Jing Video:

Documentation

# Requirements and versions used

Python 3.8.5

Keras 2.4.3

numpy 1.18.5

pandas 1.1.1

pip 20.2.4

scikit-learn 0.23.2

scipy 1.4.1

tensorflow 2.3.0

torch 1.6.0+cu101

notebook 6.1.3

# General

The following Jupyter Notebook files were used for data exploration and processing.

**process\_data.ipynb**

This file is used for exploration and cleaning the dataset by removing nulls and unnecessary columns.

**akt\_process\_data.ipynb**

This file uses the output from **process\_data.ipynb** and performs more processing so it can be used in the following models: AKT, DKT, DKVMN, and SAKT.

**dktplus\_process\_data.ipynb**

This file uses the output from **process\_data.ipynb** and performs more processing so it can be used in the model DKT+.

**jsonCode.py** (this one is a normal python script run with **python jsonCode.py**)

This script was used for our initial data discovery and is still used to generate the JSON files needed for the processed dataset from **akt\_process\_data.ipynb**

# Processed Data

After the data has been processed it was moved to their respective folders in each model. This was done manually as a precaution so that previous datasets were not overwritten accidently.

The files in the folder **akt\_data/final** and the files in the folder **jsonFiles**

were moved to the folder **AKT-SAKT-DKVMN-DKT/data/assist2009\_pid**

And the files **dktplus\_processed\_data\_train.csv** and **dktplus\_processed\_data\_test.csv**

were moved to the folder **deep-knowledge-tracing-plus/data/assist2009\_updated**

# Models

Note: Our dataset was renamed to **assist2009** so it could just use the original commands to be run.

The following models use the code located in the folder **AKT-SAKT-DKVMN-DKT**.

Navigate to this folder in a command prompt and use the following commands.

## AKT

Default model

Python main.py –dataset assist2009\_pid –model akt\_pid

Non-Rasch model

Python main.py –dataset assist2009\_pid –model akt\_cid

## SAKT

Default model

Python main.py –dataset assist2009\_pid –model sakt\_pid --n\_head 4

Non-Rasch model

Python main.py –dataset assist2009\_pid –model sakt\_cid -- n\_head 4

Default model with 1 head

Python main.py –dataset assist2009\_pid –model sakt\_pid --n\_head 1

Default model with 0 blocks

Python main.py –dataset assist2009\_pid –model sakt\_pid --n\_head 4 –n\_block 0

Default model with 2 blocks

Python main.py –dataset assist2009\_pid –model sakt\_pid --n\_head 4 –n\_block 2

Default model with no dropout

Python main.py –dataset assist2009\_pid –model sakt\_pid --n\_head 4 –dropout 0

## DKT

Default model

Python main.py –dataset assist2009\_pid –model dkt\_pid

Non-Rasch model

Python main.py –dataset assist2009\_pid –model dkt\_cid

## DKVMN

Default model

Python main.py –dataset assist2009\_pid –model dkvmn\_pid

Non-Rasch model

Python main.py –dataset assist2009\_pid –model dkvmn\_cid

## DKT+

For this model you need to navigate to the folder **deep-knowledge-tracing-plus** and run the following command.

Default model

Python main.py