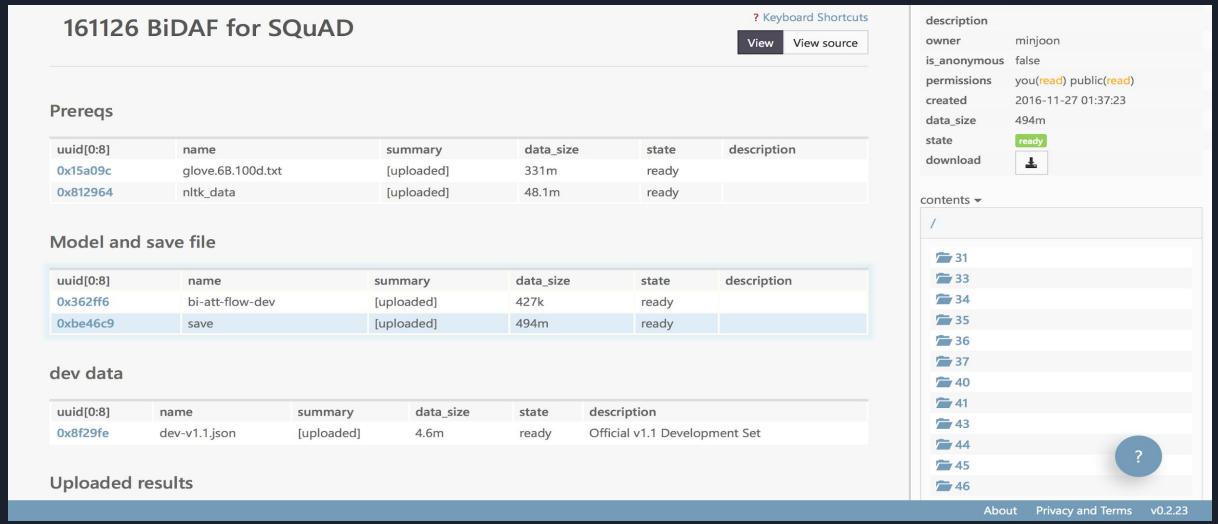
Building end-to-end QA model with reward based objective

TEAM REINFORCE (Prashant and Eti)

Baseline Models

- ***BiDAF:***
  - BiDAF baseline implementation code for SQuAD dataset available online
  - Options for training the model or to use pretrained weights available



Baseline Models

- **Setbacks (this week):**
  - Model has ~2.5M parameters
  - Trained with NVidia Titan X - requires at least 12GB of GPU RAM
  - Training converges at ~18k steps, takes ~4s per step
  - Training time:~20 hours
  - Almost impossible to train on CPU

Baseline Models

Some options:

- Use pretrained model (trained on SQuAD) - saved weights available online - and train it on SearchQA
- Not ideal as the datasets are quite different
  - Options: Do supervised fine tuning on model weights and use frozen embeddings
- Even loading the saved model takes >2 hours on CPU

```
Loading saved model from save/37/save
100%|| 10570/10570 [2:26:36<00:00,  1.20it/s]
single step 18000: loss=2.9900
dumping eval ...
100%|| 1/1 [00:00<00:00,  1.51it/s]
100%|| 10570/10570 [00:01<00:00, 8937.95it/s]
```

Baseline Models

BiDAF Model Pipeline:

- Preprocessing
- Training/ Loading
- Testing
- Output (a single JSON file)
- Evaluation

```
In [4]:
1 for i in range(10):
2     print(a.keys()[i],a[a.keys()[i]])
```

```
(u'57284e9fff5b5019007da154', u'2015')
(u'57284e9fff5b5019007da152', u'2010')
(u'57284e9fff5b5019007da153', u"Renmin University's campus in Haidian District")
(u'57284e9fff5b5019007da150', u'Singapore, London, and the downtown Streeterville neighborhood of Chicago')
(u'57284e9fff5b5019007da151', u'Seine')
(u'572918bd3f37b31900478018', u'major food staples')
(u'572918bd3f37b31900478015', u'Agriculture')
(u'572918bd3f37b31900478016', u'24%')
(u'572918bd3f37b31900478017', u'tea, horticultural produce, and coffee')
(u'57332e48d058e614000b5764', u'1 August 1944')
```

This Week's Progress

- Using the baseline model implementation to get some scores
  - Downloaded the pretrained embeddings and model weights
  - Ran the model on SQuaD dataset
  - Evaluated the generated output file
  - Results matched: as described in the paper

- Preprocessing SearchQA dataset
  - Preprocessing the SearchQA dataset to be in the same format as SQuAD

Next week’s work

- Use the saved model to get results on SearchQA
  - GPU Resources (either/or):
    - Either train our own model or use saved model
- Start writing our own implementation of BiDAF

Updated Timeline

Prashant:

- **Implement the baseline Bi-DAF model**
- Use pre-trained Glove embeddings to train the model
- Get baseline metric scores on both the datasets
- Do preliminary error analysis to figure out the shortcomings of the baseline model and common error types

- **Feb:** Implement baseline models and do preliminary analysis (on time - might be delayed)
- **March - April:** Implement our proposed models (on time)

Updated timeline

Eti:

- ~~Implement the Joint Model (still in the process)~~
- ~~Get baseline metric scores on both the datasets~~
- ~~Do preliminary error analysis to figure out the shortcomings of the baseline model and common error types~~
- Implementing BiDAF model