CS Dept. student job hunting tracking system-Midterm

1. Team Member

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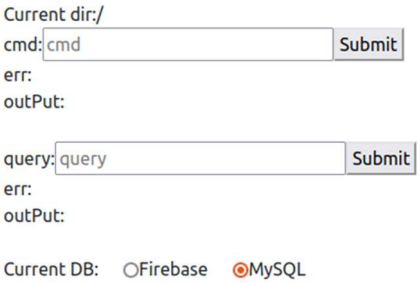
2. DB Interaction schema

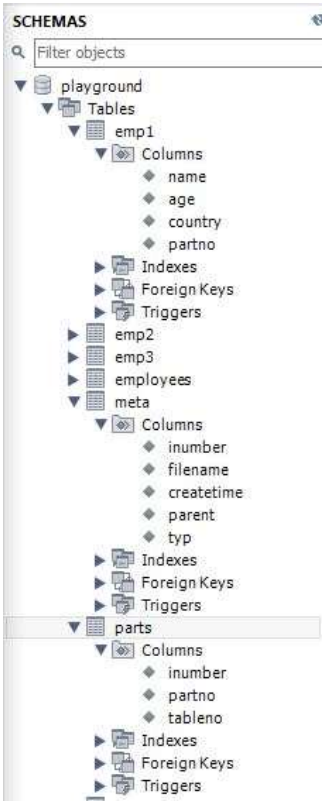
   Create/Update/Delete: changes are made in Firebase and My SQL simultaneously for easy sync.
   Read: Available to choose the DB source to read from (though content would be the same)

3. Web app Interface



   There are 3 major parts in the app respectively for command, query and source DB switch. The command form is for part 1, while the query form is for part 2.
   Forms for commmand and query are basically the same: an input box for command+parameters/query, a submit button, and output for error and result, except that the command form also displays current directory that help users to traverse the file system.
   The sourceDB handler at below implements the DB switch functionality, allowing us to test data correctness and consistency between DBs.

4. MySQL Database Structure



The ‘meta’ table and ‘parts’ table together emulate the name node of HDFS, where ‘meta’ table stores the directory structure of the file system (‘parent’ attribute storing the inumber of parent dir of current file/dir, ‘type’ attribute can be ‘d’-dir/’f’-file), and ‘parts’ stores the relationship of a file and different partitions (‘tableno’ attribute). ‘parts’ table is decoupled from ‘meta’ table to eliminate partial dependency.

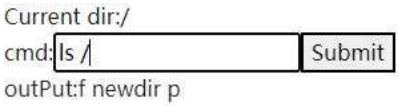
5. Commands test with MySQL-simulated file system
   a. mkdir
      Given the initial state of name node,

inumber	filename	createtime	parent	typ
0	home	Sun Oct 30 2022 02:38:50 GMT-0700 ...	NULL	d
1	f	Sun Oct 30 2022 03:00:50 GMT-0700 ...	0	d
8485	p	Sun Oct 30 2022 04:00:50 GMT-0700 ...	0	d
NULL	NULL	NULL	NULL	NULL

      We add a new dir called ‘newdir’, then web app and DB will look like:

inumber	filename	createtime	parent	typ
0	home	Sun Oct 30 2022 02:38:50 GMT-0700 ...	NULL	d
1	f	Sun Oct 30 2022 03:00:50 GMT-0700 ...	0	d
8348	newdir	Mon Oct 31 2022 15:10:38 GMT-0700 ...	0	d
8485	p	Sun Oct 30 2022 04:00:50 GMT-0700 ...	0	d

   b. ls
      Now we see the content of root dir ‘/’:



   c. put
      We upload a file ‘emp.json’ to the file system, under the ‘/newdir’, and split the content into 3 parts

      ,with content of ‘emp.json’ being

      , and the DB will be like:

inumber	filename	createtime	parent	typ
0	home	Sun Oct 30 2022 02:38:50 GMT-0700 ...	NULL	d
1	f	Sun Oct 30 2022 03:00:50 GMT-0700 ...	0	d
8348	newdir	Mon Oct 31 2022 15:10:38 GMT-0700 ...	0	d
8485	p	Sun Oct 30 2022 04:00:50 GMT-0700 ...	0	d
9476	emp.json	Mon Oct 31 2022 15:14:46 GMT-0700 ...	8348	f

inumber	partno	tableno
9476	2534	1
9476	3422	2
9476	4776	3

```
5 •  SELECT * FROM playground.emp1;
```

Result Grid | Filter Rows:

name	age	country	partno
Aike	26	China	2534

```
SELECT * FROM playground.emp2;
```

Result Grid | Filter Rows:

name	age	country	partno
Oike	25	China	3422

```
SELECT * FROM playground.emp3;
```

Result Grid | Filter Rows:

name	age	country	partno
Yike	29	China	4776

d. cat
if we try to see the content of 'emp.json' we just uploaded, we can see the whole content is displayed correctly:

e. getPartitionLocatons
and we also can retrieve all location of partitions, which corresponds to the 'partno' attribute in 3 'emp1' table respectively.

f. readPartition
now if we want to retrieve the 3rd partition of 'emp.json', we can see the corresponding content

g. rm
lastly, if we remove the 'newdir' dir we added at the 'mkdir' step, we can see the dir is removed successfully from updated 'meta' and 'parts' table:

inumber	filename	createtime	parent	typ
0	home	Sun Oct 30 2022 02:38:50 GMT-0700 ...	NULL	d
1	f	Sun Oct 30 2022 03:00:50 GMT-0700 ...	0	d
8485	p	Sun Oct 30 2022 04:00:50 GMT-0700 ...	0	d

inumber	partno	tableno
NULL	NULL	NULL

6. FireBase Database Structure

'dataNode' & 'nameNode' serves as 2 root path for actual data and file system structure respectively.
Current Firebase version is written with python, we are undergoing the process of migrating to javascript.

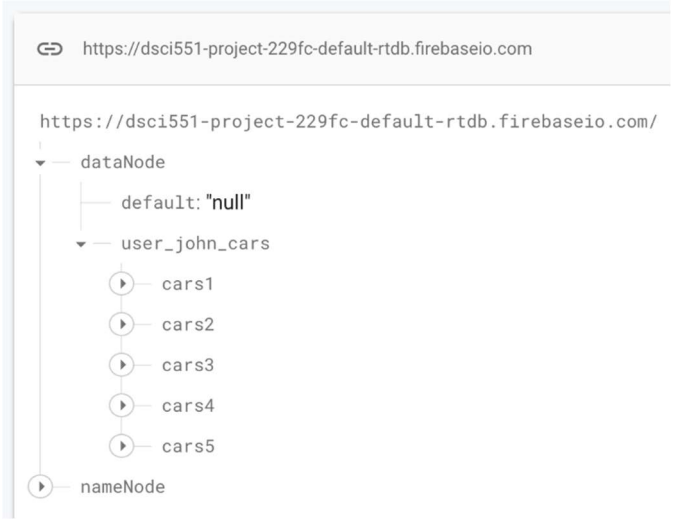
7. Commands test with Firebase-simulated file system
   a. mkdir

We make dir ‘john’, ‘mary’ under ‘user’ respectively.

b. put

We upload cars.csv used in homework 1 to the Firebase, in nameNode we have

, while in dataNode we have



c. rm

now when we remove this cars.csv, in nameNode:

in dataNode: