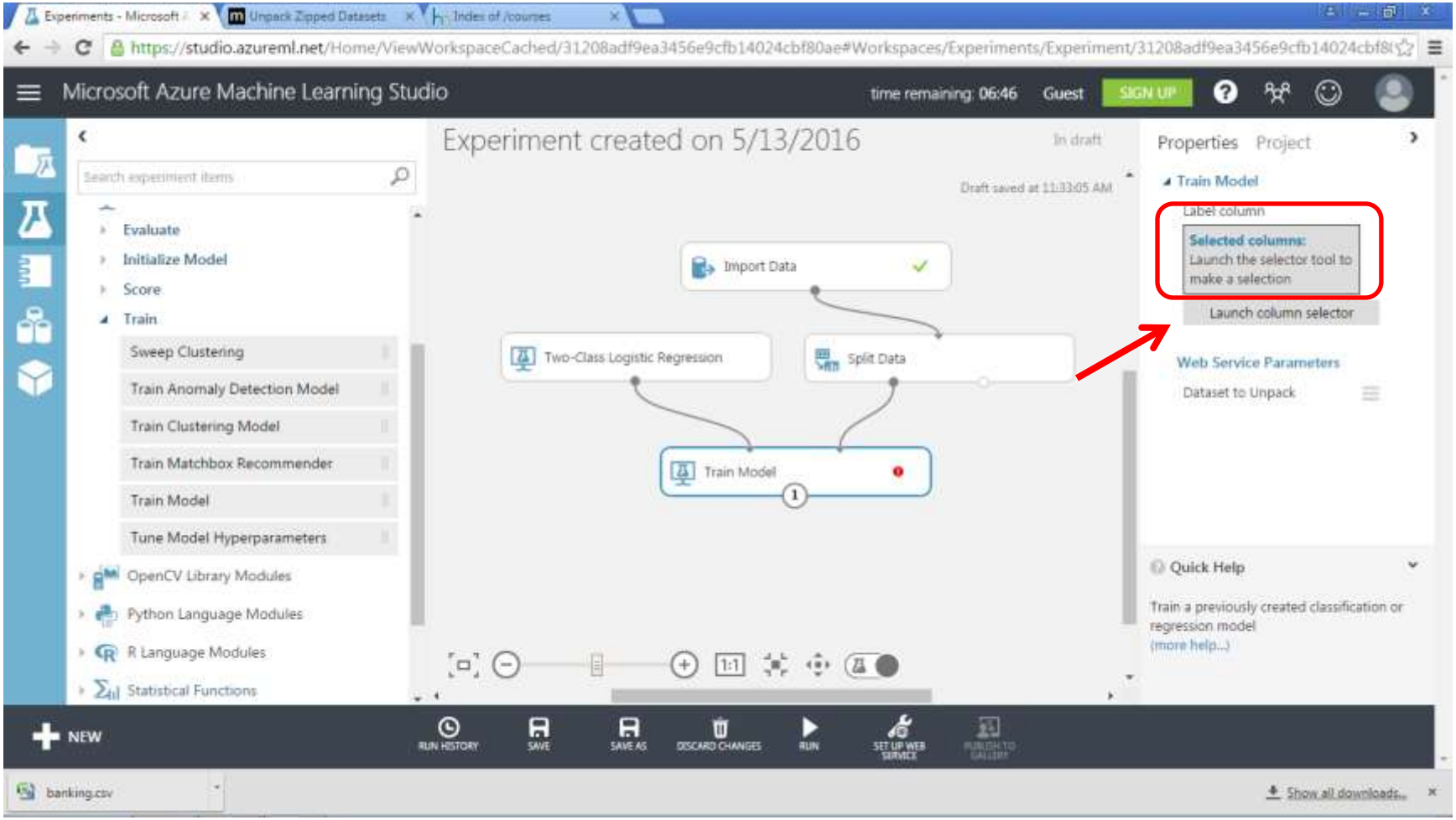
MS Azure ML

- Eklediğimiz modelin eğitim işlemi eklemek için, “Machine Learning >Train” menüsünden “Train model” (modeli eğit) kutusu ekliyoruz ve üstteki sağ giriş noktası önce eklediğimiz ML model kutusuna, sol giriş noktası ise “Split” kutusunun bir çıkışına bağlıyoruz

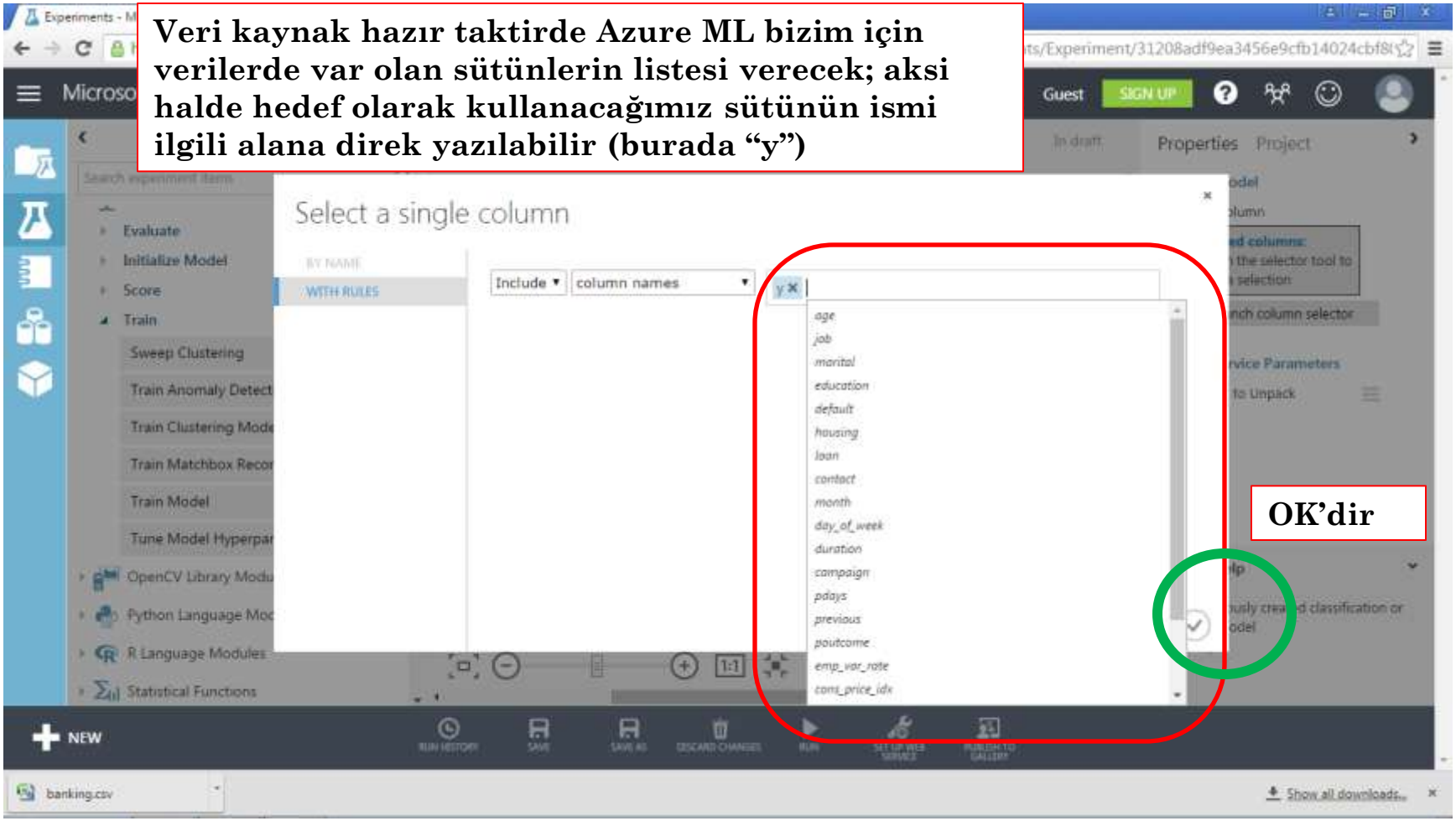

Microsoft Azure Machine Learning Studio
time remaining: 06:46
Guest
SIGN UP
Experiment created on 5/13/2016
In draft
Draft saved at 11:33:05 AM
Evaluate
Initialize Model
Score
Train
Sweep Clustering
Train Anomaly Detection Model
Train Clustering Model
Train Matchbox Recommender
Train Model
Tune Model Hyperparameters
OpenCV Library Modules
Python Language Modules
R Language Modules
Statistical Functions
Import Data
Two-Class Logistic Regression
Split Data
Train Model
Properties
Project
Train Model
Label column
Selected columns:
Launch the selector tool to make a selection
Launch column selector
Web Service Parameters
Dataset to Unpack
Quick Help
Train a previously created classification or regression model
(more help...)
NEW
RUN HISTORY
SAVE
SAVE AS
DISCARD CHANGES
RUN
SET UP WEB SERVICE
banking.csv
Show all downloads...

MS Azure ML

- İkinci adım olarak, eğitimin hedefi olarak kullanılacak veri tablomuzun sütünü seçmemiz gerekir
- Bunun için “Launch column selector” düğmeye basarak “sütün seçme” ekranına geçiyoruz

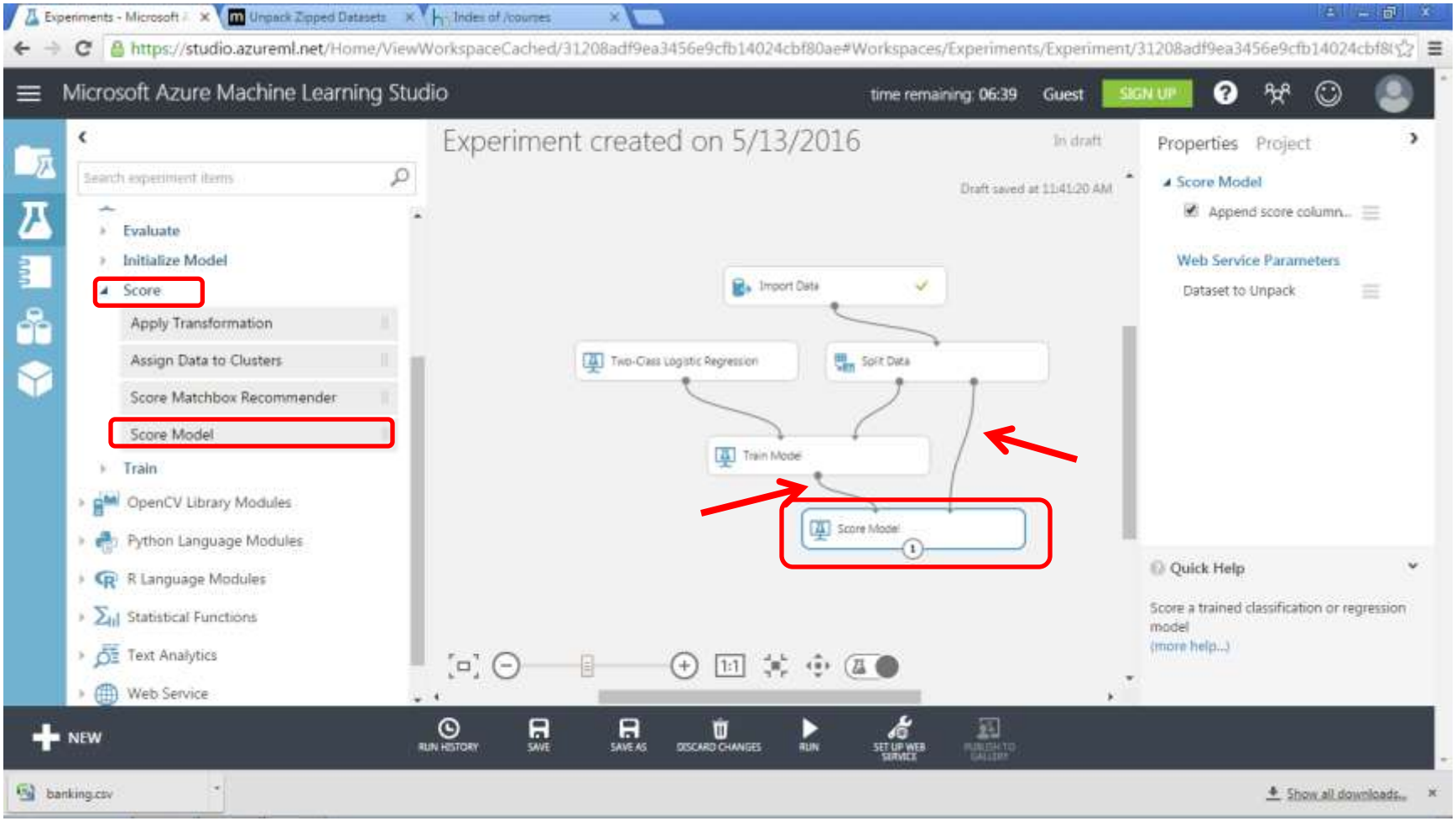

Microsoft Azure Machine Learning Studio
time remaining: 06:46
Guest
SIGN UP
Experiment created on 5/13/2016
In draft
Draft saved at 11:33:05 AM
Search experiment items
Evaluate
Initialize Model
Score
Train
Sweep Clustering
Train Anomaly Detection Model
Train Clustering Model
Train Matchbox Recommender
Train Model
Tune Model Hyperparameters
OpenCV Library Modules
Python Language Modules
R Language Modules
Statistical Functions
Import Data
Two-Class Logistic Regression
Split Data
Train Model
Properties
Project
Train Model
Label column
Selected columns:
Launch the selector tool to make a selection
Launch column selector
Web Service Parameters
Dataset to Unpack
Quick Help
Train a previously created classification or regression model
(more help...)
NEW
RUN HISTORY
SAVE
SAVE AS
DISCARD CHANGES
RUN
SET UP WEB SERVICE
banking.csv
Show all downloads...

Veri kaynak hazır taktirde Azure ML bizim için verilerde var olan sütünlerin listesi verecek; aksi halde hedef olarak kullanacağımız sütünün ismi ilgili alana direk yazılabilir (burada "y")



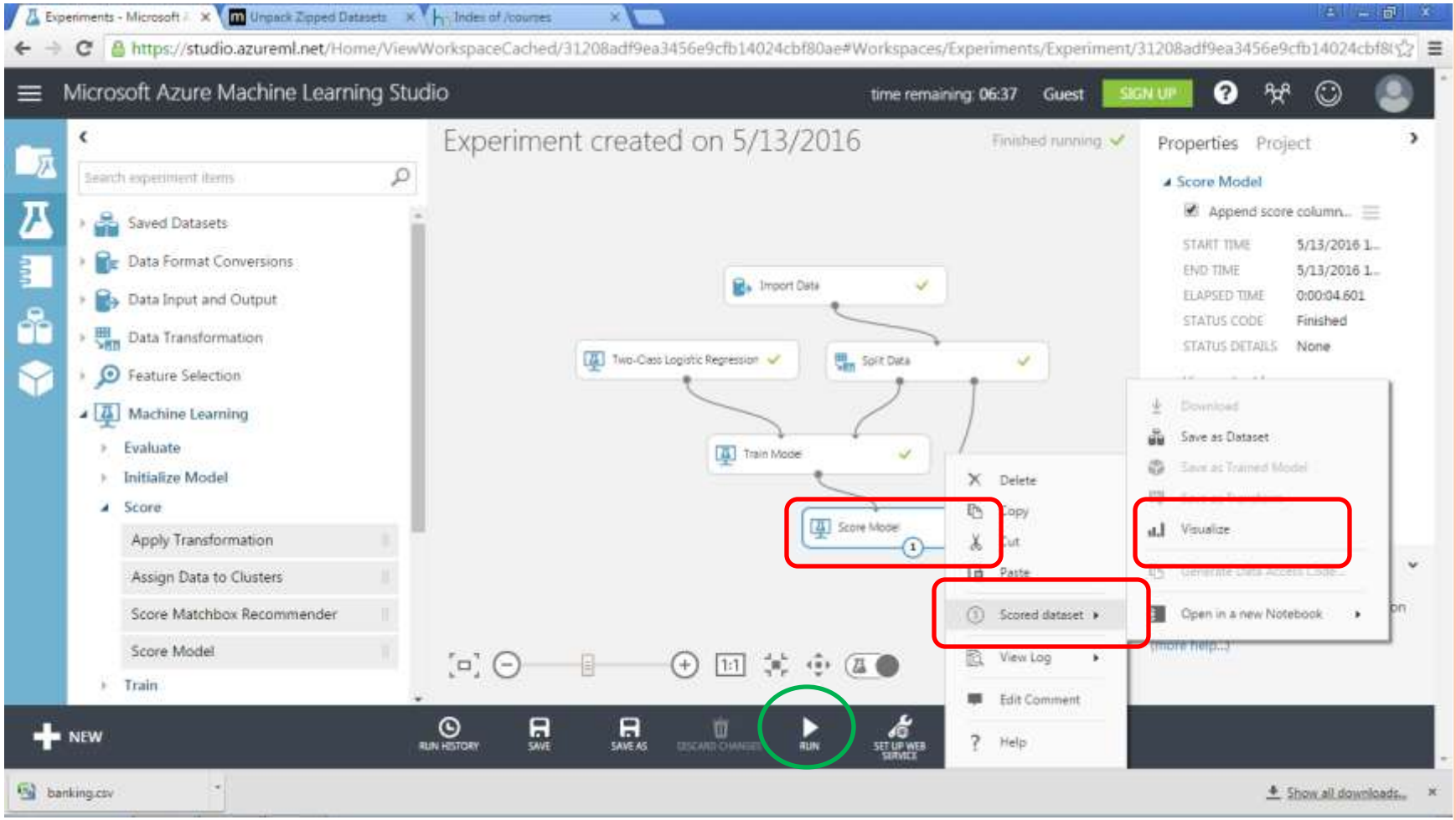
MS Azure ML

- Modeli eğittikten sonra elde edilen modeli doğrulama veri kümesine uygulamak için, “Machine Learning>Score” menüsünden “Score Model” kutusu diagrama eklenir ve eğitilmiş modele ve “Split” kutusunun 2. çıkışına bağlanır

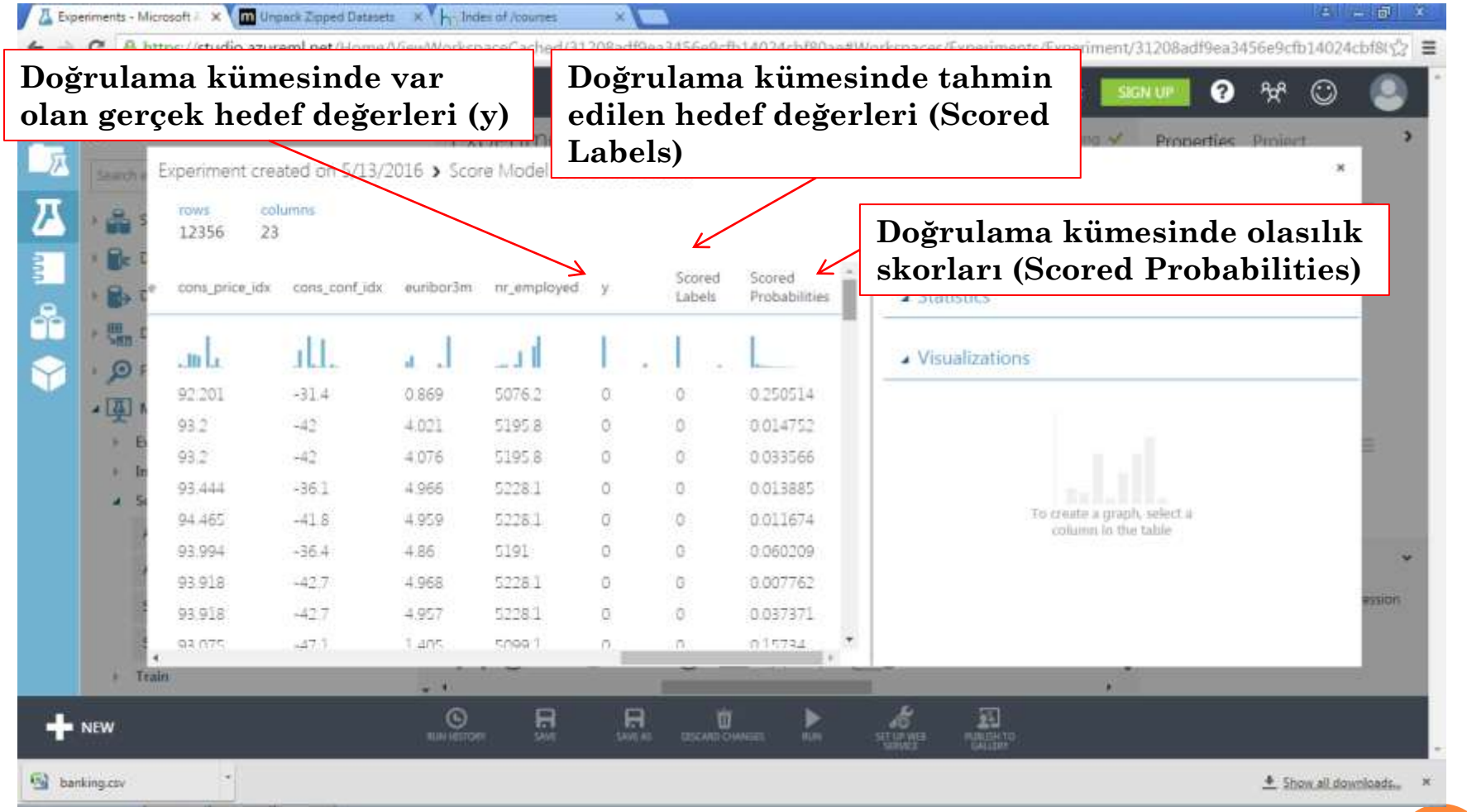

Microsoft Azure Machine Learning Studio
time remaining: 06:39
Guest
SIGN UP
Experiment created on 5/13/2016
In draft
Draft saved at 11:41:20 AM
Search experiment items
Evaluate
Initialize Model
Score
Apply Transformation
Assign Data to Clusters
Score Matchbox Recommender
Score Model
Train
OpenCV Library Modules
Python Language Modules
R Language Modules
Statistical Functions
Text Analytics
Web Service
Import Data
Two-Class Logistic Regression
Split Data
Train Model
Score Model
Properties
Project
Score Model
Append score column...
Web Service Parameters
Dataset to Unpack
Quick Help
Score a trained classification or regression model
(more help...)
NEW
RUN HISTORY
SAVE
SAVE AS
DISCARD CHANGES
RUN
SET UP WEB SERVICE
banking.csv
Show all downloads...

MS Azure ML

- Herhangi aşamada olan diagramatik modelimiz "Run" opsiyon ile işletmeye verilebilir ve farklı diagramın aşamasının durumları "Visualize" opsiyonla incelenebilir

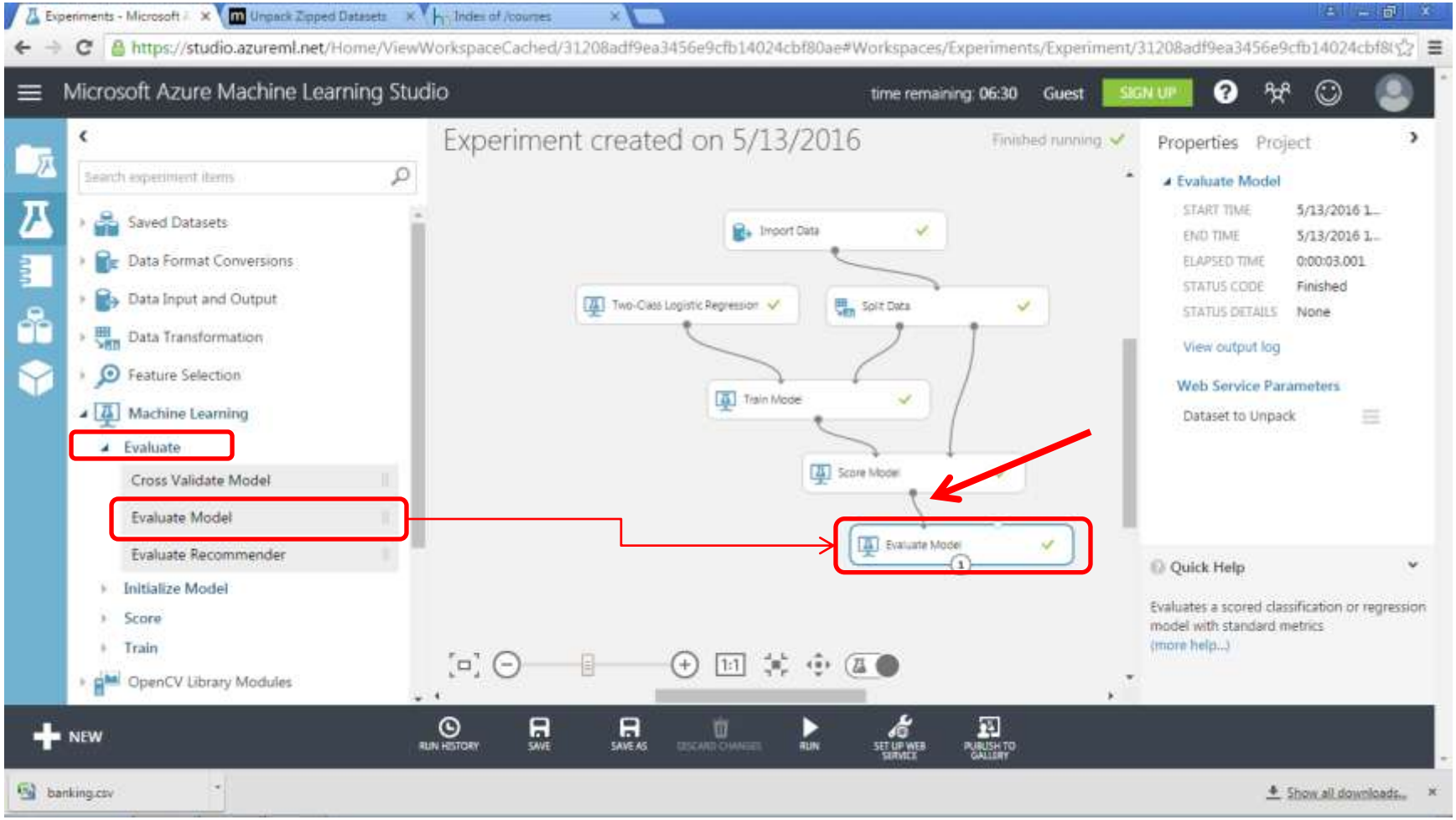

Microsoft Azure Machine Learning Studio
time remaining: 06:37
Guest
SIGN UP
Experiment created on 5/13/2016
Finished running
Properties
Project
Score Model
Append score column...
START TIME 5/13/2016 1...
END TIME 5/13/2016 1...
ELAPSED TIME 0:00:04.601
STATUS CODE Finished
STATUS DETAILS None
Search experiment items
Saved Datasets
Data Format Conversions
Data Input and Output
Data Transformation
Feature Selection
Machine Learning
Evaluate
Initialize Model
Score
Apply Transformation
Assign Data to Clusters
Score Matchbox Recommender
Score Model
Train
Import Data
Two-Class Logistic Regression
Split Data
Train Model
Score Model
Delete
Copy
Cut
Paste
Scored dataset
View Log
Edit Comment
Help
Download
Save as Dataset
Save as Trained Model
Visualize
Open in a new Notebook
NEW
RUN HISTORY
SAVE
SAVE AS
DISCARD CHANGES
RUN
SET UP WEB SERVICE
banking.csv
Show all downloads...

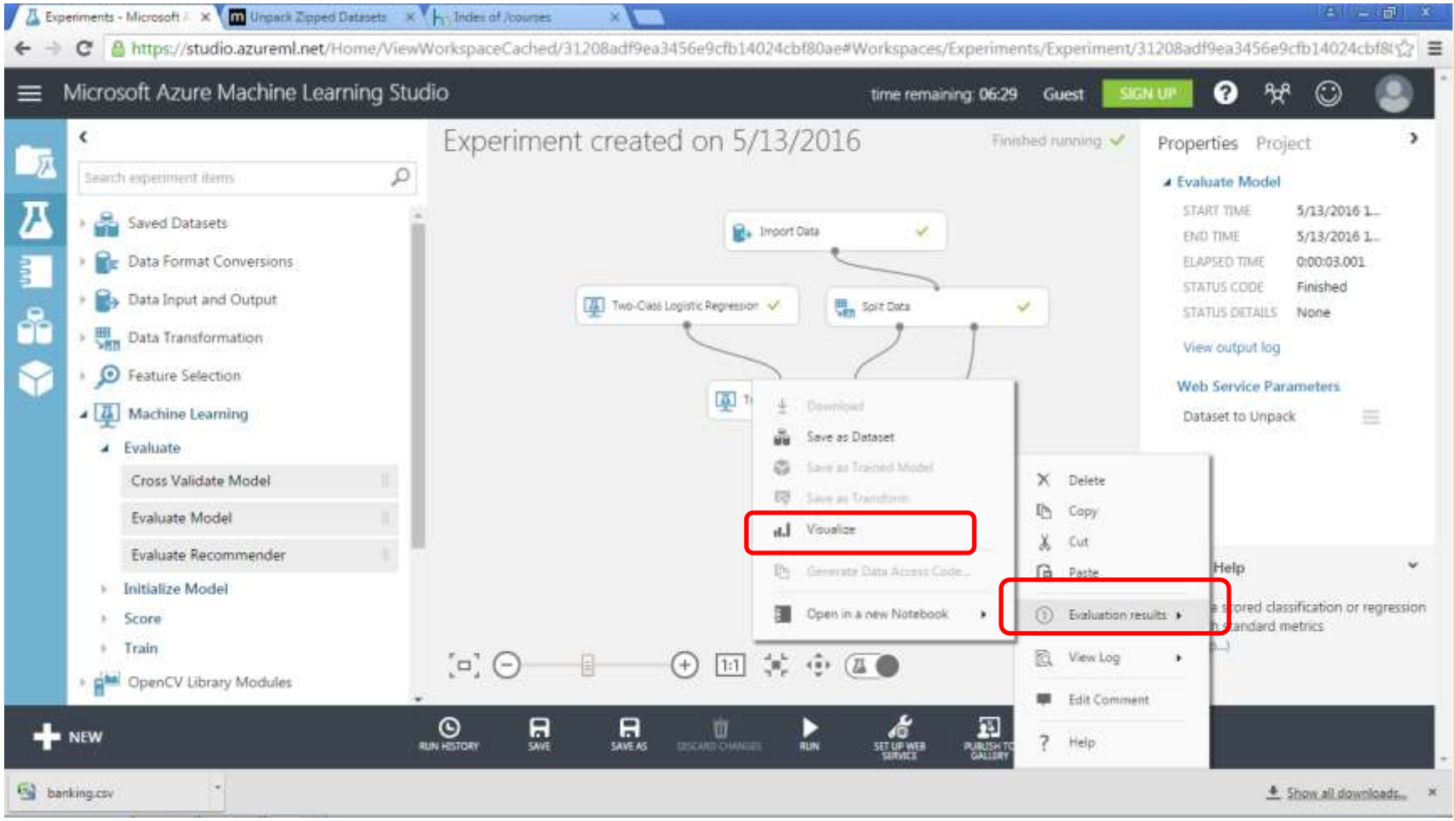
Doğrulama kümesinde sınıflandırma sonuçları



MS Azure ML

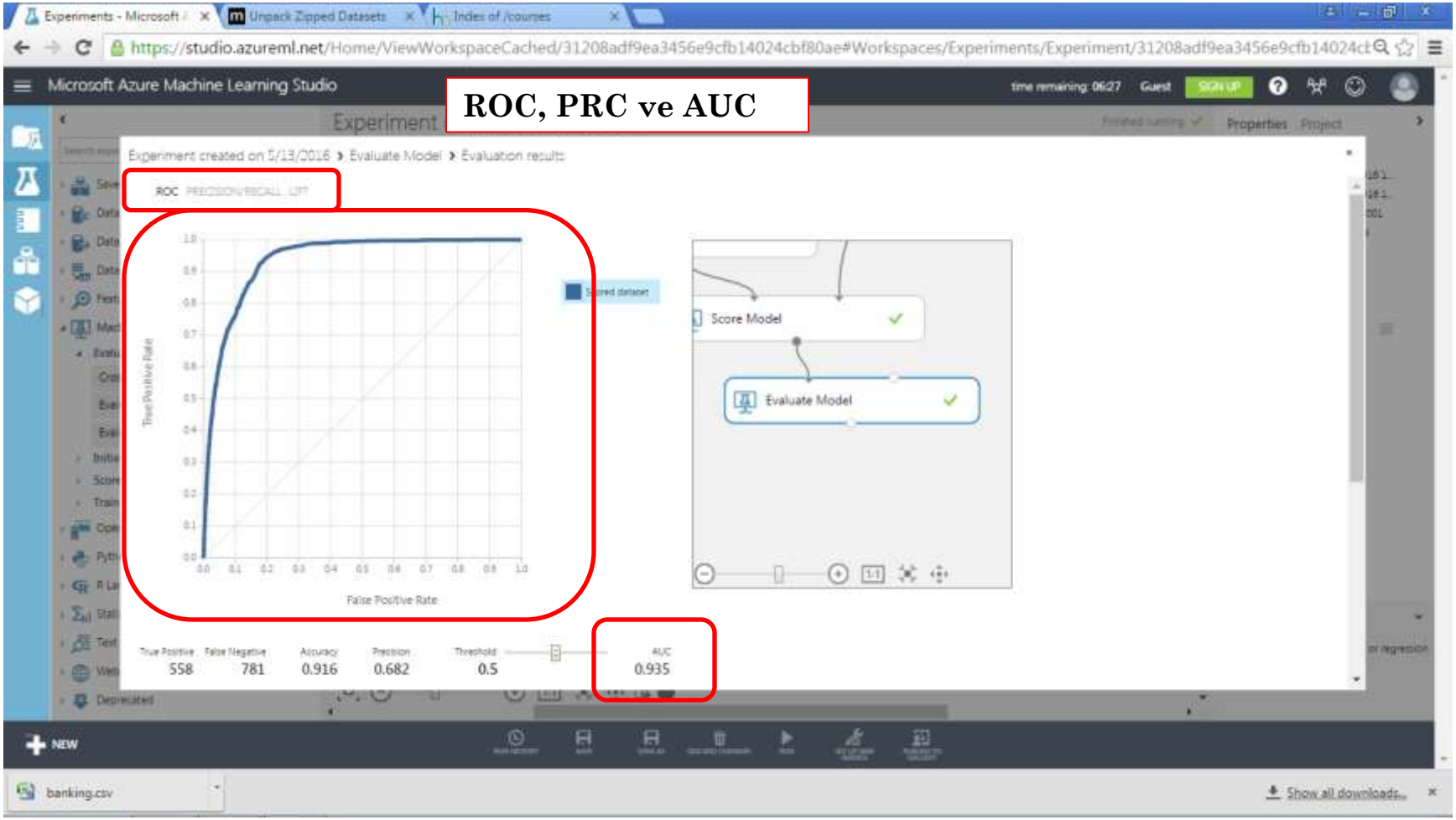
- Doğrulama veri kümesi için modelimizin performans ölçekleri oluşturmak için, “Machine Learning>Evaluate” menüsünden “Evaluate Model” (model değerlendir) kutusu diagramımıza eklenir ve “Score model” kutusuna bağlanır

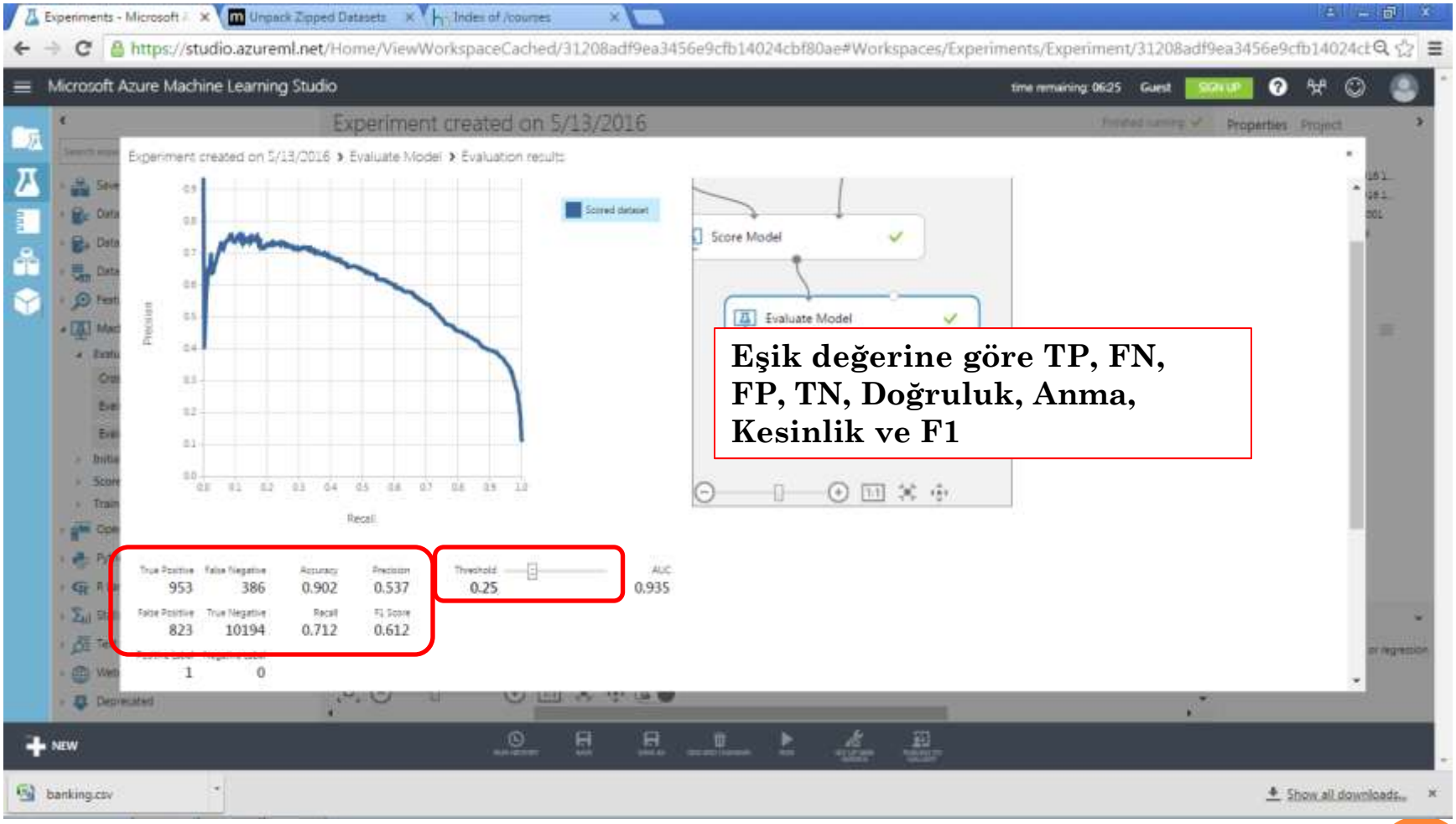

Microsoft Azure Machine Learning Studio
time remaining: 06:30
Guest
SIGN UP
Experiment created on 5/13/2016
Finished running
Properties
Project
Evaluate Model
START TIME 5/13/2016 1...
END TIME 5/13/2016 1...
ELAPSED TIME 0:00:03.001
STATUS CODE Finished
STATUS DETAILS None
View output log
Web Service Parameters
Dataset to Unpack
Saved Datasets
Data Format Conversions
Data Input and Output
Data Transformation
Feature Selection
Machine Learning
Evaluate
Cross Validate Model
Evaluate Model
Evaluate Recommender
Initialize Model
Score
Train
OpenCV Library Modules
Import Data
Two-Class Logistic Regression
Split Data
Train Model
Score Model
Evaluate Model
Quick Help
Evaluates a scored classification or regression model with standard metrics
(more help...)
NEW
RUN HISTORY
SAVE
SAVE AS
DISCARD CHANGES
RUN
SET UP WEB SERVICE
PUBLISH TO GALLERY
banking.csv
Show all downloads...

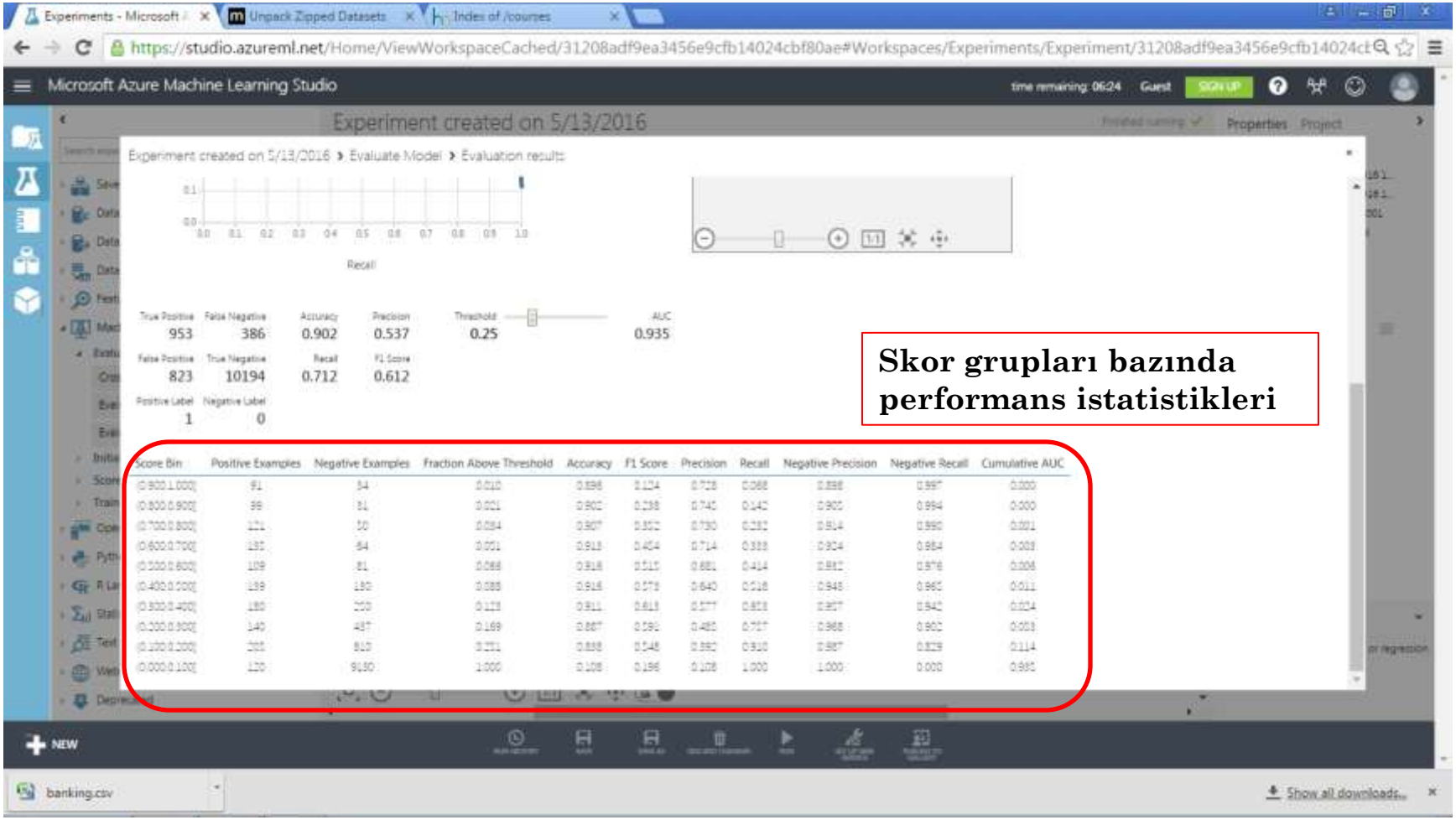

Microsoft Azure Machine Learning Studio
time remaining: 06:29
Guest
SIGN UP
Experiment created on 5/13/2016
Finished running
Properties
Project
Evaluate Model
START TIME 5/13/2016 1...
END TIME 5/13/2016 1...
ELAPSED TIME 0:00:03.001
STATUS CODE Finished
STATUS DETAILS None
View output log
Web Service Parameters
Dataset to Unpack
Saved Datasets
Data Format Conversions
Data Input and Output
Data Transformation
Feature Selection
Machine Learning
Evaluate
Cross Validate Model
Evaluate Model
Evaluate Recommender
Initialize Model
Score
Train
OpenCV Library Modules
Import Data
Two-Class Logistic Regression
Split Data
Download
Save as Dataset
Visualize
Generate Data Access Code...
Open in a new Notebook
Delete
Copy
Cut
Paste
Evaluation results
View Log
Edit Comment
Help
NEW
RUN HISTORY
SAVE
SAVE AS
DISCARD CHANGES
RUN
SET UP WEB SERVICE
PUBLISH TO GALLERY
banking.csv
Show all downloads...

MS Azure ML

- Bu şekilde oluşturulan performans değerlendirme raporunda tanıdığımız birçok ölçek verilmektedir

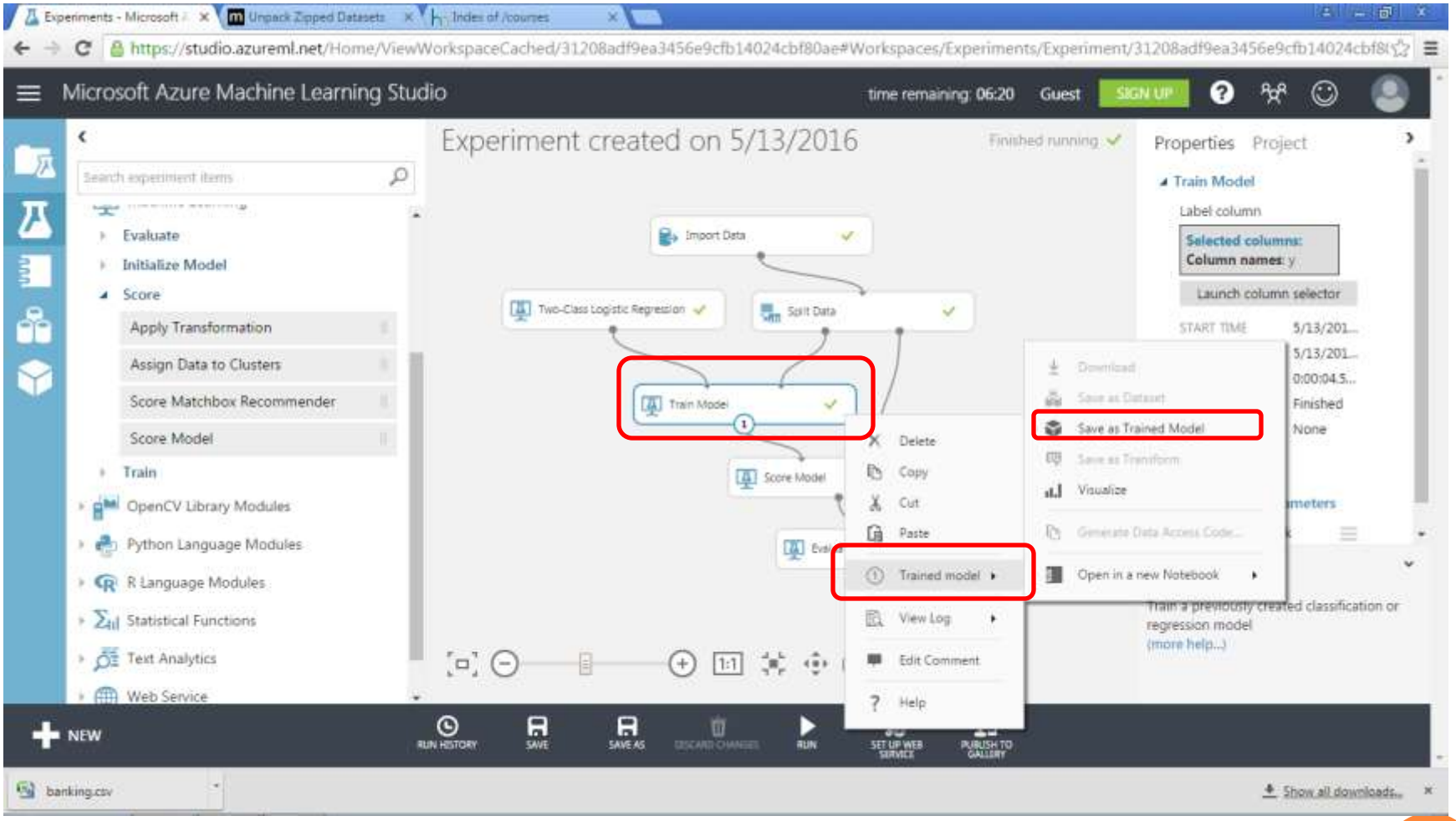

ROC, PRC ve AUC
Microsoft Azure Machine Learning Studio
Experiment created on 5/13/2016 › Evaluate Model › Evaluation results
ROC
True Positive Rate
False Positive Rate
Score Model
Evaluate Model
True Positive
558
False Negative
781
Accuracy
0.916
Precision
0.682
Threshold
0.5
AUC
0.935
NEW
banking.csv
Show all downloads...


Microsoft Azure Machine Learning Studio
Experiment created on 5/13/2016
Experiment created on 5/13/2016 › Evaluate Model › Evaluation results
Precision
Recall
Scored dataset
Score Model
Evaluate Model
True Positive 953
False Negative 386
Accuracy 0.902
Precision 0.537
False Positive 823
True Negative 10194
Recall 0.712
F1 Score 0.612
Threshold 0.25
AUC 0.935
1
0
Eşik değerine göre TP, FN, FP, TN, Doğruluk, Anma, Kesinlik ve F1
NEW
banking.csv


Experiments - Microsoft
Unpack Zipped Datasets
Index of /courses
https://studio.azureml.net/Home/ViewWorkspaceCached/31208adf9ea3456e9cfb14024cbf80ae#Workspaces/Experiments/Experiment/31208adf9ea3456e9cfb14024cb
Microsoft Azure Machine Learning Studio
time remaining: 06:24
Guest
Sign UP
Experiment created on 5/13/2016
Properties
Project
Experiment created on 5/13/2016 › Evaluate Model › Evaluation results
Recall
True Positive 953
False Negative 386
Accuracy 0.902
Precision 0.537
Threshold 0.25
AUC 0.935
False Positive 823
True Negative 10194
Recall 0.712
F1 Score 0.612
Positive Label 1
Negative Label 0
Score Bin
Positive Examples
Negative Examples
Fraction Above Threshold
Accuracy
F1 Score
Precision
Recall
Negative Precision
Negative Recall
Cumulative AUC
Skor grupları bazında performans istatistikleri
NEW
banking.csv
Show all downloads...

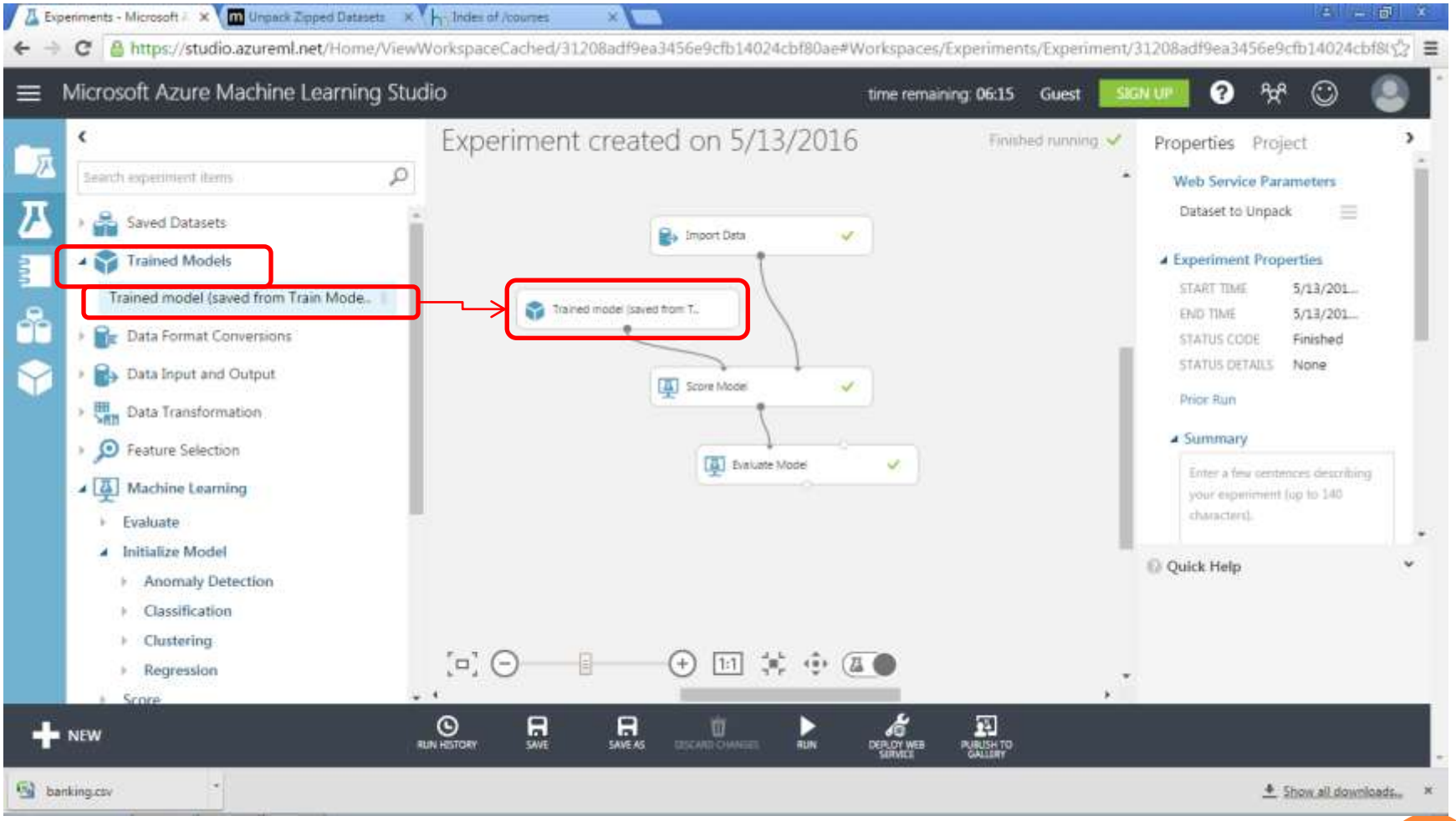
MS Azure ML

- Diagram modeli çalıştırıldıktan sonra, diagramın herhangi kısmı daha sonra kullanmak için kaydedilebilir
- Bunlara, orijinal veri, sınıflandırılmış veri, değerlendirme sonuçları ve ML modelinin kendisi dahildir


Microsoft Azure Machine Learning Studio
time remaining: 06:20
Guest
SIGN UP
Experiment created on 5/13/2016
Finished running
Properties
Project
Train Model
Label column
Selected columns:
Column names: y
Launch column selector
Import Data
Two-Class Logistic Regression
Split Data
Train Model
Score Model
Evaluate
Initialize Model
Score
Apply Transformation
Assign Data to Clusters
Score Matchbox Recommender
Score Model
Train
OpenCV Library Modules
Python Language Modules
R Language Modules
Statistical Functions
Text Analytics
Web Service
Delete
Copy
Cut
Paste
Trained model
View Log
Edit Comment
Help
Save as Trained Model
Visualize
Open in a new Notebook
Train a previously created classification or regression model
(more help...)
NEW
RUN HISTORY
SAVE
SAVE AS
RUN
banking.csv
Show all downloads...

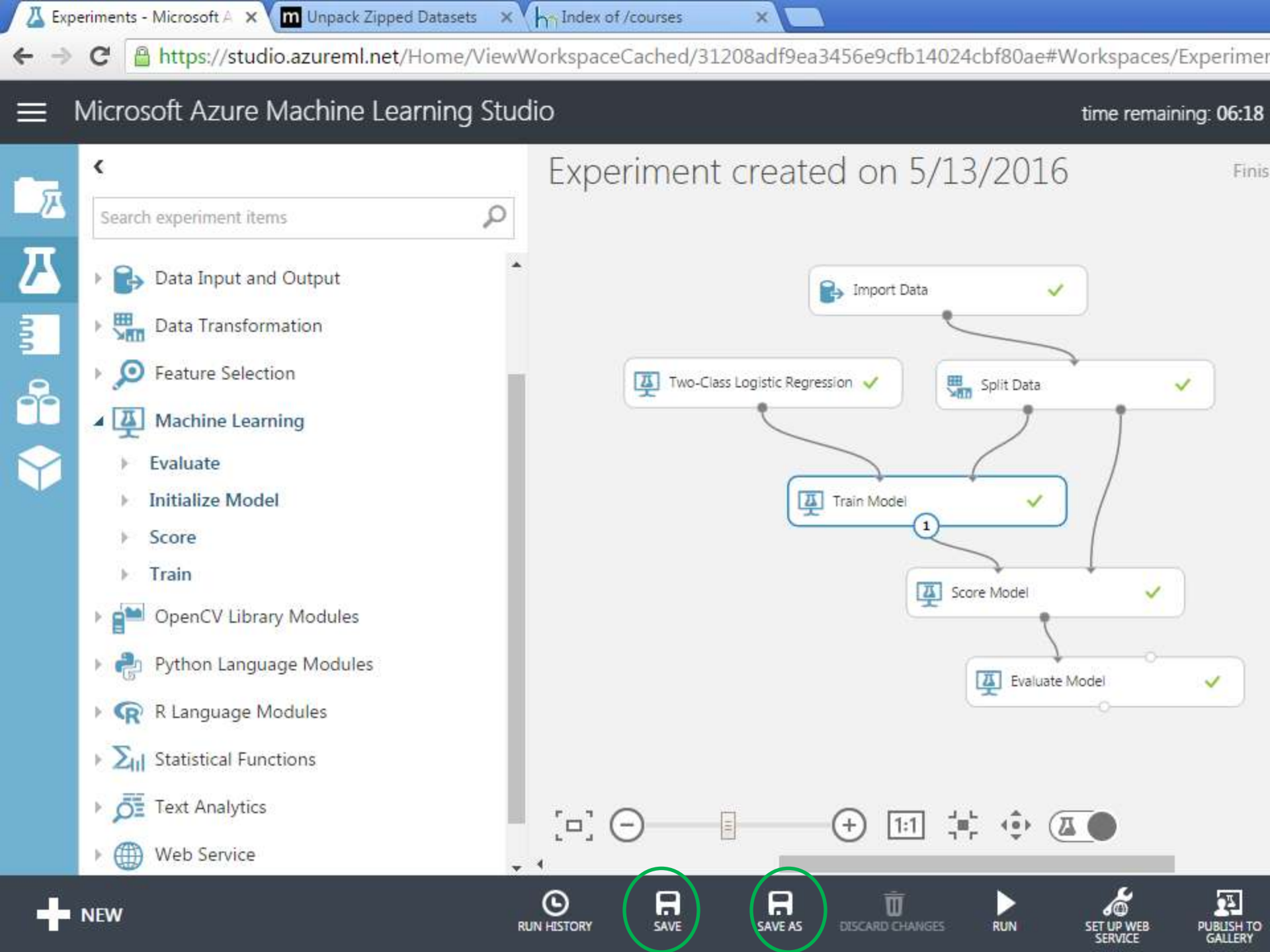
MS Azure ML

- Kayedilmiş model tabi daha sonra yeni diagramlarda kullanılabilir

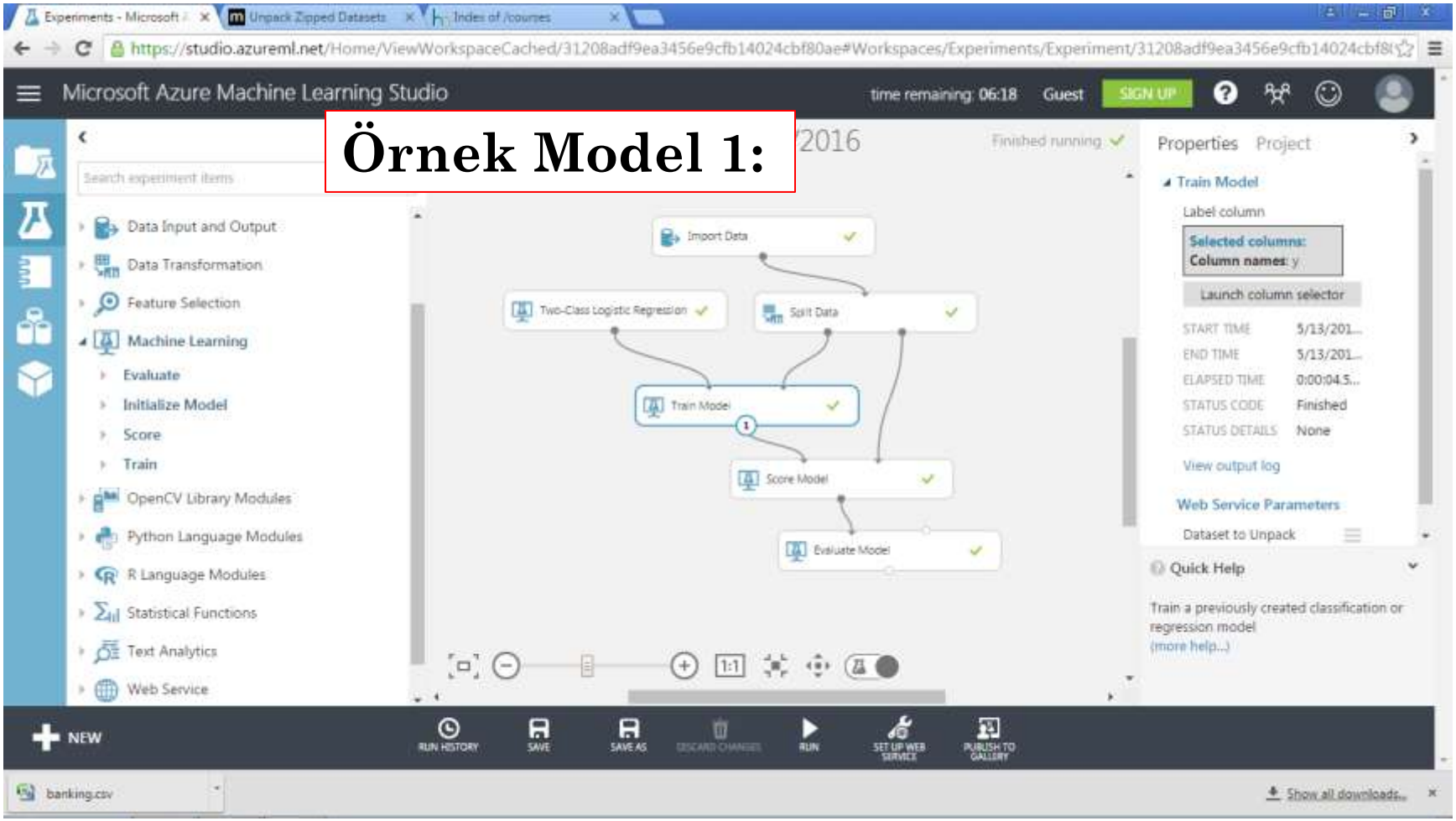

Microsoft Azure Machine Learning Studio
time remaining: 06:15
Guest
SIGN UP
Experiment created on 5/13/2016
Finished running
Saved Datasets
Trained Models
Trained model (saved from Train Mode...
Data Format Conversions
Data Input and Output
Data Transformation
Feature Selection
Machine Learning
Evaluate
Initialize Model
Anomaly Detection
Classification
Clustering
Regression
Score
Import Data
Score Model
Evaluate Model
Properties
Project
Web Service Parameters
Dataset to Unpack
Experiment Properties
START TIME
END TIME
STATUS CODE
Finished
STATUS DETAILS
None
Prior Run
Summary
Quick Help
NEW
RUN HISTORY
SAVE
SAVE AS
RUN
banking.csv
Show all downloads...

MS Azure ML

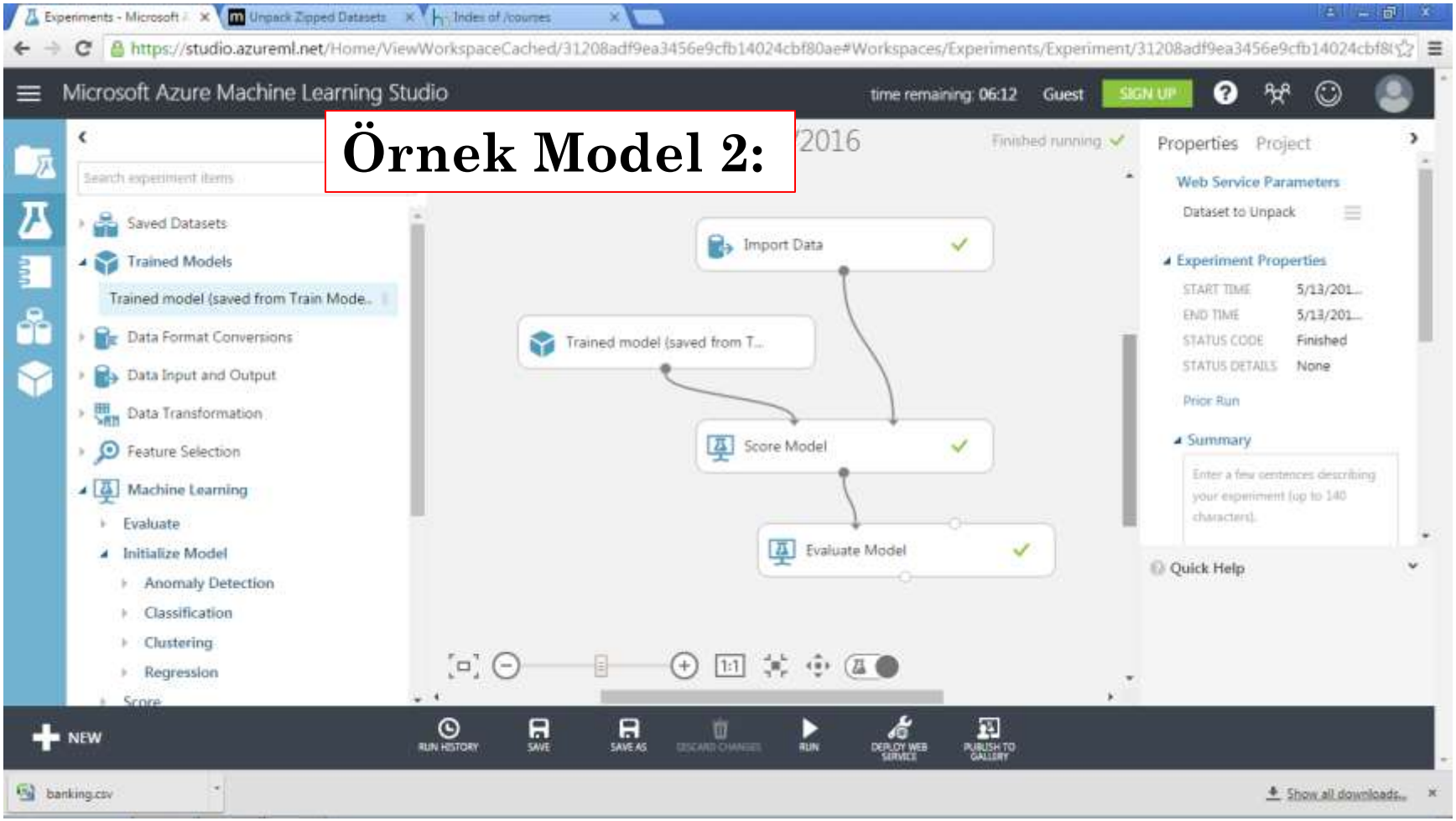
- Projenin tümü de benzer şekilde aşağıdaki “Save” veya “Save as” düğmeleri kullanılarak kaydedilebilir
- Not edelim ki, 8 saatlı deneme oturumunda bu şekilde tüm kaydedildiği veriler tabi 8 saat geçtikten sonra kaybolacaktır (!)


Experiments - Microsoft A
Unpack Zipped Datasets
Index of /courses
https://studio.azureml.net/Home/ViewWorkspaceCached/31208adf9ea3456e9cfb14024cbf80ae#Workspaces/Experimen
Microsoft Azure Machine Learning Studio
time remaining: 06:18
Experiment created on 5/13/2016
Finis
Search experiment items
Data Input and Output
Data Transformation
Feature Selection
Machine Learning
Evaluate
Initialize Model
Score
Train
OpenCV Library Modules
Python Language Modules
R Language Modules
Statistical Functions
Text Analytics
Web Service
Import Data
Two-Class Logistic Regression
Split Data
Train Model
1
Score Model
Evaluate Model
1:1
NEW
RUN HISTORY
SAVE
SAVE AS
DISCARD CHANGES
RUN
SET UP WEB SERVICE
PUBLISH TO GALLERY

Örnek Model 1:



Örnek Model 2:



Örnek Model 3: