1. Data and Source Code Description

In the PPT_MAIN, there are three subdirectories, code, dataset, and model.

1、The code folder contains PPT, LISA, RSMI, SPRIG, RSTAR and TPARINET with the entry code in main.py. In particular, the PPT directory includes four subdirectories, experiment, model, preprocess and query. The experiment subdirectory contains the experimental code which is elaborated in SECTION 6.1 and SECTION 6.2 ; the model subdirectory contains the code to generate the model; the preprocess subdirectory contains the code to preprocess the data ; the query contains the code for query processing.

2、The dataset contains two subdirectories, the sim and the chd. As the entire synthetic and real datasets are large, we only upload some examples for illustration. The former stores 196573 points of the sim dataset, and the latter stores 175496 points of the chd dataset.

3、The model stores all the generated models and indexes during the training. This folder contains PPT, LISA, RSMI, SPRIG, RSTAR and TPARINET.

2. How to run the program

We run **main.py** to perform all the experiments in the paper.

Description of the function called in the main.py file

1. separate_train()：It is to construct the PPT model over both the sim and chd datasets, and the generated model is stored in model\PPT.

2. range_ ()：It is to perform the range query based on the PPT model stored in model\PPT.

3. point_ ()：It is to perform the point query based on the PPT model stored in model\PPT.

4. tparinet(): It is to construct T-PARINET and process the point and range queries over the sim and chd datasets, where the index is saved at model\TPARINET.

5. lisa (): It is to construct LISA and process the point and range queries over the

sim and chd datasets, where the index is saved at model\LISA.

6. sprig (): It is to construct SPRIG and process the point and range queries over the sim and chd datasets, where the index is saved at model\SPRIG.

7. rsmi(): It is to construct RSMI and process the point and range queries over the sim and chd datasets, where the index is saved at model\RSMI.

8. rstar(): It is to construct R* and process the point and range queries over the sim and chd datasets, where the index is saved at model\RSTAR.

3. The experimental code in the paper

1、Section 6.1.1 corresponds to code\PPT \experiment\diff_partition.py.

2、Section 6.1.2 corresponds to code\ PPT \experiment \diff_data_size.py.

3、Section 6.1.3 corresponds to code\ PPT \experiment \diff_zsr.py.

4、Section 6.1.4 corresponds to code\ PPT \model\dp_plane.py.

5、Section 6.2 corresponds to code\ PPT \model \diff_IO.py.

6、For Section 6.3, we need to run code\main.py file to get the measurements.

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