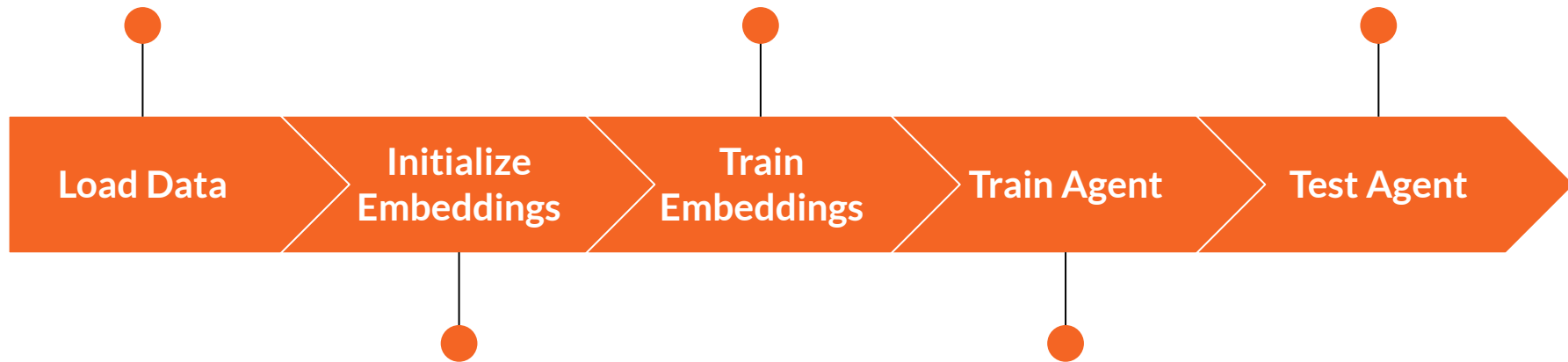

KGRE Rec - The Code

Load and preprocess
the data for easy
access in later stages

Train the KG
embeddings using a
SGD Optimizer

It does what it says!



Initialize the KG
embeddings, mapping nodes
to vectors of size 100

Train the agent using
an SAC algorithm
(Soft Actor-Critic)

Overview

utils.py

data_utils.py

preprocess.py

knowledge_graph.py

kg_env.py

transe_model.py

train_transe_model.py

train_agent.py

test_agent.py

Main Files

preprocess.py
train_transe_model.py
train_agent.py
test_agent.py

Auxiliary Files

utils.py
data_utils.py
knowledge_graph.py
kg_env.py
transe_model.py

utils.py

Main Contents

- Function to compute TFIDF
- Dictionary mapping different path patterns to numeric keys
- Create logger function

What does it do?

- Auxiliary file
 - Collection of utilities, that aid main files
-

data_utils.py

Main Contents

- class AmazonDataset
to load data files and save in the instance
- class AmazonDataLoader
dataloader for training graph embeddings

What does it do?

- Auxiliary file
 - Collection of utilities, that aid main files
-

transe_model.py

Main Contents

- class KnowledgeEmbedding
subclass of nn.module

What does it do?

- Initializes embeddings for entities, relations
 - Computes relevant losses for training
-

train_transe_model.py

Main Contents

- SGD Optimizer for training
Dynamic learning rate,
decreases to $1e-4$
- Extracts embeddings from the trained models, and saves them using the `save_embed` function

What does it do?

- Trains the graph embeddings
 - Loads the dataset stored earlier using `AmazonDataset`, with the help of `AmazonDataLoader`
-

train_agent.py

Main Contents

- Maximum entropy RL
- SAC algorithm for training the RL agent
Soft Actor-Critic

What does it do?

- Entropy augmented reward is maximized, entropy encourages exploration
-

Why maximize the entropy?

- **Increased robustness to hyperparameters:**
if the policy can tolerate highly random behavior during training, it is more likely to respond successfully to unexpected perturbations at test time
 - Policies with higher entropy are more random, which (intuitively) refers to “random” policies that still achieve a high reward.
-

test_agent.py

Main Contents

- Function to predict paths
- Function to evaluate the predicted paths

What does it do?

- Path Prediction
- Computes Precision, Recall, NDCG etc.

Thank you!
