



# Quantum Database Jumpers

09.01.2019

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Assignment #1  
CSC 370

## Our Team:

We have assembled the finest 3rd year Computer Science students in the nation to take on this specific project. Every member of the team serves a unique purpose that adds to the synergy of the project. In no particular order we introduce our team:

**Nat Dring:** *ndring*, [natdring97@gmail.com](mailto:natdring97@gmail.com)

- Nat is our SQL and database architecture specialist. He has recently completed a Co-op in which he frequently wrote and interacted with SQL code.

**Oliver Tonnesen:** *otonnesen*, [oliver@tonnesen.com](mailto:oliver@tonnesen.com)

- Oliver is our lead software architect. His experience with Hackathons and mathematics makes him an invaluable asset to this project.

**Paige Loffler:** *paigeloffler*, [paige.lofflerr@gmail.com](mailto:paige.lofflerr@gmail.com)

- Paige is the head of our research and development department. She is committed to always staying ahead of current database trends and development methods.

**Parmbeer Johal:** *parmj*, [parmbeerjohal@gmail.com](mailto:parmbeerjohal@gmail.com)

- Parm started writing code at the early age of 7. His love of software, specifically in the realm of database architecture, makes him a joy to have around.

**Braydon Horcoff:** *braydonh*, [braydonhorcoff@gmail.com](mailto:braydonhorcoff@gmail.com)

- Braydon is our Fall intern. He is always eager to learn from our experienced staff and he contributes whenever possible.

## Goals

The goal of the first step in database development is to articulate a rigorous set of system requirements. Once requirements have been brainstormed and established we move on to developing the initial entity relationship model. We include drafts and notes developed in this stage at the end of the report.

## Requirements

Our requirements will be broken up into the entities we have decided are most important to include in the system. We did not necessarily come up with these in order but once the details and attributes were established we organized them into their respective entities.

### Users

There are two main subclasses of users in the system: students and teachers. Each type of user will enter the same required profile details upon creating an account. The primary key for identifying these accounts will be a unique derived attribute (derived from user ID). The two types of users can interact with one another through Skype or other video chat services. The main difference between a student and teacher type is that the student will submit worksheets while a teacher marks these submissions. See the E/R diagram on the next page for specific attributes and relations.

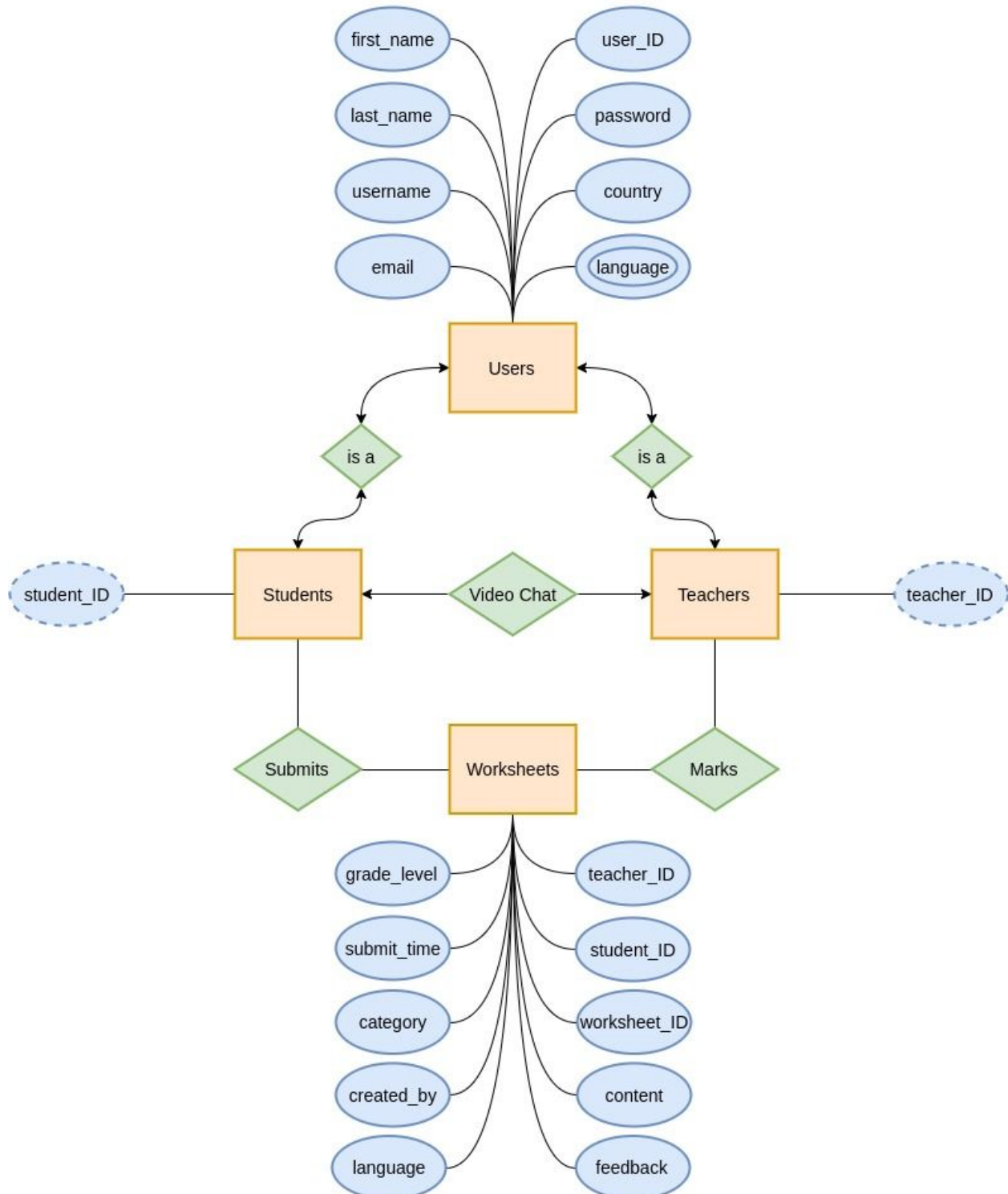
### Worksheets

Worksheet entities have interactions with both types of users. A student will have access to worksheets of various levels. Upon completion of the worksheet, the student will submit it for marking and the system will grant access to the group of teachers responsible for grading. The worksheets primary key will be a unique worksheet ID. If a student decides to submit a worksheet more than once for a better grade or extra practice, a fresh timestamp and ID will be given, as though it is completely new to the system. A student will have access to any marked worksheets as they can review their scores and feedback from a teacher.

### Overall System Requirements

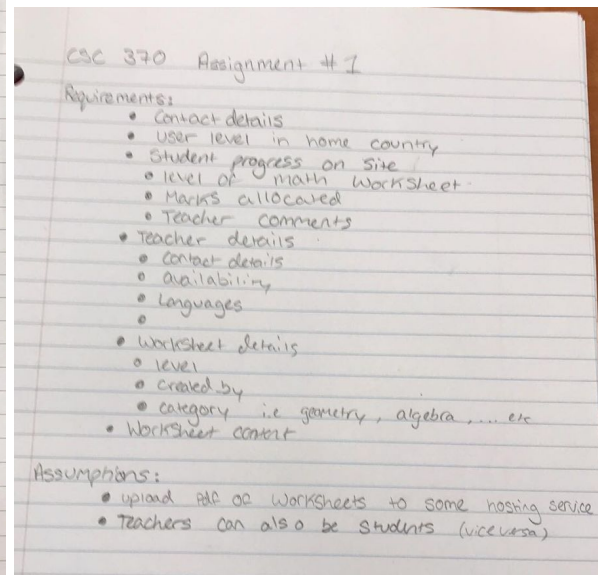
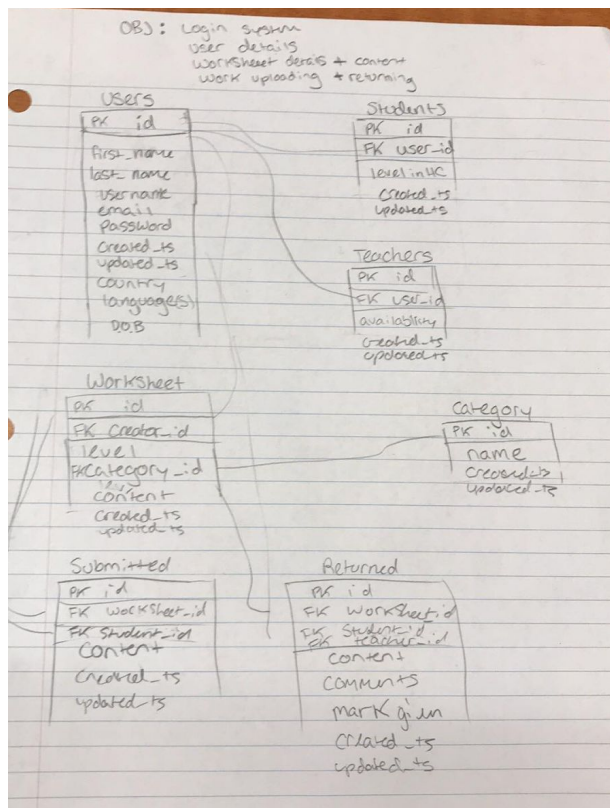
When developing this system we tried to create something simplistic and efficient. The main functionality is giving teachers and students easy access to the worksheets and each other. The most important part of the worksheet is the feedback provided by the teachers, which is only amplified by the ability to video chat with students and provide one on one tutoring. Aside from everything listed above some other functionality includes: downloading and printing worksheets, easy registration for teachers and students, easy uploading of completed worksheets and giving teachers access to worksheets to complete for themselves.

## Assignment #1: Entity-Relationship Diagram



## Notes

Here are the notes and rough drafts of diagrams and schema taken during our brainstorm sessions. We hope it offers insight into our thought process.



### Requirements:

- Contact details
- User level in home country
- Student progress on the site
  - Level of math worksheets
  - Marks allocated
  - Teacher comments
- Teacher details
  - Contact details
  - Availability
  - Languages
- Worksheet details
  - Level
  - Created by
  - Category



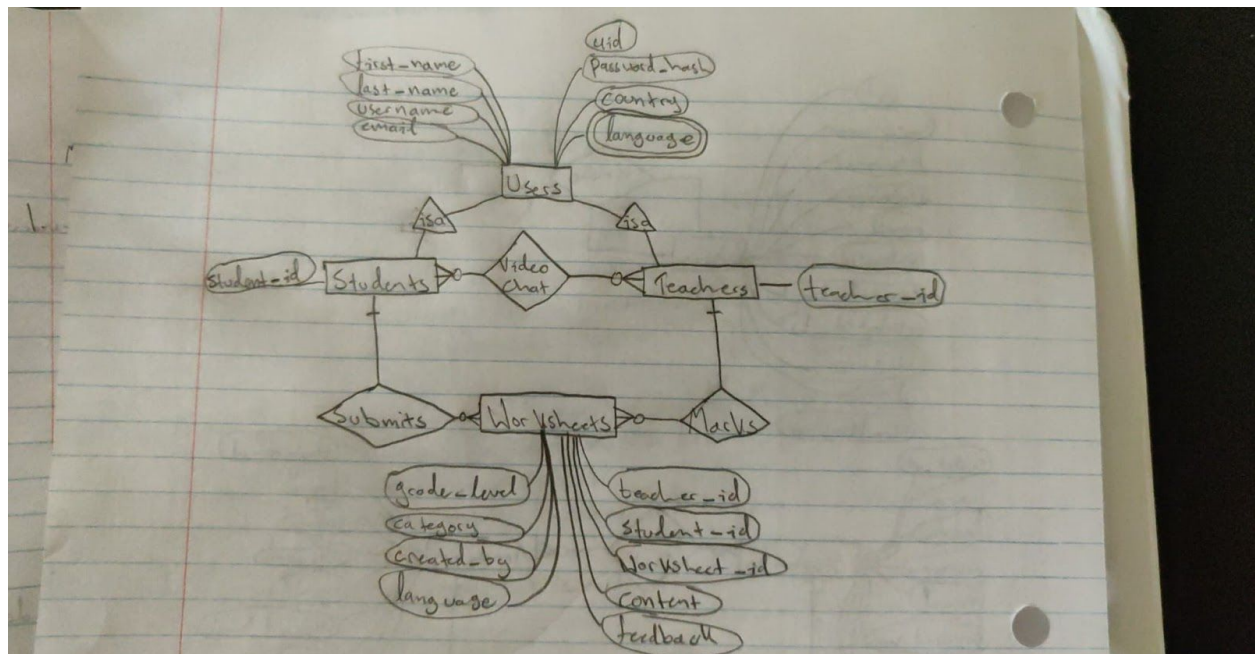
### Assumptions:

- Upload PDF of worksheets to a hosting service
- Teachers can also be students (And vice versa)
- Platform allows for video conferences between teachers and students

### Main objectives of the system:


- The system will help registered students (maybe even people not going to school) to become educated in all grade levels, including university/college.
- The system will allow anyone with internet access to study and learn math using worksheets, allowing users to receive feedback on their work to aid in their understanding

### Draft ER diagram



### Tasks performed by different users during a typical day:

- For students, the main tasks will relate to handling the worksheets provided to them by the teachers/system. They will also be provided with the resources to understand and submit their work. The tasks pertaining to students include:
  - Registration (new students)
    - Provide necessary information (ie. Full name, credit card/payment information, grade level to work in)
  - Downloading the worksheet
  - Working on the worksheet
  - Completing the worksheet

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- Using resources to help with work
  - Submitting the worksheet
  - Deciding whether to move to the next grade level, stay at the same grade level, or move down a grade level

For teachers, they will mainly provide the user with feedback and marking the worksheets submitted by students. Their tasks include:

- Registration (new teachers)
- Provide necessary information
- Downloading student-submitted worksheets
- Marking worksheets
- Giving grades and feedback for each submitted worksheet

*Data types associated with these tasks:*

For the website:

- PDF's
- JPEG's
- A skype profile

For the database:

- unsigned-Integers - Grades on papers
- String - Names of students, assignments and teachers

*Scope of the project and relevant data:*

For materials:

- Multiple worksheets for each grade level
- Recommended resources for extra help
- Marked worksheets with feedback

For users:

- Student information
- Teacher information
- Skype accounts

*Possible outputs with the given data:*

- Worksheets downloaded as a pdf file, then printed off
- Submitted work scanned/uploaded as a jpeg/pdf file.
- Student id after registration
- Submitted worksheets assigned to teachers to mark in a pdf format
- Feedback to be output as a text file or attached as a pdf to be returned with the marked worksheet