CSI 3450 – Database Design & Implementation
Final Project Report
Group: Mandalorians

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Temporary Employment Corporation (TEC)

Abstract

The goal of the Temporary Employment Corporation (hereby referred to as the *TEC*) is to provide a service to both employers and individuals who are currently looking for temporary employment opportunities in various fields by managing a variety of facets that assist both parties in achieving their goals. The TEC has the ability to view and manage prospective employees that are seeking temporary work, the employment history of candidates (including qualifications, certificates, and previous training), and personal information pertaining to the candidates. The company also provides paid training courses for candidates, as well as some which require pre-existing qualifications. Employers are able to use the TEC to more accurately search for appropriate temporary hires that best match their job's specifications, making the TEC a valuable tool for both employers seeking short-term workers, and individuals who are searching for a job that does not require a long-term commitment, but also utilizes their skills appropriately and pays a more enticing salary.

Attributes & Entities

CANDIDATE

candidate_id ***integer, PK***
candidate_fname ***varchar***
candidate_lname ***varchar***
candidate_phone ***char***
candidate_email ***varchar***
candidate_addr ***varchar***

QUALIFICATION

qual_code ***varchar, PK***
qual_desc ***varchar***

CANDIDATE_QUALIFICATIONS

candidate_id ***integer, FK***
qual_code ***varchar, FK***

JOB_HISTORY

job_history_id ***integer, PK***
candidate_id ***integer, FK***
placement_id ***integer, FK***
start_dt ***date***
end_dt ***date***
total_hours ***integer***

COMPANY

company_id ***integer, PK***
company_name ***varchar***
company_addr ***varchar***
company_phone ***char***
company_email ***varchar***

OPENING

opening_id ***integer, PK***
company_id ***integer, FK***
num_of_positions ***integer***
start_dt ***date***

end_dt ***date***
hourly_pay ***integer***

PLACEMENT
placement_id ***integer, PK***
opening_id ***integer, FK***
candidate_id ***integer, FK***
total_hours ***integer***

OPENING_QUALIFICATIONS
opening_id ***integer***
qual_code ***varchar, FK***

COURSE
course_id ***integer, PK***
course_name ***varchar***
qual_code ***varchar, FK***

SESSION
course_id ***integer, FK***
course_name ***varchar***
qual_code ***varchar, FK***
start_time ***datetime***
end_time ***datetime***
session_fee ***number***

SESSION_CANDIDATES
candidate_id ***integer, FK***
session_id ***integer, FK***

COURSE_PREREQS
course_id ***integer, FK***
qual_code ***varchar, FK***

Business Rules

- A CANDIDATE may have zero or more JOB_HISTORIES entries
  A specific JOB_HISTORY belongs to one CANDIDATE
- One CANDIDATE can have several QUALIFICATIONS
  One QUALIFICATION can be earned by multiple CANDIDATES
- A CANDIDATE can take COURSES to earn QUALIFICATIONS
  A QUALIFICATION can be earned through a COURSE
- A COURSE belongs to one specific QUALIFICATION
  A QUALIFICATION may or may not have an associated COURSE available
  A QUALIFICATION may need more than one COURSE to be earned
- A COURSE may have one or more prerequisite QUALIFICATIONS
  A QUALIFICATION may be a prerequisite for one or more COURSES
- A COURSE can have zero or more associated training SESSIONS
  A training SESSION teaches one COURSE
  A COURSE is taught through one training SESSION
- A training SESSION can be attended by zero or more CANDIDATES
  A CANDIDATE can attend many training SESSIONS
- A COMPANY can request many CANDIDATES
  A CANDIDATE can be requested by many COMPANIES
- A COMPANY can create OPENINGS
  An OPENING is belongs to one COMPANY
- An OPENING has one or more required QUALIFICATIONS
  A QUALIFICATION may be required by an OPENING
- An OPENING can be filled by many CANDIDATES
  A CANDIDATE can fill many OPENINGS

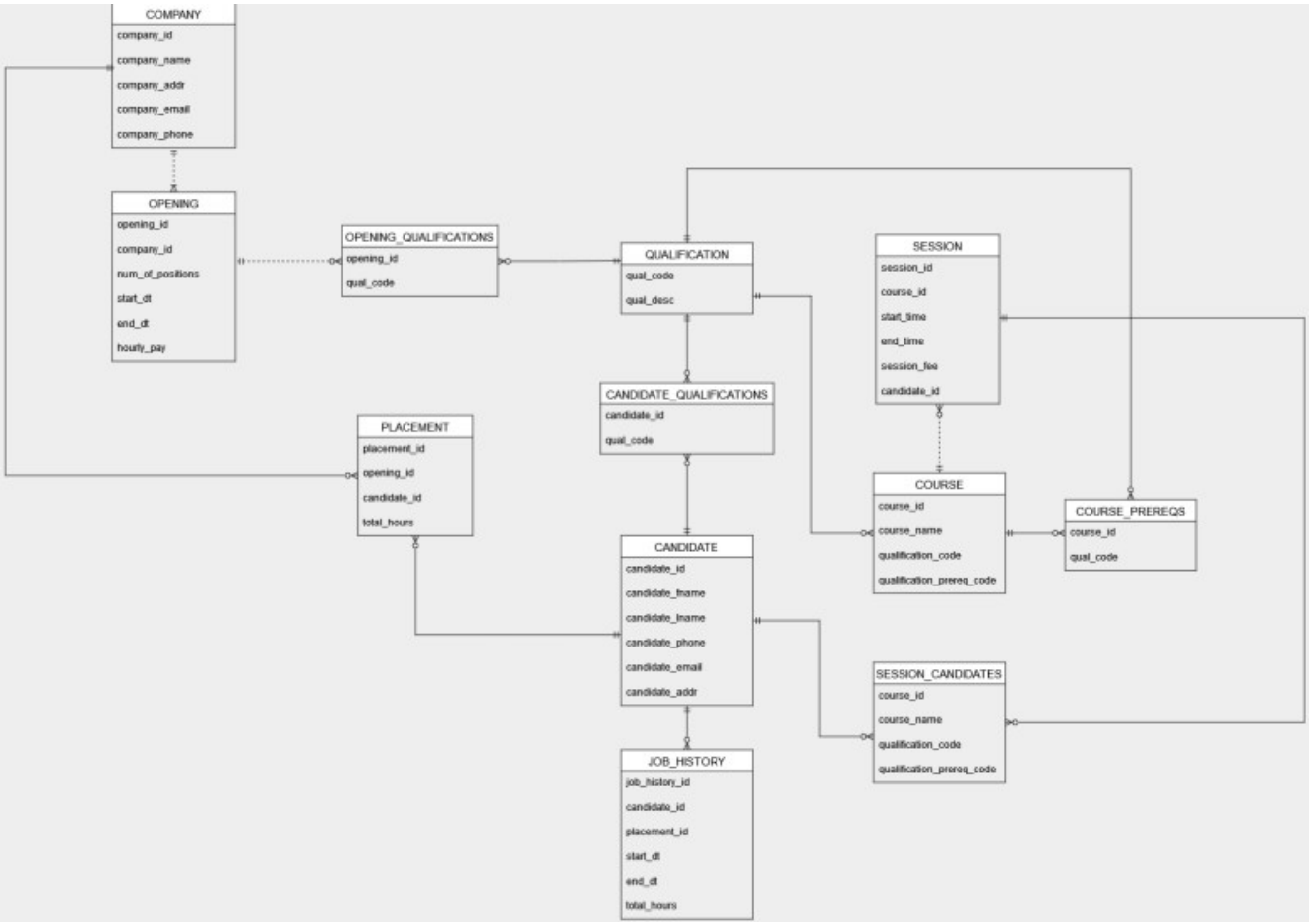
Data Dictionary

Table Name	Attribute Name	Contents	Type	Format	Range	Required	PK / FK	FK Referenced Table
CANDIDATE	candidate_id	Candidate id number	INTEGER	999	1-99,999,999,999	Y	PK	
	candidate_fname	Candidate first name	VARCHAR(20)	Xxxxxxxx		Y		
	candidate_lname	Candidate last name	VARCHAR(20)	Xxxxxxxx		N		
	candidate_phone	Candidate phone number	CHAR(11)	999-999-9999		N		
	candidate_email	Candidate email	VARCHAR(50)	xxxx@xxxx.xxx		N		
	candidate_addr	Candidate home address	VARCHAR(100)	Xxxxxxxx		N		
QUALIFICATION	qual_code	Qualification code	VARCHAR(15)	Xxxxxxxx		Y	PK	
	qual_desc	Qualification description	VARCHAR(75)	Xxxxxxxx		Y		
CANDIDATE_ QUALIFICATIONS	candidate_id	Candidate id number	INTEGER	999	1-99,999,999,999	Y	PK FK_1	CANDIDATE
	qual_code	Qualification code	VARCHAR(15)	Xxxxxxxx		Y	PK FK_2	QUALIFICATION
JOB_HISTORY	job_history_id	Job history entry id number	INTEGER	999	1-99,999,999,999	Y	PK	
	candidate_id	Candidate id number	INTEGER	999	1-99,999,999,999	Y	FK_1	CANDIDATE
	placement_id	Placement id number	INTEGER	999	1-99,999,999,999	N	FK_2	PLACEMENT
	start_dt	Job start date	DATE	yyyy-mm-dd		Y		
	end_dt	Job end date	DATE	yyyy-mm-dd		Y		
	total_hours	Total number of hours worked for that job	INTEGER	999	1-99,999,999,999	N		
COMPANY	company_id	Company id number	INTEGER	999	1-99,999,999,999	Y	PK	
	company_name	Company name	VARCHAR(50)	Xxxxxxxx		Y		
	company_addr	Company headquarters address	VARCHAR(100)	Xxxxxxxx		N		
	company_phone	Company phone number	CHAR(11)	999-999-9999		N		
	company_email	Company email	VARCHAR(50)	xxxx@xxxx.xxx		N		

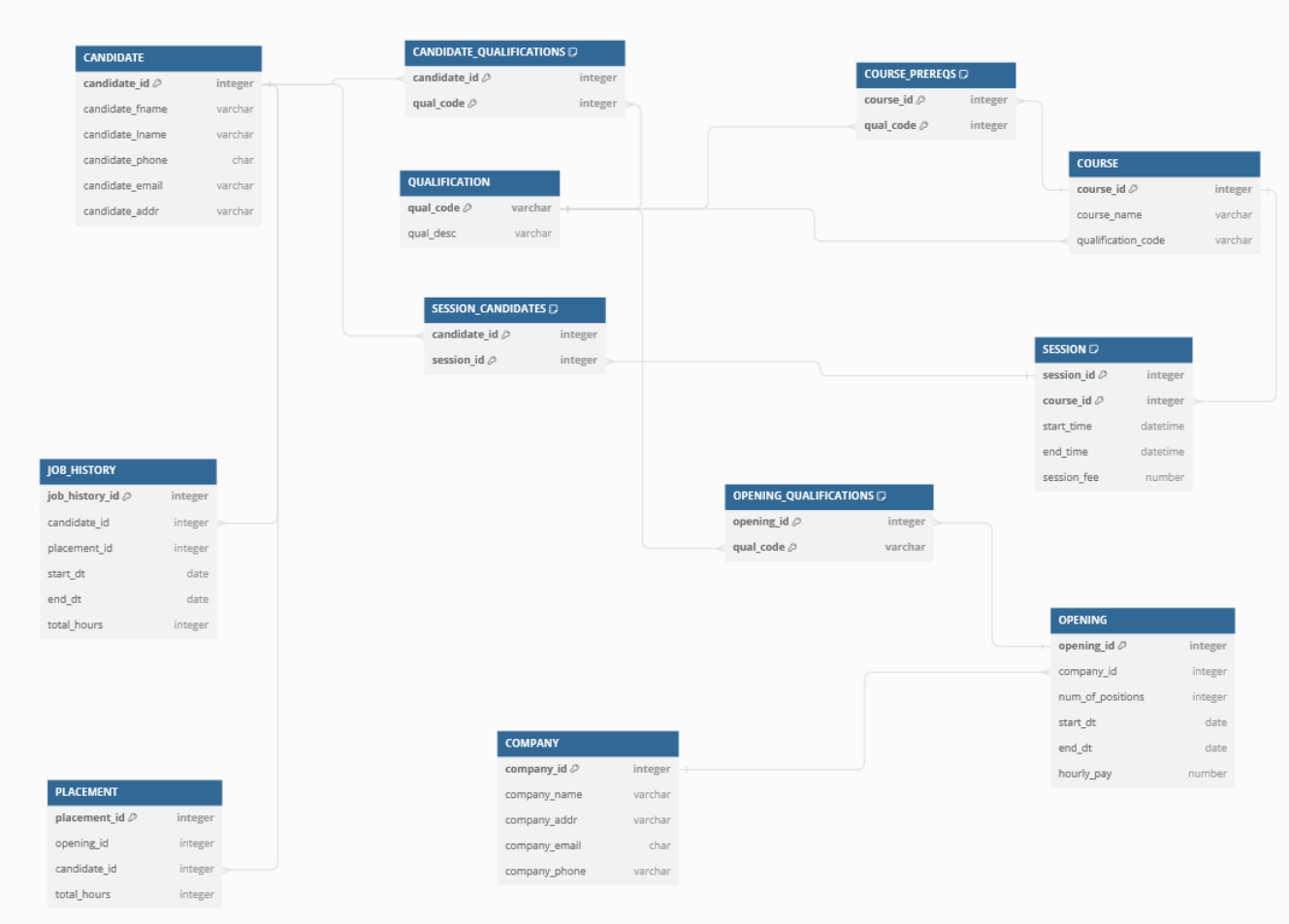
Table Name	Attribute Name	Contents	Type	Format	Range	Required	PK / FK	FK Referenced Table
OPENING	opening_id	Job opening id number	INTEGER	999	1-99,999,999,999	Y	PK	
	company_id	Company id number that is creating job opening	INTEGER	999	1-99,999,999,999	Y	FK	COMPANY
	num_of_positions	Number of positions offered for that particular job opening	INTEGER	999	1-99,999,999,999	Y		
	start_dt	Opening start date	DATE	yyyy-mm-dd		Y		
	end_dt	Projected opening end date	DATE	yyyy-mm-dd		N		
	hourly_pay	Hourly pay offered for job opening	NUMBER(3,2)	999.99	0-999.99	Y		
PLACEMENT	placement_id	Placement id number	INTEGER	999	1-99,999,999,999	Y	PK	
	opening_id	Job opening id number	INTEGER	999	1-99,999,999,999	Y	FK_1	OPENING
	candidate_id	Candidate id number	INTEGER	999	1-99,999,999,999	Y	FK_2	CANDIDATE
	total_hours	Total hours worked at that job by candidate	NUMBER(9,2)	9999.99		Y		
OPENING_ QUALIFICATIONS	opening_id	Job opening id number	INTEGER	999	1-99,999,999,999	Y	PK FK_1	OPENING
	qual_code	Qualification code	VARCHAR(15)	Xxxxxxxx		Y	PK FK_2	QUALIFICATION
COURSE	course_id	Course id number	INTEGER	999	1-99,999,999,999	Y	PK	
	course_name	Course name	VARCHAR(100)	Xxxxxxxx		Y		
	qual_code	Qualification code	VARCHAR(15)	Xxxxxxxx		Y	FK	QUALIFICATION
SESSION	session_id	Session id number	INTEGER	999	1-99,999,999,999	Y	PK	
	course_id	Course id number	INTEGER	999	1-99,999,999,999	Y	FK	COURSE
	start_time	Session start time	DATETIME	yyyy-MM-dd hh:mm		Y		
	end_time	Session end time	DATETIME	yyyy-MM-dd hh:mm		Y		
	session_fee	Session fee to attend paid by each candidate	NUMBER(9,2)	999.99		Y		

Table Name	Attribute Name	Contents	Type	Format	Range	Required	PK / FK	FK Referenced Table
SESSION_ CANDIDATES	session_id	Session id number	INTEGER	999	1-99,999,999,999	Y	PK, FK_1	SESSION
	candidate_id	Candidate id number	INTEGER	999	1-99,999,999,999	Y	PK, FK_2	CANDIDATE
COURSE_ PREREQS	course_id	Course id number	INTEGER	999	1-99,999,999,999	Y	PK, FK_1	COURSE
	qual_code	Qualification code	VARCHAR(15)	Xxxxxxxx		Y	PK, FK_2	QUALIFICATION

Entity Relationship Model



Relational Diagram



Relationships

Entity 1	Relationship	——→	←——	Entity 2	Connective Attribute
CANDIDATE	|–o{	Optional 1:N	1:1	JOB_HISTORY	Candidate_id
COMPANY	|--o{	Optional 1:N	1:1	OPENING	Company_id
COMPANY	|–o{	Optional 1:N		PLACEMENT	Company_id
PLACEMENT	}o–|			CANDIDATE	Candidate_id
CANDIDATE	|–o{			CANDIDATE_ QUALIFICATIONS	Candidate_id
CANDIDATE_ QUALIFICATIONS	}o–|			QUALIFICATION	Qual_code
COURSE	}o–|	Optional 1:1	1:N	QUALIFICATION	Qual_code
COURSE	|–o{	Optional 1:N		COURSE_PREREQS	qual_prereq
COURSE_ PPREREQS	}o–|		Optional 1:N	QUALIFICATION	qual_prereq
COURSE	|--o{	Optional 1:N	1:1	SESSION	course_id
CANDIDATE	|–o{	Optional 1:N		SESSION_ CANDIDATES	candidate_id
SESSION_ CANDIDATES	}o–|			SESSION	session_id
OPENING	|--o{			OPENING_ QUALIFICATIONS	opening_id
OPENING_ QUALIFICATIONS	}o–|		Optional 1:N	QUALIFICATION	qual_id

SQL Queries

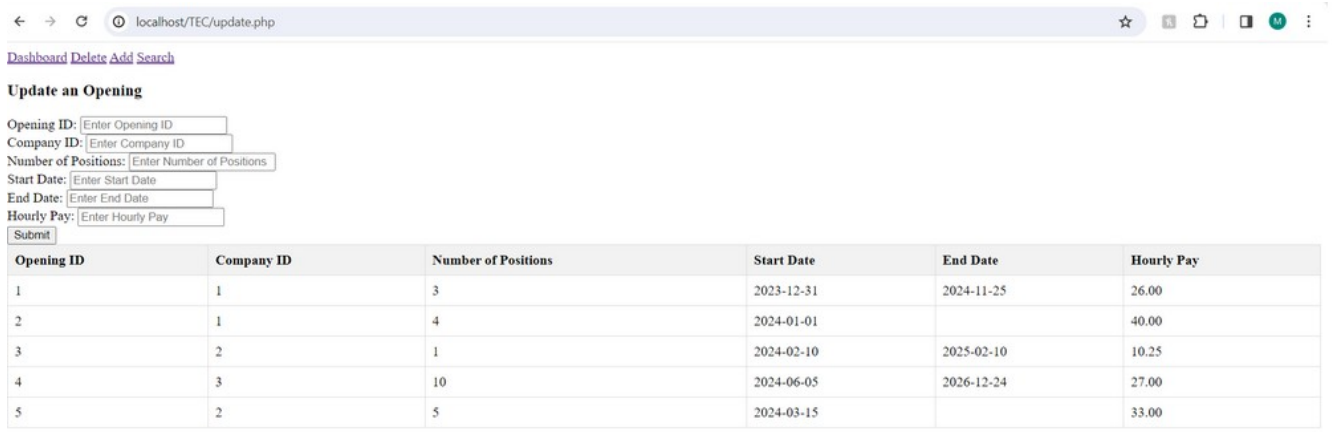
```
CREATE TABLE CANDIDATE (
    candidate_id INTEGER PRIMARY KEY,
    candidate_fname VARCHAR(20) NOT NULL,
    candidate_lname VARCHAR(20),
    candidate_phone CHAR(11),
    candidate_email VARCHAR(50),
    candidate_addr VARCHAR(100)
);

CREATE TABLE QUALIFICATION (
    qual_code VARCHAR(15) PRIMARY KEY,
    qual_desc VARCHAR(75) NOT NULL
);

CREATE TABLE CANDIDATE_QUALIFICATIONS (
    candidate_id INTEGER,
    qual_code VARCHAR(15),
    PRIMARY KEY (candidate_id, qual_code),
    FOREIGN KEY (candidate_id) REFERENCES CANDIDATE(candidate_id),
    FOREIGN KEY (qual_code) REFERENCES QUALIFICATION(qual_code)
```

```
);

CREATE TABLE JOB_HISTORY (
   job_history_id INTEGER PRIMARY KEY,
   candidate_id INTEGER,
   placement_id INTEGER,
   start_dt DATE,
   end_dt DATE,
   total_hours INTEGER,
   FOREIGN KEY (candidate_id) REFERENCES CANDIDATE(candidate_id),
   FOREIGN KEY (placement_id) REFERENCES PLACEMENT(placement_id)
);

CREATE TABLE COMPANY (
   company_id INTEGER PRIMARY KEY,
   company_name VARCHAR(50) NOT NULL,
   company_addr VARCHAR(100),
   company_phone CHAR(11),
   company_email VARCHAR(50)
);

CREATE TABLE OPENING (
   opening_id INTEGER PRIMARY KEY,
   company_id INTEGER,
   num_of_positions INTEGER,
   start_dt DATE,
   end_dt DATE,
   hourly_pay NUMBER(3,2),
   FOREIGN KEY (company_id) REFERENCES COMPANY(company_id)
);

CREATE TABLE PLACEMENT (
   placement_id INTEGER PRIMARY KEY,
   opening_id INTEGER,
   candidate_id INTEGER,
   total_hours NUMBER(9,2),
   FOREIGN KEY (opening_id) REFERENCES OPENING(opening_id),
   FOREIGN KEY (candidate_id) REFERENCES CANDIDATE(candidate_id)
);

CREATE TABLE OPENING_QUALIFICATIONS (
   opening_id INTEGER,
   qual_code VARCHAR(15),
   PRIMARY KEY (opening_id, qual_code),
   FOREIGN KEY (opening_id) REFERENCES OPENING(opening_id),
   FOREIGN KEY (qual_code) REFERENCES QUALIFICATION(qual_code)
);
```

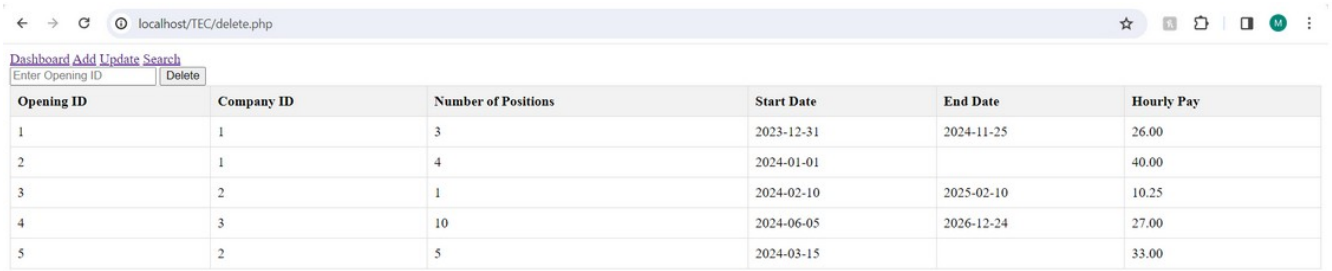
```
CREATE TABLE COURSE (
    course_id INTEGER PRIMARY KEY,
    course_name VARCHAR(100) NOT NULL,
    qual_code VARCHAR(15),
    FOREIGN KEY (qual_code) REFERENCES QUALIFICATION(qual_code)
);

CREATE TABLE SESSION (
    session_id INTEGER PRIMARY KEY,
    course_id INTEGER,
    start_time DATETIME,
    end_time DATETIME,
    session_fee NUMBER(9,2),
    FOREIGN KEY (course_id) REFERENCES COURSE(course_id)
);

CREATE TABLE SESSION_CANDIDATES (
    session_id INTEGER,
    candidate_id INTEGER,
    PRIMARY KEY (session_id, candidate_id),
    FOREIGN KEY (session_id) REFERENCES SESSION(session_id),
    FOREIGN KEY (candidate_id) REFERENCES CANDIDATE(candidate_id)
);

CREATE TABLE COURSE_PREREQS (
    course_id INTEGER,
    qual_code VARCHAR(15),
    PRIMARY KEY (course_id, qual_code),
    FOREIGN KEY (course_id) REFERENCES COURSE(course_id),
    FOREIGN KEY (qual_code) REFERENCES QUALIFICATION(qual_code)
);
```

Implementation using MySQL and Apache Webserver

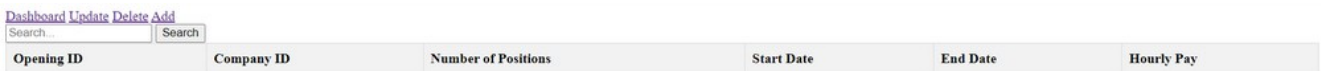
Opening ID	Company ID	Number of Positions	Start Date	End Date	Hourly Pay
1	1	3	2023-12-31	2024-11-25	26.00
2	1	4	2024-01-01		40.00
3	2	1	2024-02-10	2025-02-10	10.25
4	3	10	2024-06-05	2026-12-24	27.00
5	2	5	2024-03-15		33.00



Opening ID	Company ID	Number of Positions	Start Date	End Date	Hourly Pay
1	1	3	2023-12-31	2024-11-25	26.00
2	1	4	2024-01-01		40.00
3	2	1	2024-02-10	2025-02-10	10.25
4	3	10	2024-06-05	2026-12-24	27.00
5	2	5	2024-03-15		33.00



Opening ID	Company ID	Number of Positions	Start Date	End Date	Hourly Pay
1	1	3	2023-12-31	2024-11-25	26.00
2	1	4	2024-01-01		40.00
3	2	1	2024-02-10	2025-02-10	10.25
4	3	10	2024-06-05	2026-12-24	27.00
5	2	5	2024-03-15		33.00



Opening ID	Company ID	Number of Positions	Start Date	End Date	Hourly Pay
1	1	3	2023-12-31	2024-11-25	26.00
2	1	4	2024-01-01		40.00
3	2	1	2024-02-10	2025-02-10	10.25
4	3	10	2024-06-05	2026-12-24	27.00
5	2	5	2024-03-15		33.00