T3 Engineer Candidate Exercise

|  |  |
| --- | --- |
| Date: |  |
| Name of applicant: |  |
| Name of interviewer: | Hazim Gara |

Dear applicant,

Below is a test that should take approximately 3-4 hours. However, you can send it after 3 days and if you feel that you need more time, please feel free to inform me about it. Also feel free to ask if you have any clarification.

General Instructions: Please write your answers in a new file (It doesn’t matter if it’s a Word document, text file, PDF, Open Document, GIF, XML… ;-))

That’s it.

**SECTION 1 - SQL**

**Part1:**

Classes More Than 5 Students

Question:

Please list out all classes which have more than or equal to 5 students.

For example, the table:

+---------+------------+

| student | class      |

+---------+------------+

| A       | Math       |

| B       | English    |

| C       | Math       |

| D       | Biology    |

| E       | Math       |

| F       | Computer   |

| G       | Math       |

| H       | Math       |

| I       | Math       |

+---------+------------+

Should output:

+---------+

| class   |

+---------+

| Math    |

+---------+

Note:

The students should not be counted duplicate in each course.

**Part2: *you can choose 2 questions (out of 4)***

Look at the following scheme that contains two tables - entry and flavor\_asset.  
In the table entry we save the information about the entries in our system, on the flavor\_asset table we save all the flavors associated with specific entry.

**entry**: (id: *VARCHAR,* partner\_id: *INT*,name: *VARCHAR*, status: *INT*, media\_type: *SMALLINT*, created\_at: *DATETIME*)

**flavor\_asset**: (id: *VARCHAR,* partner\_id: *INT,* entry\_id*: VARCHAR,* status: *INT*, created\_at: *DATETIME*)

The field id is a primary key in both tables.  
The following foreign key is defined: **flavor\_asset**(entry\_id)->**entry**(id).

**QUESTION 1**

Write SQL query that returns the ids of all the entries in status 2 for partner\_id 2264441

**QUESTION 2**

Write SQL query that returns the ids of all the entries that were created during February 2018 in status 2 for partner 2264441

**QUESTION 3**

Write SQL query that returns entry id, entry name and the number of flavor assets associated with this entry id for all the entries in status 2 for partner\_id 2264441  
  
**QUESTION 4**

Write SQL query that returns entry id, entry name and all the flavor assets associated with this entry id for all the entries in status 2 for partner\_id 2264441

**SECTION 2 – Shell question / Bash Script**

Write a bash script to calculate the frequency of each word in a text file words.txt.

For simplicity sake, you may assume:

* words.txt contains only lowercase characters and space ' ' characters.
* Each word must consist of lowercase characters only.
* Words are separated by one or more whitespace characters.

**Example:**

Assume that words.txt has the following content:

the day is sunny the the

the sunny is is

Your script should output the following, sorted by descending frequency:

the 4

is 3

sunny 2

day 1

**SECTION 3 – Java Script**

Using only JavaScript !!! try to do the following DOM manipulations.

(Please note, that you are allowed to use jQuery,ES6 or any JS framework).

Create simple HTML page with basic info, such as sentence, and proceed with the below changes.

1. Try to change the color of the H1 element to blue.
2. Try to create an additional P element with the following your full name.
3. Try to change the color and font-family of the P elements and color.

**SECTION 4 – KMC Functionality**

KMC – Kaltura Management Console is a powerful and useful tool for managing your media entries.  
The following questions will be focusing on the new KMC and your ability to learn an unfamiliar product quickly.

Enter to KMC - https://kmc.kaltura.com/index.php/kmcng using the following credentials:

**User:** tier3.kaltura@gmail.com   
**Password:** Passme1!

**1.** Find the partner ID in your KMC account, Provide a Step by step to locate the partner ID and write it down as part of your answer.

**2.** Change the current thumbnail of a video.  
(Specify the name or entry id of the video you’ve updated)

**3.** Restrict a video to play only tomorrow and only in Israel?  
(Specify the name of the video you’ve updated)

**SECTION 5 – API and network debugging**

For this part you will need to download [Fiddler](https://www.telerik.com/download/fiddler) or use Chrome dev tools to capture API calls, and also use the [Kaltura API](https://www.kaltura.com/api_v3/testmeDoc/) for basic actions.

For each action you perform in the API, you will need a Kaltura session (KS string). Read more about it and how to create one in the following documentation:

<https://knowledge.kaltura.com/using-kalturas-api-test-console-introduction>

<https://knowledge.kaltura.com/kalturas-api-authentication-and-security>

<https://knowledge.kaltura.com/how-start-kaltura-session-using-testme-console#kaltura+session>

1. Create an admin KS for your KMC user using the TestMe console.
2. Take an Entry Id from your KMC account and find the following details about this entry using the Kaltura API:

* Entry name
* Duration (in minutes):
* Width:
* Flavor Params:
* Status (provide the textual value):
* Moderation status (provide the textual value):
* Creation time (provide the value in EST time zone):

Please specify the service(s) and action(s) you used to locate the above information:

Service\_\_\_\_\_\_\_\_\_

Action\_\_\_\_\_\_\_\_\_\_

1. Change the name of the entry to “This entry name shows that I’m starting to understand the Kaltura API”

Please specify the service(s) and action(s) you used to apply the above change:

Service\_\_\_\_\_\_\_\_

Action\_\_\_\_\_\_\_\_\_

Once you’re done, refresh the KMC to check and verify that the changes you made through API are reflected there.

1. For this task you will need Fiddler or Chrome dev tools. Grab a thumbnail via API from the 4th second into a video (meaning, 00:04 minutes).
   1. First, do it from the KMC itself when you have a network capture tool (Fiddler or Chrome dev tools) open in the background and recording.
   2. After you’ve accomplished this from the KMC, check out the network calls and try to identify the API calls that took place and their parameters.
   3. Go to the [testme console](https://www.kaltura.com/api_v3/testme/) and apply the same calls with the relevant parameters on a different entry.
   4. Please attach a short screen recording of the process.

**SECTION 6 – Kaltura API**

Instructions: ***you can chose 2 question (out of 3), also please refer to the code samples at the end of this document.***

Bellow you will find 3 questions which refers to a code sample that you can find afterwards.

The code sample is written using Kaltura client library API and attached in the following languages for your own convenience:

[JAVA](#JAVA)

[PHP](#PHP)

[PYTHON](#PYTHON)

[C#](#C)

[JAVASCRIPT](#javascript)

Please notice that the samples content is the same! There is no need to read it in different languages, choose one you are familiar with and answer all the questions using that language.

In order to answer the questions you will probably need to use Kaltura API documentation and API console, you can find them here:

<https://developer.kaltura.com/api-docs/Overview>  
<https://www.kaltura.com/api_v3/testme/>

if you want to test anything using the API console or see code examples you can use the KMC credentials mentioned in Question1.

**QUESTION 1**  
Enter to KMC - https://kmc.kaltura.com/index.php/kmcng using the following credentials:

**User:** tier3.kaltura@gmail.com   
**Password:** Passme1!

On the content tab under entries you can see a list of all the entries on the given account, one of them has the following id: 1\_lv1lmqhk.

Look on the attached code sample (in the programming language you prefer), the code return a list of entry objects as result. The object with id 1\_lv1lmqhk won’t return in this list, try to provide possible reasons why. Which things can be changed in the code?

**QUESTION 2**

Now let’s look on a different id - 1\_jxfxwaij

Try to find it in KMC (look in different places, this is not necessarily in the same place as it was in the last question) or using the API console.

The object with this id won’t be printed out as part of the results, but this time it can be caused due to something else. Which changes can be done in the code to make the script return at least the existing results + the mention id and id’s like her?

**QUESTION 3**

Add the following to the sample code using Kaltura API:

Function that adds to the given partner a category named kalturaTest (information about the partner like the partner id can be found under setting->account setting in KMC)

**SECTION 7 – Write Script/Code**

You're given a CSV file (see example link below) containing office reservation data. Each line represents a reservation of a unique office. There are four columns in each line: Capacity, Monthly Price, Start Day, and End Day. The fourth column "End Day" could be empty, meaning the office is indefinitely reserved starting from the Start Day.

Write a script using the language of your choice that, given a month and a year (YYYY-MM), reads a CSV file and answers the following questions:

A. What is the revenue for the month? Revenue is calculated according to the monthly price of the reserved offices. If an office is partially reserved for a given month, the revenue should be prorated based on the monthly price. For example: 2, 1500, 2014-03-01, 2014-04-15 counts as $750 in revenue for April because the reservation was for half of the month.

B. What is the total capacity of the unreserved offices for the month? An office is considered reserved if it was reserved even for a single day for the given month.

The expected output should look like this:

\* 2000-01: expected revenue: $0, expected total capacity of the unreserved offices: 266

\* 2018-01: expected revenue: $75,500, expected total capacity of the unreserved offices: 137

Please provide the following:

\* Attach the source code to the email and write instructions on how to run it

\* Fill in the results for the following inputs:

\* 2013-01:

\* 2013-06:

\* 2014-03:

\* 2014-09:

\* 2015-07:

1. How much time did you spend?

2. What was the most difficult thing for you?

3. What technical debt would you pay if you had one more iteration?

****

**GOOD LUCK!**

**Code Samples:**

JAVA:

package com.kaltura.code.example;

import com.kaltura.client.enums.\*;

import com.kaltura.client.types.\*;

import com.kaltura.client.services.\*;

import com.kaltura.client.KalturaApiException;

import com.kaltura.client.KalturaClient;

import com.kaltura.client.KalturaConfiguration;

class CodeExample {

public static void main(String[] args) {

try {

KalturaClient client = CodeExample.generateKalturaClient();

KalturaBaseEntryFilter filter = new KalturaBaseEntryFilter();

filter.statusEqual = KalturaEntryStatus.READY;

filter.typeEqual = KalturaEntryType.MEDIA\_CLIP;

filter.orderBy = KalturaBaseEntryOrderBy.CREATED\_AT\_ASC;

KalturaFilterPager pager = new KalturaFilterPager();

pager.pageSize = 30;

pager.pageIndex = 1;

Object result = client.getBaseEntryService().list(filter, pager);

System.out.println(result);

} catch (KalturaApiException e) {

e.printStackTrace();

}

}

public static KalturaClient generateKalturaClient() throws KalturaApiException {

KalturaConfiguration config = new KalturaConfiguration();

config.setEndpoint("https://www.kaltura.com/");

KalturaClient client = new KalturaClient(config);

String session = client.getSessionService().start(

"00c05272a1fe1cb5b2d9112d52f42bd0",

"tier3.kaltura@gmail.com",

KalturaSessionType.ADMIN,

2264441);

client.setKs(session);

return client;

}

}

PHP:

<?php

require\_once('lib/KalturaClient.php');

$config = new KalturaConfiguration(2264441);

$config->serviceUrl = 'https://www.kaltura.com';

$client = new KalturaClient($config);

$ks = $client->session->start(

"00c05272a1fe1cb5b2d9112d52f42bd0",

"tier3.kaltura@gmail.com",

KalturaSessionType::ADMIN,

2264441);

$client->setKS($ks);

$filter = new KalturaBaseEntryFilter();

$filter->statusEqual = KalturaEntryStatus::READY;

$filter->typeEqual = KalturaEntryType::MEDIA\_CLIP;

$filter->orderBy = KalturaBaseEntryOrderBy::CREATED\_AT\_ASC;

$pager = new KalturaFilterPager();

$pager->pageSize = 30;

$pager->pageIndex = 1;

try {

$result = $client->baseEntry->listAction($filter, $pager);

var\_dump($result);

} catch (Exception $e) {

echo $e->getMessage();

}

?>

PYTHON:

from KalturaClient import \*

from KalturaClient.Plugins.Core import \*

config = KalturaConfiguration(2264441)

config.serviceUrl = "https://www.kaltura.com/"

client = KalturaClient(config)

ks = client.session.start(

"00c05272a1fe1cb5b2d9112d52f42bd0",

"tier3.kaltura@gmail.com",

KalturaSessionType.ADMIN,

2264441)

client.setKs(ks)

filter = KalturaBaseEntryFilter()

filter.statusEqual = KalturaEntryStatus.READY

filter.typeEqual = KalturaEntryType.MEDIA\_CLIP

filter.orderBy = KalturaBaseEntryOrderBy.CREATED\_AT\_ASC

pager = KalturaFilterPager()

pager.pageSize = 30

pager.pageIndex = 1

result = client.baseEntry.list(filter, pager);

print(result);

C#:

using System;

using System.Collections.Generic;

using System.Text;

using System.IO;

using Kaltura;

using Kaltura.Enums;

using Kaltura.Types;

using Kaltura.Request;

using Kaltura.Services;

using System.Threading;

namespace Kaltura {

class CodeExample {

static void Main(string[] args) {

Client client = CodeExample.createKalturaClient();

bool done = false;

BaseEntryFilter filter = new BaseEntryFilter();

filter.StatusEqual = EntryStatus.READY;

filter.TypeEqual = EntryType.MEDIA\_CLIP;

filter.OrderBy = BaseEntryOrderBy.CREATED\_AT\_ASC;

FilterPager pager = new FilterPager();

pager.PageSize = 30;

pager.PageIndex = 1;

OnCompletedHandler<ListResponse<BaseEntry>> handler = new OnCompletedHandler<ListResponse<BaseEntry>>(

(ListResponse<BaseEntry> result, Exception e) =>

{

CodeExample.PrintObject(result);

done = true;

});

BaseEntryService.List(filter, pager)

.SetCompletion(handler)

.Execute(client);

while (!done) {

Thread.Sleep(100);

}

}

static Client createKalturaClient() {

Configuration config = new Configuration();

config.ServiceUrl = "https://www.kaltura.com/";

Client client = new Client(config);

int partnerId = 2264441;

string secret = "";

string userId = "";

SessionType type = SessionType.ADMIN;

int expiry = 86400;

string privileges = "";

client.KS = client.GenerateSession(partnerId, secret, userId, type, expiry, privileges);

return client;

}

public static void PrintObject<T>(T obj) {

var t = typeof(T);

var props = t.GetProperties();

StringBuilder sb = new StringBuilder();

foreach (var item in props)

{

try {

sb.Append(item.Name+ ": " +item.GetValue(obj,null)+"\n");

} catch (Exception ex) {

Console.WriteLine(ex.ToString());

}

}

sb.AppendLine();

Console.WriteLine(sb.ToString());

}

}

}

JAVASCRIPT:

<script src="https://ajax.googleapis.com/ajax/libs/jquery/3.1.1/jquery.min.js"></script>

<script src="/js/kaltura/KalturaFullClient.min.js"></script>

<script>

var config = new KalturaConfiguration(2264441);

config.serviceUrl = 'https://www.kaltura.com';

var client = new KalturaClient(config);

// Note: this is meant only as a sample.

// You should NEVER generate sessions on the client,

// as this exposes your Admin Secret to users.

// Instead, generate a session on the server and pass the

// KS to the client.

KalturaSessionService.start(

"00c05272a1fe1cb5b2d9112d52f42bd0",

"tier3.kaltura@gmail.com",

2,

2264441)

.execute(client, function(success, ks) {

if (!success || (ks.code && ks.message)) {

console.log('Error starting session', success, ks);

} else {

client.setKs(ks);

var filter = {objectType: "KalturaBaseEntryFilter"};

filter.statusEqual = "2" /\* KalturaEntryStatus.READY \*/;

filter.typeEqual = "1" /\* KalturaEntryType.MEDIA\_CLIP \*/;

filter.orderBy = "+createdAt" /\* KalturaBaseEntryOrderBy.CREATED\_AT\_ASC \*/;

var pager = {objectType: "KalturaFilterPager"};

pager.pageSize = 30;

pager.pageIndex = 1;

KalturaBaseEntryService.listAction(filter, pager)

.execute(client, function(success, results) {

if (!success || (results && results.code && results.message)) {

console.log('Kaltura Error', success, results);

} else {

console.log('Kaltura Result', results);

}

});

}

});

</script>