

DV Interview Assignments

Enclosed is description of 2 coding/design assignments.

Assignment 1: Python parser.

Assignment 2: DB Design: Focus on design of survey question/responses table.

Assignment 1:

1. **Python parser:** Write a python parser which takes auth.log file as input, (optional date) and return following summaries. Sample auth.log file is attached.

Python parser.py -file /foo/auth.log [--date DATE]

of "Failed password" and # of "reverse mapping" attempts distributed by IP addresses for a given date.

of failed password attempts:

```
{ "2018-04-13" : { root : { "TOTAL" : 10,
                           "IPLIST" : { "IP1" : 4 , "IP2": 6},
                           { "BUSER" : { "TOTAL" : 18,
                                           "IPLIST" : { "IP3" : 7 , "IP4": 11} }}
  "YYYY-MM-DD" : { user: { total: value, IPLIST: {} } }
}
```

Above can be interpreted as there were 10 failed passwords attempts made for user root on "Date" and 4 came from IP1, and 6 came from IP2. If date is not given, then report all entries in the log file.

For reverse mapping, instead of user, report getaddrinfo string.

```
{ "DATE" : { "undefined.datagroup.ua" : {TOTAL: 1, IPLIST: {} } }
```

Hints: Strings to look out for

Reverse mapping#: "reverse mapping checking getaddrinfo for **undefined.datagroup.ua** [93.183.207.5] failed - POSSIBLE BREAK-IN ATTEMPT!"

Failed password: "Failed password for **root** from **123.183.209.132** port 63858 ssh2"

Assignment 2: Design database tables to save feedback templates and responses for a **Course-survey-Feedback system**.

Background: A SaaS Application allows university administrator to create feedback surveys (Survey = Template), which is sent to university students and collect student responses. Surveys are generally sent to enrolled students in last week of semester.

See **Figure 1** for sample feedback template.

See **Figure 2** for sample edited-feedback template.

Survey Feedback Assumptions:

- Survey can have any number of questions.
- Students may or may not complete/fill feedback surveys.
- Generally, same survey is sent for all courses in a semester. Administrator will like to have ability to design/send custom survey for courses. Example: Creates survey A for courses 1,2,3 and creates survey B for courses 4,5 offered in a semester.
- Assume that there is a student table(sid, student_name, email), course table(cid, course_name) and semester_offering(soid, cid, startdate, enddate), Students_course_Registration table (sid as integer, soid as integer) both are foreign keys to student/semester_offering tables and composite indexes setup). You can make another assumptions as necessary here. Focus of design to be on survey templates/responses table (please note your assumptions in your submission)

GOAL: Design table(s) to save survey template questions and the corresponding responses. And write following queries based on your tables design:

- Show distribution of courses by number of votes(ranked 3 or higher) for last semester (startdate, enddate). Distribution: show only top 4 courses and aggregate all other courses count in 'Others'.
Example: Course_name, #_of_votes_received(students liked course >=3)
C1, 200
C2, 100
C3, 90
C4, 80
Others, 500
- Show list of all survey questions and corresponding student's responses received for a particular course id and semester (startdate, enddate).
- Get a list of all courses in last 3 years which were ranked 3 or higher by 80% of the enrolled students for each course.

Figure 1: Feedback Template 1

Name:

Did you like the course? (Rank 1 – 5)

How many classes you missed in the semester (out of 20) ?

Figure 2: Feedback Template 2

Name:

Did you like the course? (Rank 1 -5)

What topics you expected to learn about in the course?

Did the class start and end of time? Yes/No?