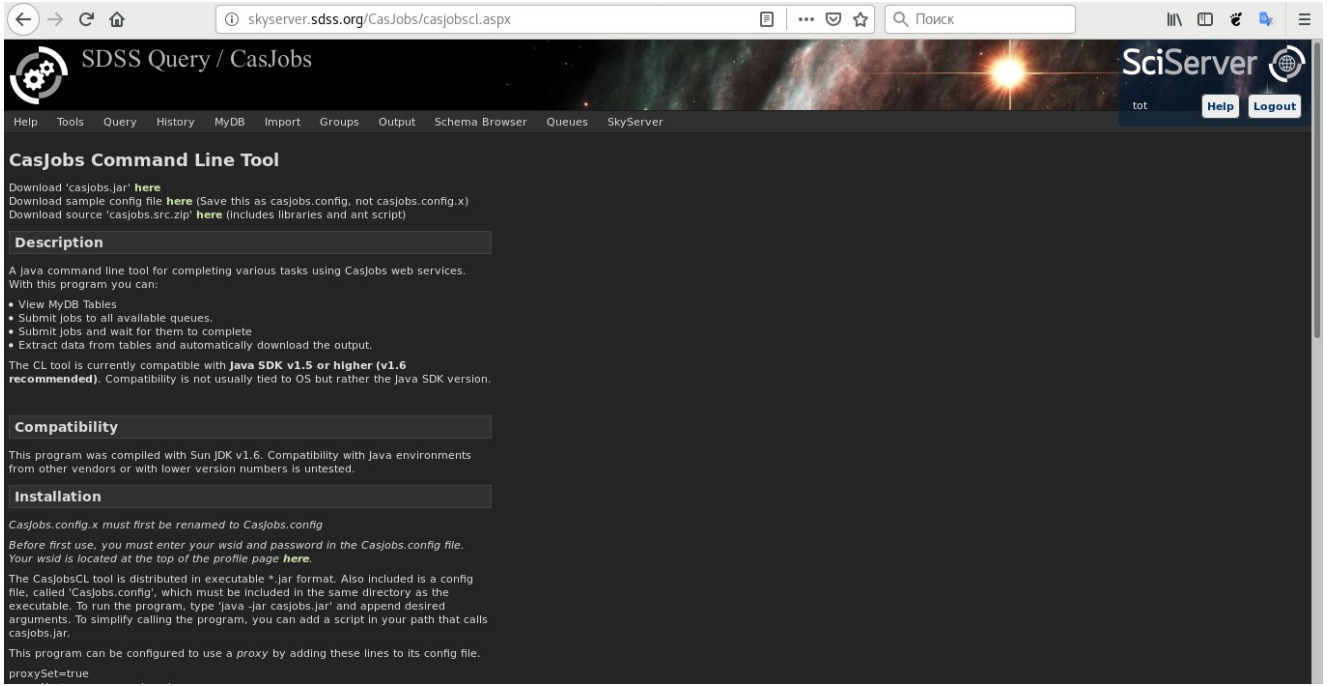
Analysis of far space objects using Azure ML

VOID

First — find data



Data

	u	g	r	i	z	class
0	21.41706	18.80885	17.70065	17.20334	16.81356	GALAXY
1	19.78651	18.34659	17.64557	17.25275	17.00746	GALAXY
2	23.64552	20.37921	19.46635	19.14754	18.99068	STAR
3	18.72268	17.38520	16.81134	16.51803	16.29502	GALAXY
4	19.52808	17.96541	17.03493	16.53754	16.14154	QSO
5	27.31197	19.97844	18.13124	17.20202	16.57967	STAR
6	25.30906	21.84281	20.25750	19.32818	18.81864	GALAXY
7	22.14849	20.87865	20.56403	20.47470	20.11038	STAR
8	23.28748	22.36641	20.82550	19.96027	19.54957	GALAXY
9	23.11800	21.94906	20.55173	19.68260	19.12432	GALAXY
10	23.30201	21.48842	19.74796	18.94013	18.46212	GALAXY
11	21.82781	21.41254	21.44766	21.28869	21.87833	STAR

Data taken from SDSS telescope contains differently filtered spectra. And our target is to predict class of object by spectra.

Our favorite classifier

```
from sklearn.ensemble import RandomForestClassifier
import pandas as pd
from azureml import Workspace

ws = Workspace(
```

- Accuracy 91% (cross validation with 5 folds)
- Azure ML Studio is usefull to select, train and validate model quickly.

Some science to get temperature

- We have implemented functions to get temperature from spectral data.

Interactive web-service

- We are using our trained model to predict what kind of space object user enters.
- We can say that it is a star, quasar or galaxy. Also, we can say temperature of this object.

Star visualization

- We decided to use 3d graphics to make visualizations of stars.
- Unity3D and WebGL helped us to do it.

Results

- Our service is targeted to scientists and enthusiasts. They can quickly check their spectral data from telescope.
- In future we can extend this service to restore missing data and predict subcategories(kinds of galaxies, stars, etc.)