

RecruitMe

# CIS 560/562 Final Project

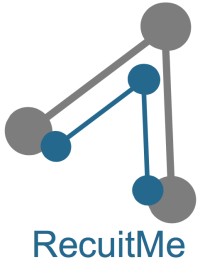
## **Created by:**

Christian Hughes

Zach Minton

Ryan Williams

Matt Hixon



# Introduction

RecruitMe is a powerful tool that allows university students and company recruiters to connect regarding vocational opportunities. Our web based interface provides a set of simple options that expedite the recruiting process. RecruitMe supports many universities, majors, and industries.

## **As a student:**

*RecruitMe will help you get hired by your dream company!*

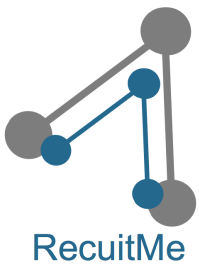
- Find companies that are recruiting from your specific major.
- Filter companies based on industry or salary range.
- Get quick access to recruiter contact information.
- View a list of peers that have worked for each company.

## **As a recruiter:**

*RecruitMe will help you find your dream candidate!*

- Find students from the specific majors that you're hiring from.
- Filter students based on GPA, graduation date, or university.
- Get quick access to student contact information and course history.
- View a list of the which companies (if any) each student worked at previously.

RecruitMe is targeted at University students seeking employment at all levels (internship, co-op, full-time). It's especially attractive to companies seeking to fill temporary or entry-level positions.



# Application Design

## High-Level Requirements & Design Criteria

---

*In designing RecruitMe, we set out to design an application that...*

- ...is **database driven**, utilizing best practice relational database design.
- ...is **web based** and easily accessible for a wide variety of users & devices.
- ...is **scaleable to many users** with mechanisms that ensure data integrity & consistency.
- ...is **modular** and allows for quick implementation of new features.
- ...is **intuitive to use** for users at all technical levels.

## Technical Description

---

*RecruitMe is a full stack web application; therefore, we utilized a wide breadth of technologies:*

### Database:

*The database is the central information repository for students, recruiters, and companies. See the “Database Design” (p.3-4) and “Database Implementation” (p.5-6) for specific design considerations.*

- The database was created and populated using **MySQL** (mysql.com). MySQL is a widely used open-source relational database solution.
- Database interfacing and administration was done using **PHPMyAdmin** (phpmyadmin.net). PHPMyAdmin provides a graphical web interface for MySQL database management.
- Simulated production data was generated using **generatedata.com**. Data entry was expedited with **Python** (python.org) scripting.

## Back-End (Server-Side):

*The back-end technologies provide a link between the RecruitMe web interface and the database. It dynamically populates each web page with specific data requested by the user.*

- The server-side code is written in **Python** (python.org) using the **Flask Web Framework** (flask.pocoo.org). Flask provides a suite of useful tools and functions for dynamically populating web pages.
- The **Flask-MySQL** (flask-mysql.readthedocs.io) Flask plug-in provides integrated database querying functionality.

## Front-End (Client-Side):

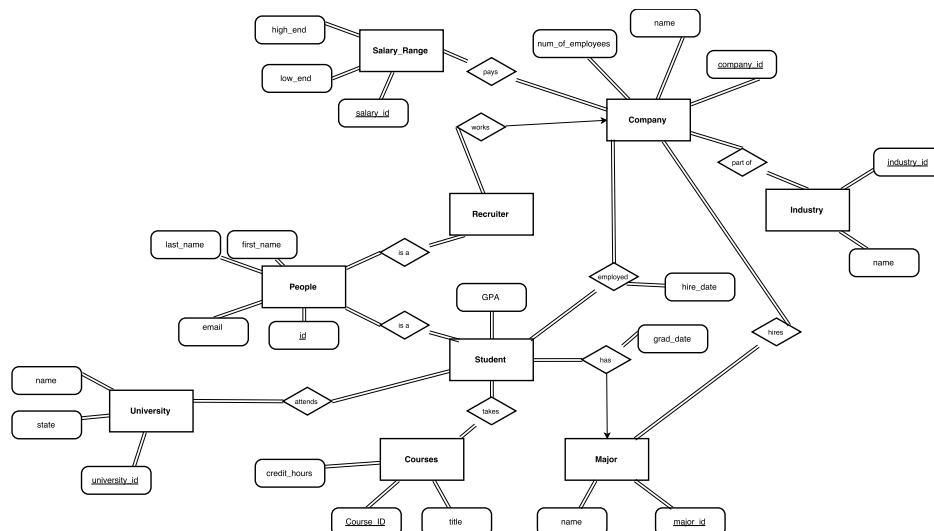
*The front-end technologies build and render the RecruitMe web interface.*

- The **Bootstrap Web Framework** (getbootstrap.com) was used to build the GUI, and serves as a useful extension for **HTML/CSS** (w3.org/standards/webdesign/htmlcss). Bootstrap has a suite of customizable UI elements optimized for responsive web design (compatibility across different device types).
- **jQuery** (jquery.com) and **JavaScript** (javascript.com) drive all of the client-side web page logic.

## Database Design

---

### Entity Relationship Diagram:



## Database Schema:

**People**(ID, first\_name, last\_name, email)

**Student**(student\_ID, major\_ID, university\_ID, GPA, grad\_date)  
student\_id is a foreign key referencing ID in People  
major\_ID is a foreign key referencing major\_ID in Major  
university\_ID is a foreign key referencing university\_ID in University

**Recruiter**(recruiter\_ID, company\_ID)  
recruiter\_ID is a foreign key referencing ID in People  
company\_ID is a foreign key referencing company\_ID in Company

**University**(university\_ID, name, state)

**Company**(company\_ID, salary\_ID, name, num\_of\_employees)  
salary\_ID is a foreign key referencing salary\_ID in Salary\_Range

**Industry**(industry\_ID, name)

**Major**(major\_ID, name)

**Course**(course\_ID, title, credit\_hours)

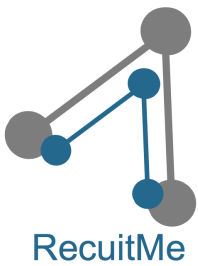
**Salary\_Range**(salary\_ID, low\_end, high\_end)

**Student\_Course**(student\_ID, course\_ID)  
student\_ID is a foreign key referencing student\_ID in Student  
course\_ID is a foreign key referencing course\_ID in Courses

**Company\_Majors**(company\_ID, major\_ID)  
company\_ID is a foreign key referencing company\_ID in Company  
major\_ID is a foreign key referencing major\_ID in Major

**Company\_Industry**(company\_ID, industry\_ID)  
company\_ID is a foreign key referencing company\_ID in Company  
industry\_ID is a foreign key referencing industry\_ID in Industry

**Student\_Company**(student\_ID, company\_ID, hire\_date)  
student\_ID is a foreign key referencing student\_ID in Student  
company\_ID is a foreign key referencing company\_ID in Company



# Application Implementation

## Database Implementation

---

### Table Creation:

The MySQL statements used to create each table (and their associated constraints) are provided alongside this report in the **table.sql** file. The tables are identical to those listed in the “Database Schema” section (p.4).

### Data Generation:

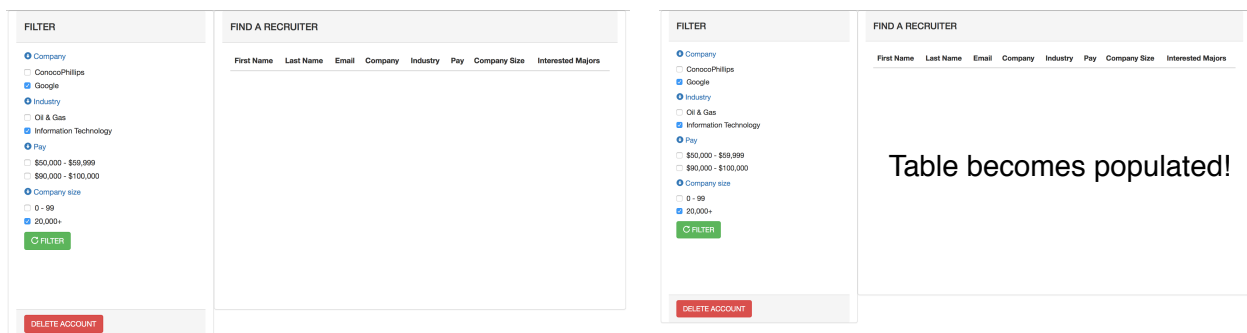
The simulated production data provided by generatedata.com was uploaded to PHPMysqlAdmin in the CSV data format. PHPMysqlAdmin converted the CSV files into the following SQL scripts (provided alongside this report):

Script File Name	Affected Table	Number of Rows
company_data.sql	Company	10
company_industry_data.sql	Company_Industry	10
company_majors_data.sql	Company_Majors	20
course_data.sql	Course	20
industry_data.sql	Industry	10
major_data.sql	Major	10
people_data.sql	People	1000
recruiter_data.sql	Recruiter	10
salary_range_data.sql	Salary_Range	10
student_company_data.sql	Student_Company	800
student_course_data.sql	Student_Course	3914
student_data.sql	Student	990
university_data.sql	University	10

## Data Generation (Continued):

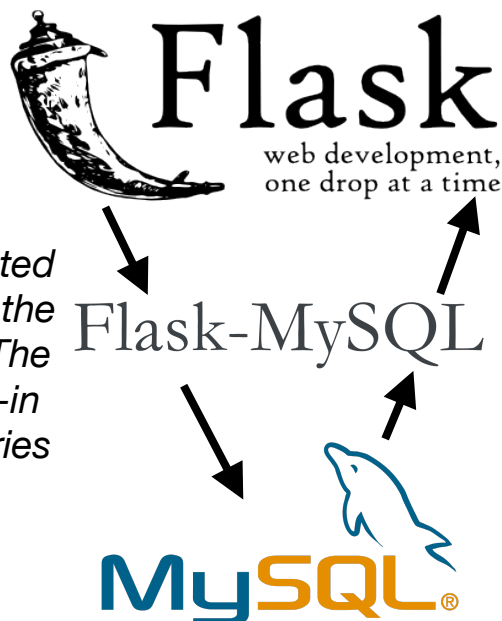
Data generation for the *Student\_Course* table was given special consideration — we sought to ensure that sample students were assigned courses pertinent to their major (instead of being assigned courses at random). The python script responsible for this is provided alongside this report in the **student\_course.py** file.

## System Implementation



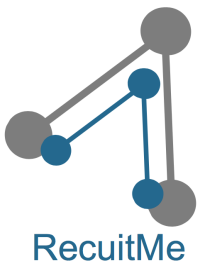
1. The user selects the filters that they would like to apply to the list of available candidates.

2. Queries are dynamically generated based on filters via the Flask Framework. The Flask MySQL plug-in submits these queries to the MySQL database.



4. The query results are parsed, and displayed on the web page!

3. MySQL returns the query results back to the Flask-MySQL plug-in. They are transformed into objects readable by the Flask Framework.



# Application Features & Usage

## Student Usage Scenario

*Upon signing up and logging in (see “Application Interface” p.8), students are able to find recruiters and companies based on which filters that they select.*

**FILTER**

- ☒ Company
  - Augie Porttitor Interdum Corp.
  - Posuere Vulputate Lacus PC
  - Suspendisse Non LLC
- ☒ Industry
  - Education
  - Financial Services
  - Utilities
- ☒ Pay
  - \$5,000+
  - \$6000+
  - \$7000+

**FIND A RECRUITER**

- uWade Luke ac.nulla.in@eratvolutpat.ca | Augue orttitor nterdum orp. | Telecommunications | \$ 1000 - 1999 | 38300 | Education
- Bernard Signe hendrent.consectetur.cursus@odioauctorvitae.org | Erat emper LP | Financial services | \$ 1000 - 1999 | 46358 | Statistics
- Curran Adele Phasellus.nulla.Integer@dulin.ca | Posuere ulputate acus C | Insurance | \$ 8000 - 8999 | 4339 | Accounting
- Maxine Jasper dictum@nibh.net | Nunc auris orp. | Financial services | \$ 6000 - 6999 | 46188 | Statistics
- Carlos Steel interdum.Sed@etmagnisdis.org | Aliquet orp. | Financial services | \$ 0 - 999 | 30435 | Statistics
- t rec3 trec | Aliquet orp. | Financial services | \$ 0 - 999 | 30435 | Statistics
- t rec trec3 | Aliquet orp. | Financial services | \$ 0 - 999 | 30435 | Statistics
- Hollie Kirk adipiscing.ellit@a.edu | Suspendisse leiffend id | Insurance | \$ 6000 - 6999 | 15465 | Accounting
- Halla Rafael in.hendrent@eu.ca | Mollis LC | Financial services | \$ 7000 - 7999 | 32354 | Statistics
- Alexander Walter tortor@vestibulumneceusmod.edu | Egestas LP | Telecommunications | \$ 3000 - 3999 | 22556 | Education
- Macaulay Melinda luctus.ut@dictumtriciesligula.net | Suspendisse on LC | Financial services | \$ 9000 - + | 11483 | Statistics

## Recruiter Usage Scenario

*Upon signing up and logging in (see “Application Interface” p.8), recruiters are able to find potential candidates (students) based on which filters that they select.*

**FILTER**

- ☒ Major
  - Accounting
  - Computer Science
- ☒ GPA
  - 2.00 - 2.99
  - 3.00 - 3.99
  - 4.00+
- ☒ College
  - Kansas State University
  - Oklahoma State University

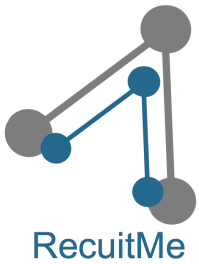
**FIND A CANDIDATE**

- uFullton Hanse sem.mollis.dul@moiestearcu.ca | Computer science | University f rkansas | 2.85
- Signe Sybill neque@CrainterdumNunc.org | Computer science | Oklahoma tate niversity | 3.1
- Imani Cors enim@ggettacusMauris.org | Computer science | University f rkansas | 2.85
- MacKensie Kane velit.eu@necante.com | Computer science | Kansas tate niversity | 3.1
- Kennan Magee sed.orci.lobortis@elit.edu | Computer science | Wichita tate niversity | 2.0
- Aidan Lane eget.venenatis.a@primisln.org | Computer science | University f rkansas | 3.15
- Ivory Marny dolor.Donec@egestas.org | Computer science | Wichita tate niversity | 1.75
- Camden Eaton ut@Nuncmauris.net | Computer science | Yale niversity | 3.1
- Macy Grady malesuada.id.erat@elementumloremut.com | Computer science | University f ulsa | 3.0
- Kay Leah a@egestasblandit.edu | Computer science | Texas &M niversity | 3.15
- Paul Hayes tempor.bibendum@tempor.co.uk | Computer science | University f exas | 4.0
- Camilla Jerry Donec.felis@dictum.com | Computer science | Texas &M niversity | 1.5
- Warren Hayden id@inaliquetobortis.com | Computer science | Yale niversity | 2.25
- Chester Russell Mauris.magna@est.co.uk | Computer science | University f rkansas | 1.5
- Genevieve Germane pede.et@ornare.net | Computer science | Kansas tate niversity | 2.95
- Garrett Keaton Donec@faucibus.edu | Computer science | Wichita tate niversity | 3.1

## Queries and Reports

*RecruitMe is capable of generating many different queries — these queries are tailored based on the specific filters that the user selects in the web interface. We’ve included some especially interesting queries alongside this report in the **RecruitMe\_Sample\_Queries.pdf** file. This file also contains a description of each query, and a screenshot of the resulting output.*





# Application Interface



## RecruitMe

Connecting K-State students to their dream jobs since 2016®

I am a...

Student

Recruiter

### Student Login

**Student ID:**

**Password:**

**LOGIN**

### Recruiter Login

**Email:**

**Password:**

**LOGIN**

...as a student...

**First Name:**

**Last Name:**

**Email:**

**Password:**

**Confirm Password:**

**Student ID:**

**GPA:**

**Major:**

**Find your dream job!**

...as a student...

### FILTER

**Company**

- Augue Portitor Interdum Corp.
- Posuere Vulputate Lacus PC
- Suspendisse Non LLC

**Industry**

- Education
- Financial Services
- Utilities

**Pay**

- \$5,000+
- \$6000+
- \$7000+

**DELETE ACCOUNT**

### FIND A RECRUITER

- uWade Luke ac.nulla.in@eratvoluptat.ca | Augue ortitor interdum corp. | Telecommunications | \$ 1000 - 1999 | 38300 | Education
- Bernard Signe hendrerit.consectetur.cursus@odioauctorvitae.org | Erat emper LP | Financial services | \$ 1000 - 1999 | 46358 | Statistics
- Curran Adele Phasellus.nulla.integer@dulin.ca | Posuere vulputate acus C | Insurance | \$ 8000 - 8999 | 4339 | Accounting
- Maxine Jasper dictum@nibh.net | Nunc auris orp. | Financial services | \$ 5000 - 5999 | 46188 | Statistics
- Carlos Steel interdum.Sed@etmagnisis.org | Aliquet orp. | Financial services | \$ 0 - 999 | 30435 | Statistics
- t rec3 trec | Aliquet orp. | Financial services | \$ 0 - 999 | 30435 | Statistics
- t rec trec3 | Aliquet orp. | Financial services | \$ 0 - 999 | 35435 | Statistics
- Hollie Kirk adipiscing.ellit@a.edu | Suspendisse lilehend id | Insurance | \$ 6000 - 6999 | 15465 | Accounting
- Halla Rafael in.hendrerit@au.ca | Mollis LC | Financial services | \$ 7000 - 7999 | 32354 | Statistics
- Alexander Walter tortor@vestibulumneceusmod.edu | Egestas LP | Telecommunications | \$ 3000 - 3999 | 22556 | Education
- Maculay Melinda luctus.ut@dictumultricesligula.net | Suspendisse on LC | Financial services | \$ 9000 - + | 11483 | Statistics

...or as a recruiter.

**First Name:**

**Last Name:**

**Email:**

**Password:**

**Confirm Password:**

**Company:**

**Desired Majors (separate by comma):**

**Find job candidates!**

...or as a recruiter.

### FILTER

**Major**

- Accounting
- Computer Science

**GPA**

- 2.00 - 2.99
- 3.00 - 3.99
- 4.00+

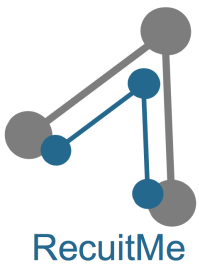
**College**

- Kansas State University
- Oklahoma State University

**DELETE ACCOUNT**

### FIND A CANDIDATE

- uFulton Hanase sem.mollis.dui@molestiaerccu.ca | Computer science | University f rkansas | 2.85
- Signe Sybil neque@CrasinterdumNunc.org | Computer science | Oklahoma tate niversity | 3.1
- Imael Cora erim@egestasusMauris.org | Computer science | University f rkansas | 2.85
- MacKensie Kane velit.eu@necante.com | Computer science | Kansas tate niversity | 3.1
- Kennan Magee sed.orci.lobortis@elit.edu | Computer science | Wichita tate niversity | 2.0
- Aiden Lane eget.venenatis.a@primisn.org | Computer science | University f rkansas | 3.15
- Ivory Marny dolor.Donec@egestas.org | Computer science | Wichita tate niversity | 1.75
- Camden Eaton ut@Nuncmauris.net | Computer science | Yale niversity | 3.1
- Macy Grady malesuada.id.erat@elementumloremut.com | Computer science | University f usa | 3.0
- Kay Leah a@egestasblandit.edu | Computer science | Texas &M niversity | 3.15
- Paul Hayes tempor.bibendum@tempor.co.uk | Computer science | University f exas | 4.0
- Camilla Jerry Donec.felis@dictum.com | Computer science | Texas &M niversity | 1.5
- Warren Hayden id@niquetibortis.com | Computer science | Yale niversity | 2.25
- Chester Russell Mauris.magna@est.co.uk | Computer science | University f rkansas | 1.5
- Genevieve Germane pede.et@ornare.net | Computer science | Kansas tate niversity | 2.95
- Garrett Keaton Donec@faucibus.edu | Computer science | Wichita tate niversity | 3.1



# Summary & Reflection

## Application Evaluation

---

*We evaluated RecruitMe on the following:*

- **Does it function as intended?** Our team worked diligently to ensure the accuracy of query results (incorrect query results would be especially damaging for this application). The application remains stable (crash-free) across all tested use cases.
- **Is it responsive?** As a web application, the responsiveness of RecruitMe is largely based on the load time for each page. With our current data set, all pages either load instantly or within a few seconds.
- **Is it Intuitive?** We strove to build an uncluttered and easy to navigate user interface. Bootstrap provides a suite of intuitive user interface elements — we're confident that any user familiar with web page navigation can use RecruitMe without instruction.

## Reflection Questions

---

### **Did our Final implementation meet the original design requirements?**

*Our final implementation follows the original design requirements exactly. We didn't add any additional tables or features throughout the development process.*

### **What did we learn? What would we change?**

*We developed proficiency with MySQL, data generation, web interface development, and real-world database interaction scenarios. The whole team got exposure to the technologies listed in the "Technical Description" section (p.2-3). If starting the development process over again, we would have made more of an effort to have a unified development environment; some early bugs were the result of having an incongruent set of tools/plug-ins across team members.*

## What sorts of improvements could be implemented in the future?

*The current implementation of RecruitMe is only the beginning! The following features could be added given more development time:*

- A fully implemented password authentication system (the UI element exists, but the logic does not).
- The ability for recruiters to optionally hide their contact information.
- A more customizable filter system, with the ability to export query results as CSV files (for use in other applications).

## Team Work Experience

---

*Each member of our team specialized on a different aspect of the project. **Matt** created the database tables, generated sample data, and wrote our queries. **Ryan** established and initialized the various web frameworks, bridged connections between the application and the database, wrote application logic and created the user interface. **Christian** established requirements, and authored the Final Report. **Zach** worked on the final presentation.*