Ernest (Jiachang) Xu
CSCI 485: File and Database Management
Assignment #2: Using a Relational Database Management System named PostgreSQL
18 Feb. 2018

Dump of PostgreSQL Schema

```sql
--
-- PostgreSQL database dump
--


-- Dumped from database version 10.2
-- Dumped by pg_dump version 10.2


SET statement_timeout = 0;
SET lock_timeout = 0;
SET idle_in_transaction_session_timeout = 0;
SET client_encoding = 'UTF8';
SET standard_conforming_strings = on;
SET check_function_bodies = false;
SET client_min_messages = warning;
SET row_security = off;


SET search_path = public, pg_catalog;


SET default_tablespace = '';


SET default_with_oids = false;


--
-- Name: chatbot; Type: TABLE; Schema: public; Owner: postgres
--


CREATE TABLE chatbot (
    questionid bigint NOT NULL,
    userid bigint NOT NULL,
    question character varying NOT NULL
);
```

```sql
ALTER TABLE chatbot OWNER TO postgres;


--
-- Name: chatbotanswer; Type: TABLE; Schema: public; Owner: postgres
--


CREATE TABLE chatbotanswer (
    applicationid bigint NOT NULL,
    questionid bigint NOT NULL,
    answer character varying NOT NULL
);



ALTER TABLE chatbotanswer OWNER TO postgres;


--
-- Name: company; Type: TABLE; Schema: public; Owner: postgres
--


CREATE TABLE company (
    companyid bigint NOT NULL,
    company_name character varying,
    social_media_handle character varying,
    company_summary character varying,
    company_logo character varying,
    company_size character varying,
    company_website character varying
);



ALTER TABLE company OWNER TO postgres;


--
-- Name: employer; Type: TABLE; Schema: public; Owner: postgres
--
```

```sql
CREATE TABLE employer (
    userid bigint NOT NULL,
    employer_position character varying NOT NULL
);



ALTER TABLE employer OWNER TO postgres;


--
-- Name: employment; Type: TABLE; Schema: public; Owner: postgres
--


CREATE TABLE employment (
    companyid bigint NOT NULL,
    userid bigint NOT NULL
);



ALTER TABLE employment OWNER TO postgres;


--
-- Name: institute; Type: TABLE; Schema: public; Owner: postgres
--


CREATE TABLE institute (
    instituteid bigint NOT NULL,
    name character varying NOT NULL
);



ALTER TABLE institute OWNER TO postgres;


--
-- Name: jobapplication; Type: TABLE; Schema: public; Owner: postgres
--
```

```sql
CREATE TABLE jobapplication (
    applicationid bigint NOT NULL,
    job_seekerid bigint NOT NULL,
    jobid bigint NOT NULL,
    apply_date date NOT NULL
);



ALTER TABLE jobapplication OWNER TO postgres;


--
-- Name: jobcategory; Type: TABLE; Schema: public; Owner: postgres
--


CREATE TABLE jobcategory (
    categoryid bigint NOT NULL,
    category_name character varying NOT NULL
);



ALTER TABLE jobcategory OWNER TO postgres;


--
-- Name: joblist; Type: TABLE; Schema: public; Owner: postgres
--


CREATE TABLE joblist (
    jobid bigint NOT NULL,
    userid bigint NOT NULL,
    title character varying NOT NULL,
    salary character varying NOT NULL,
    post_date date NOT NULL,
    responsibility character varying NOT NULL,
    time_demand character varying NOT NULL
);
```

```sql
ALTER TABLE joblist OWNER TO postgres;


--
-- Name: joblistcategory; Type: TABLE; Schema: public; Owner: postgres
--


CREATE TABLE joblistcategory (
    jobid bigint NOT NULL,
    categoryid bigint NOT NULL
);



ALTER TABLE joblistcategory OWNER TO postgres;


--
-- Name: jobseeker; Type: TABLE; Schema: public; Owner: postgres
--


CREATE TABLE jobseeker (
    userid bigint NOT NULL,
    summary character varying NOT NULL,
    is_relation_ok boolean NOT NULL,
    experience character varying NOT NULL,
    premium_level integer NOT NULL
);



ALTER TABLE jobseeker OWNER TO postgres;


--
-- Name: jobseekercategory; Type: TABLE; Schema: public; Owner: postgres
--


CREATE TABLE jobseekercategory (
    userid bigint NOT NULL,
    categoryid bigint NOT NULL
);
```

```sql
ALTER TABLE jobseekercategory OWNER TO postgres;


--
-- Name: jobseekercertificate; Type: TABLE; Schema: public; Owner: postgres
--


CREATE TABLE jobseekercertificate (
    userid bigint NOT NULL,
    certificate_name character varying NOT NULL
);


ALTER TABLE jobseekercertificate OWNER TO postgres;


--
-- Name: jobseekereducation; Type: TABLE; Schema: public; Owner: postgres
--


CREATE TABLE jobseekereducation (
    userid bigint NOT NULL,
    instituteid bigint NOT NULL,
    start_date date NOT NULL,
    end_date date NOT NULL,
    degree_name character varying NOT NULL
);


ALTER TABLE jobseekereducation OWNER TO postgres;


--
-- Name: jobseekerhonor; Type: TABLE; Schema: public; Owner: postgres
--


CREATE TABLE jobseekerhonor (
    userid bigint NOT NULL,
```

```sql
    honor_name character varying NOT NULL
);



ALTER TABLE jobseekerhonor OWNER TO postgres;


--
-- Name: jobseekerskill; Type: TABLE; Schema: public; Owner: postgres
--


CREATE TABLE jobseekerskill (
    userid bigint NOT NULL,
    skillid bigint NOT NULL
);



ALTER TABLE jobseekerskill OWNER TO postgres;


--
-- Name: message; Type: TABLE; Schema: public; Owner: postgres
--


CREATE TABLE message (
    messageid bigint NOT NULL,
    from_userid bigint NOT NULL,
    to_userid bigint NOT NULL,
    reply_messageid bigint NOT NULL,
    message character varying NOT NULL,
    create_date date NOT NULL
);



ALTER TABLE message OWNER TO postgres;


--
-- Name: skill; Type: TABLE; Schema: public; Owner: postgres
--
```

```sql
CREATE TABLE skill (
    skillid bigint NOT NULL,
    skill_name character varying NOT NULL
);



ALTER TABLE skill OWNER TO postgres;


--
-- Name: userparagon; Type: TABLE; Schema: public; Owner: postgres
--


CREATE TABLE userparagon (
    userid bigint NOT NULL,
    phone character varying NOT NULL,
    email character varying NOT NULL,
    profile_picture_url character varying,
    first_name character varying NOT NULL,
    last_name character varying NOT NULL,
    street_adress character varying,
    city character varying,
    state_pronvince character varying,
    country character varying,
    zipcode character varying
);



ALTER TABLE userparagon OWNER TO postgres;


--
-- Data for Name: chatbot; Type: TABLE DATA; Schema: public; Owner: postgres
--


COPY chatbot (questionid, userid, question) FROM stdin;
\.
```

```
--
-- Data for Name: chatbotanswer; Type: TABLE DATA; Schema: public; Owner: postgres
--

COPY chatbotanswer (applicationid, questionid, answer) FROM stdin;
\.


--
-- Data for Name: company; Type: TABLE DATA; Schema: public; Owner: postgres
--

COPY company (companyid, company_name, social_media_handle, company_summary, company_logo,
company_size, company_website) FROM stdin;
\.


--
-- Data for Name: employer; Type: TABLE DATA; Schema: public; Owner: postgres
--

COPY employer (userid, employer_position) FROM stdin;
\.


--
-- Data for Name: employment; Type: TABLE DATA; Schema: public; Owner: postgres
--

COPY employment (companyid, userid) FROM stdin;
\.


--
-- Data for Name: institute; Type: TABLE DATA; Schema: public; Owner: postgres
--
```

```
COPY institute (instituteid, name) FROM stdin;
\.



--
-- Data for Name: jobapplication; Type: TABLE DATA; Schema: public; Owner: postgres
--


COPY jobapplication (applicationid, job_seekerid, jobid, apply_date) FROM stdin;
\.



--
-- Data for Name: jobcategory; Type: TABLE DATA; Schema: public; Owner: postgres
--


COPY jobcategory (categoryid, category_name) FROM stdin;
\.



--
-- Data for Name: joblist; Type: TABLE DATA; Schema: public; Owner: postgres
--


COPY joblist (jobid, userid, title, salary, post_date, responsibility, time_demand) FROM stdin;
\.



--
-- Data for Name: joblistcategory; Type: TABLE DATA; Schema: public; Owner: postgres
--


COPY joblistcategory (jobid, categoryid) FROM stdin;
\.
```

```
--
-- Data for Name: jobseeker; Type: TABLE DATA; Schema: public; Owner: postgres
--


COPY jobseeker (userid, summary, is_relation_ok, experience, premium_level) FROM stdin;
\.




--
-- Data for Name: jobseekercategory; Type: TABLE DATA; Schema: public; Owner: postgres
--


COPY jobseekercategory (userid, categoryid) FROM stdin;
\.




--
-- Data for Name: jobseekercertificate; Type: TABLE DATA; Schema: public; Owner: postgres
--


COPY jobseekercertificate (userid, certificate_name) FROM stdin;
\.




--
-- Data for Name: jobseekereducation; Type: TABLE DATA; Schema: public; Owner: postgres
--


COPY jobseekereducation (userid, instituteid, start_date, end_date, degree_name) FROM stdin;
\.




--
-- Data for Name: jobseekerhonor; Type: TABLE DATA; Schema: public; Owner: postgres
--


COPY jobseekerhonor (userid, honor_name) FROM stdin;
```

```
\.




--
-- Data for Name: jobseekerskill; Type: TABLE DATA; Schema: public; Owner: postgres
--


COPY jobseekerskill (userid, skillid) FROM stdin;
\.




--
-- Data for Name: message; Type: TABLE DATA; Schema: public; Owner: postgres
--


COPY message (messageid, from_userid, to_userid, reply_messageid, message, create_date) FROM stdin;
\.




--
-- Data for Name: skill; Type: TABLE DATA; Schema: public; Owner: postgres
--


COPY skill (skillid, skill_name) FROM stdin;
\.




--
-- Data for Name: userparagon; Type: TABLE DATA; Schema: public; Owner: postgres
--


COPY userparagon (userid, phone, email, profile_picture_url, first_name, last_name, street_adress, city,
state_pronvince, country, zipcode) FROM stdin;
\.




--
```

```sql
-- Name: chatbot chatbot_pkey; Type: CONSTRAINT; Schema: public; Owner: postgres
--


ALTER TABLE ONLY chatbot
    ADD CONSTRAINT chatbot_pkey PRIMARY KEY (questionid);



--
-- Name: chatbotanswer chatbotanswer_pkey; Type: CONSTRAINT; Schema: public; Owner: postgres
--


ALTER TABLE ONLY chatbotanswer
    ADD CONSTRAINT chatbotanswer_pkey PRIMARY KEY (applicationid, questionid);


--
-- Name: company company_pkey; Type: CONSTRAINT; Schema: public; Owner: postgres
--


ALTER TABLE ONLY company
    ADD CONSTRAINT company_pkey PRIMARY KEY (companyid);


--
-- Name: employer employer_pkey; Type: CONSTRAINT; Schema: public; Owner: postgres
--


ALTER TABLE ONLY employer
    ADD CONSTRAINT employer_pkey PRIMARY KEY (userid);


--
-- Name: employment employment_pkey; Type: CONSTRAINT; Schema: public; Owner: postgres
--


ALTER TABLE ONLY employment
    ADD CONSTRAINT employment_pkey PRIMARY KEY (companyid, userid);
```

```
--
-- Name: institute institute_pkey; Type: CONSTRAINT; Schema: public; Owner: postgres
--


ALTER TABLE ONLY institute
    ADD CONSTRAINT institute_pkey PRIMARY KEY (instituteid);




--
-- Name: jobapplication jobapplication_pkey; Type: CONSTRAINT; Schema: public; Owner: postgres
--


ALTER TABLE ONLY jobapplication
    ADD CONSTRAINT jobapplication_pkey PRIMARY KEY (applicationid);




--
-- Name: jobcategory jobcategory_pkey; Type: CONSTRAINT; Schema: public; Owner: postgres
--


ALTER TABLE ONLY jobcategory
    ADD CONSTRAINT jobcategory_pkey PRIMARY KEY (categoryid);




--
-- Name: joblist joblist_pkey; Type: CONSTRAINT; Schema: public; Owner: postgres
--


ALTER TABLE ONLY joblist
    ADD CONSTRAINT joblist_pkey PRIMARY KEY (jobid);




--
-- Name: joblistcategory joblistcategory_pkey; Type: CONSTRAINT; Schema: public; Owner: postgres
--
```

```sql
ALTER TABLE ONLY joblistcategory
    ADD CONSTRAINT joblistcategory_pkey PRIMARY KEY (jobid, categoryid);



--
-- Name: jobseeker jobseeker_pkey; Type: CONSTRAINT; Schema: public; Owner: postgres
--


ALTER TABLE ONLY jobseeker
    ADD CONSTRAINT jobseeker_pkey PRIMARY KEY (userid);



--
-- Name: jobseekercategory jobseekercategory_pkey; Type: CONSTRAINT; Schema: public; Owner: postgres
--


ALTER TABLE ONLY jobseekercategory
    ADD CONSTRAINT jobseekercategory_pkey PRIMARY KEY (userid, categoryid);



--
-- Name: jobseekercertificate jobseekercertificate_pkey; Type: CONSTRAINT; Schema: public; Owner: postgres
--


ALTER TABLE ONLY jobseekercertificate
    ADD CONSTRAINT jobseekercertificate_pkey PRIMARY KEY (userid, certificate_name);



--
-- Name: jobseekereducation jobseekereducation_pkey; Type: CONSTRAINT; Schema: public; Owner: postgres
--


ALTER TABLE ONLY jobseekereducation
    ADD CONSTRAINT jobseekereducation_pkey PRIMARY KEY (userid, instituteid);
```

```
--
-- Name: jobseekerhonor jobseekerhonor_pkey; Type: CONSTRAINT; Schema: public; Owner: postgres
--


ALTER TABLE ONLY jobseekerhonor
    ADD CONSTRAINT jobseekerhonor_pkey PRIMARY KEY (userid, honor_name);



--
-- Name: jobseekerskill jobseekerskill_pkey; Type: CONSTRAINT; Schema: public; Owner: postgres
--


ALTER TABLE ONLY jobseekerskill
    ADD CONSTRAINT jobseekerskill_pkey PRIMARY KEY (userid, skillid);



--
-- Name: message message_pkey; Type: CONSTRAINT; Schema: public; Owner: postgres
--


ALTER TABLE ONLY message
    ADD CONSTRAINT message_pkey PRIMARY KEY (messageid);



--
-- Name: skill skill_pkey; Type: CONSTRAINT; Schema: public; Owner: postgres
--


ALTER TABLE ONLY skill
    ADD CONSTRAINT skill_pkey PRIMARY KEY (skillid);



--
-- Name: userparagon userparagon_pkey; Type: CONSTRAINT; Schema: public; Owner: postgres
--


ALTER TABLE ONLY userparagon
```

```
    ADD CONSTRAINT userparagon_pkey PRIMARY KEY (userid);



--
-- Name: chatbot chatbot_userid_fkey; Type: FK CONSTRAINT; Schema: public; Owner: postgres
--


ALTER TABLE ONLY chatbot
    ADD CONSTRAINT chatbot_userid_fkey FOREIGN KEY (userid) REFERENCES userparagon(userid);



--
-- Name: chatbotanswer chatbotanswer_applicationid_fkey; Type: FK CONSTRAINT; Schema: public; Owner:
postgres
--


ALTER TABLE ONLY chatbotanswer
    ADD CONSTRAINT chatbotanswer_applicationid_fkey FOREIGN KEY (applicationid) REFERENCES
jobapplication(applicationid);



--
-- Name: chatbotanswer chatbotanswer_questionid_fkey; Type: FK CONSTRAINT; Schema: public; Owner: postgres
--


ALTER TABLE ONLY chatbotanswer
    ADD CONSTRAINT chatbotanswer_questionid_fkey FOREIGN KEY (questionid) REFERENCES
chatbot(questionid);



--
-- Name: employer employer_userid_fkey; Type: FK CONSTRAINT; Schema: public; Owner: postgres
--


ALTER TABLE ONLY employer
    ADD CONSTRAINT employer_userid_fkey FOREIGN KEY (userid) REFERENCES userparagon(userid);
```

```
--
-- Name: employment employment_companyid_fkey; Type: FK CONSTRAINT; Schema: public; Owner: postgres
--


ALTER TABLE ONLY employment
    ADD CONSTRAINT employment_companyid_fkey FOREIGN KEY (companyid) REFERENCES
company(companyid);




--
-- Name: employment employment_userid_fkey; Type: FK CONSTRAINT; Schema: public; Owner: postgres
--


ALTER TABLE ONLY employment
    ADD CONSTRAINT employment_userid_fkey FOREIGN KEY (userid) REFERENCES userparagon(userid);




--
-- Name: jobapplication jobapplication_job_seekerid_fkey; Type: FK CONSTRAINT; Schema: public; Owner: postgres
--


ALTER TABLE ONLY jobapplication
    ADD CONSTRAINT jobapplication_job_seekerid_fkey FOREIGN KEY (job_seekerid) REFERENCES
jobseeker(userid);




--
-- Name: jobapplication jobapplication_jobid_fkey; Type: FK CONSTRAINT; Schema: public; Owner: postgres
--


ALTER TABLE ONLY jobapplication
    ADD CONSTRAINT jobapplication_jobid_fkey FOREIGN KEY (jobid) REFERENCES joblist(jobid);




--
-- Name: joblist joblist_userid_fkey; Type: FK CONSTRAINT; Schema: public; Owner: postgres
```

```
--

ALTER TABLE ONLY joblist
    ADD CONSTRAINT joblist_userid_fkey FOREIGN KEY (userid) REFERENCES employer(userid);



--
-- Name: joblistcategory joblistcategory_categoryid_fkey; Type: FK CONSTRAINT; Schema: public; Owner: postgres
--

ALTER TABLE ONLY joblistcategory
    ADD CONSTRAINT joblistcategory_categoryid_fkey FOREIGN KEY (categoryid) REFERENCES
jobcategory(categoryid);



--
-- Name: joblistcategory joblistcategory_jobid_fkey; Type: FK CONSTRAINT; Schema: public; Owner: postgres
--

ALTER TABLE ONLY joblistcategory
    ADD CONSTRAINT joblistcategory_jobid_fkey FOREIGN KEY (jobid) REFERENCES joblist(jobid);



--
-- Name: jobseeker jobseeker_userid_fkey; Type: FK CONSTRAINT; Schema: public; Owner: postgres
--

ALTER TABLE ONLY jobseeker
    ADD CONSTRAINT jobseeker_userid_fkey FOREIGN KEY (userid) REFERENCES userparagon(userid);



--
-- Name: jobseekercategory jobseekercategory_categoryid_fkey; Type: FK CONSTRAINT; Schema: public; Owner:
postgres
--

ALTER TABLE ONLY jobseekercategory
```

```
    ADD CONSTRAINT jobseekercategory_categoryid_fkey FOREIGN KEY (categoryid) REFERENCES
jobcategory(categoryid);



--
-- Name: jobseekercategory jobseekercategory_userid_fkey; Type: FK CONSTRAINT; Schema: public; Owner:
postgres
--

ALTER TABLE ONLY jobseekercategory
    ADD CONSTRAINT jobseekercategory_userid_fkey FOREIGN KEY (userid) REFERENCES jobseeker(userid);



--
-- Name: jobseekercertificate jobseekercertificate_userid_fkey; Type: FK CONSTRAINT; Schema: public; Owner:
postgres
--

ALTER TABLE ONLY jobseekercertificate
    ADD CONSTRAINT jobseekercertificate_userid_fkey FOREIGN KEY (userid) REFERENCES jobseeker(userid);



--
-- Name: jobseekereducation jobseekereducation_instituteid_fkey; Type: FK CONSTRAINT; Schema: public; Owner:
postgres
--

ALTER TABLE ONLY jobseekereducation
    ADD CONSTRAINT jobseekereducation_instituteid_fkey FOREIGN KEY (instituteid) REFERENCES
institute(instituteid);



--
-- Name: jobseekereducation jobseekereducation_userid_fkey; Type: FK CONSTRAINT; Schema: public; Owner:
postgres
--
```

```
ALTER TABLE ONLY jobseekereducation
    ADD CONSTRAINT jobseekereducation_userid_fkey FOREIGN KEY (userid) REFERENCES userparagon(userid);



--
-- Name: jobseekerhonor jobseekerhonor_userid_fkey; Type: FK CONSTRAINT; Schema: public; Owner: postgres
--


ALTER TABLE ONLY jobseekerhonor
    ADD CONSTRAINT jobseekerhonor_userid_fkey FOREIGN KEY (userid) REFERENCES jobseeker(userid);



--
-- Name: jobseekerskill jobseekerskill_skillid_fkey; Type: FK CONSTRAINT; Schema: public; Owner: postgres
--


ALTER TABLE ONLY jobseekerskill
    ADD CONSTRAINT jobseekerskill_skillid_fkey FOREIGN KEY (skillid) REFERENCES skill(skillid);



--
-- Name: jobseekerskill jobseekerskill_userid_fkey; Type: FK CONSTRAINT; Schema: public; Owner: postgres
--


ALTER TABLE ONLY jobseekerskill
    ADD CONSTRAINT jobseekerskill_userid_fkey FOREIGN KEY (userid) REFERENCES jobseeker(userid);



--
-- Name: message message_from_userid_fkey; Type: FK CONSTRAINT; Schema: public; Owner: postgres
--


ALTER TABLE ONLY message
    ADD CONSTRAINT message_from_userid_fkey FOREIGN KEY (from_userid) REFERENCES
userparagon(userid);
```

```
--

-- Name: message message_to_userid_fkey; Type: FK CONSTRAINT; Schema: public; Owner: postgres

--


ALTER TABLE ONLY message
    ADD CONSTRAINT message_to_userid_fkey FOREIGN KEY (to_userid) REFERENCES userparagon(userid);



--

-- Name: SCHEMA public; Type: ACL; Schema: -; Owner: postgres

--


GRANT ALL ON SCHEMA public TO PUBLIC;



--

-- PostgreSQL database dump complete

--
```

SQL Queries

Query 1:

```
SELECT u.first_name AS first_name, u.last_name AS last_name,
    u.profile_picture_url AS profile_image_URL, m.message AS message_content, m.create_date AS message_date
    FROM userparagon u, employer e, message m
    WHERE e.userid = cast(90109 AS BIGINT) AND m.to_userid = e.userid AND u.userid = m.from_userid
    ORDER BY m.create_date DESC
    LIMIT 5;
```

5 rows retrieved starting from 1 in 111ms (execution: 58ms, fetching: 53ms)

	first_name	last_name	profile_image_url	message_content	message_date
1	Richard	Hawkins	http://9a0502af-3422-4f3d-a278-e8c24cd5502c.com	M:c978b948-f294-409b-a1ee-fe9ca6ef4821	2017-06-09
2	Paul	Black	http://bb6e0156-b9f4-405c-9d9e-968cfde68cee.com	M:509ca233-1fb8-4b9e-9786-83c2bf103f83	2017-03-22
3	Paul	Black	http://bb6e0156-b9f4-405c-9d9e-968cfde68cee.com	M:4db2c35d-cd5d-4df0-8e8d-b6c48509b2af	2017-03-08
4	Paul	Black	http://bb6e0156-b9f4-405c-9d9e-968cfde68cee.com	M:9c17d0bc-98e8-4dd6-97f6-3908e756270f	2016-04-16
5	Paul	Black	http://bb6e0156-b9f4-405c-9d9e-968cfde68cee.com	M:bd637918-b030-4c45-a7ba-a2356e21cfa2	2015-09-30

Query 2:

```
SELECT jl.title AS title, jl.salary AS salary, jl.post_date AS post_date,
    jl.responsibility AS responsibility, jl.time_demand AS time_demand
    FROM employer e, joblist jl, jobapplication ja
    WHERE e.userid = cast(90196 AS BIGINT) AND e.userid = jl.userid AND jl.jobid = ja.jobid
    GROUP BY jl.jobid
    ORDER BY count(ja.applicationid) DESC
    LIMIT 5;
```

5 rows retrieved starting from 1 in 90ms (execution: 58ms, fetching: 32ms)

	title	salary	post_date	responsibility	time_demand
1	Sushi Chef	259845	2016-02-13	Responsibility:683c7a9f-4f58-4bc0-a05c-23a4b6369831	Co-op
2	City Comptroller	122115	2015-11-23	Responsibility:cb5c438e-0b8e-4a93-95af-ca08400bd97a	Co-op
3	Oxidation Engineer	287476	2015-12-26	Responsibility:aaabdf4d-738e-4dc2-9512-dc9519c0d09b	Co-op
4	Chief Financial Officer	65064	2017-10-12	Responsibility:f680766f-6307-400e-8b02-713469481d43	Co-op
5	Rig Supervisor	339524	2015-07-31	Responsibility:cc6bc431-b815-447b-bcc5-f9f0d211d202	Co-op

Query 3:

```
SELECT js.summary AS summary, js.experience AS experience,
    string_agg(i.name, ', ') as education_institute_names, string_agg(s.skill_name, ', ') AS skill,
    string_agg(jsh.honor_name, ', ') as honors, string_agg(jsc.certificate_name, ', ') as certificates,
    string_agg(c.question, ', ') AS questions, string_agg(ca.answer, ', ') AS answers
    FROM employer e, joblist jl, jobapplication ja, jobseeker js, chatbotanswer ca, chatbot c,
        jobseekereducation jse, institute i, jobseekerskill jss, skill s,
        jobseekerhonor jsh, jobseekercertificate jsc
    WHERE e.userid = cast(90196 AS BIGINT) AND jl.userid = e.userid AND
        jl.jobid = cast(4401 AS BIGINT) AND jl.jobid = ja.jobid AND
        ja.applicationid = ca.applicationid and ca.questionid = c.questionid AND
        ja.job_seekerid = js.userid AND js.userid = jsc.userid AND
```

```
        js.userid = jse.userid AND jse.instituteid = i.instituteid AND

        js.userid = jss.userid AND jss.skillid = s.skillid AND js.userid = jsh.userid

   GROUP BY js.userid
```

9 rows retrieved starting from 1 in 189ms (execution: 131ms, fetching: 58ms)

Query 4:

```
WITH RECURSIVE MessageCTE AS (

  (

    SELECT m1.*

      FROM message m1

      WHERE (m1.from_userid = cast(1 AS BIGINT) OR m1.to_userid = cast(1 AS BIGINT)) AND

         m1.reply_messageid = cast(-1 AS BIGINT)

  )

  UNION ALL

  (

    SELECT m2.*

      FROM message m2

      INNER JOIN MessageCTE mcte

      ON m2.reply_messageid = mcte.messageid

  )

)
SELECT DISTINCT m.messageid AS message_ID,

  s.first_name AS sender_first_name, s.last_name AS sender_last_name, s.profile_picture_url AS
sender_profile_image_URL,

  m.reply_messageid AS reply_ID,

  r.first_name AS receiver_first_name, r.last_name AS receiver_last_name, r.profile_picture_url AS
receiver_profile_image_URL,

  m.message as message_content, m.create_date as message_date

  FROM MessageCTE m,  userparagon s, userparagon r

  WHERE m.from_userid = s.userid AND m.to_userid = r.userid

  ORDER BY m.reply_messageid ASC, m.messageid ASC
```

17 rows retrieved starting from 1 in 386ms (execution: 325ms, fetching: 61ms)

	message_id	sender_first_name	sender_last_name	sender_profile_image_url	reply_id	receiver_first_name	receiver_last_name	receiver_profile_image_url	message_content	message_date
1	22701	Rachel	Desoto	http://9e3d4e25-fa2a…	-1	Lindsey	Alexander	http://1704b243-2f9b-…	M:e20be945-94c…	2015-09-27
2	45008	Rachel	Desoto	http://9e3d4e25-fa2a…	-1	David	Schaefer	http://3d55a164-28c3-…	M:9e514a79-093…	2015-09-08
3	72477	Angela	Lee	http://395ee3f8-8d72…	-1	Rachel	Desoto	http://9e3d4e25-fa2a-…	M:38147767-f55…	2016-06-11
4	75992	Charles	Fielding	http://4209081a-46d4…	-1	Rachel	Desoto	http://9e3d4e25-fa2a-…	M:b2ecf7cb-566…	2015-05-30
5	76816	Anthony	Garza	http://9a25d338-1e13…	-1	Rachel	Desoto	http://9e3d4e25-fa2a-…	M:cf941f0b-0c6…	2015-12-30
6	191304	Angela	Lee	http://395ee3f8-8d72…	72477	Rachel	Desoto	http://9e3d4e25-fa2a-…	M:6b814b03-c80…	2016-01-07
7	235866	Angela	Lee	http://395ee3f8-8d72…	72477	Rachel	Desoto	http://9e3d4e25-fa2a-…	M:e41ddc95-812…	2015-08-04
8	147666	Charles	Fielding	http://4209081a-46d4…	75992	Rachel	Desoto	http://9e3d4e25-fa2a-…	M:6428a590-2a3…	2015-11-24
9	140034	Anthony	Garza	http://9a25d338-1e13…	76816	Rachel	Desoto	http://9e3d4e25-fa2a-…	M:485899f7-fdd…	2015-06-26
10	140035	Alicia	Westra	http://a6bc1051-53a6…	140034	Anna	Loring	http://6f440e7c-1a2f-…	M:2dcafa2b-d6a…	2015-03-24
11	140036	Anthony	Garza	http://9a25d338-1e13…	140035	Rachel	Desoto	http://9e3d4e25-fa2a-…	M:245548a4-81f…	2017-07-14
12	147667	Faye	Robinson	http://3e853dae-7a66…	147666	William	McNeil	http://e8fb11fb-2714-…	M:802a3b36-f61…	2015-11-30
13	147668	Charles	Fielding	http://4209081a-46d4…	147667	Rachel	Desoto	http://9e3d4e25-fa2a-…	M:c0e1d832-3de…	2015-11-30
14	191305	Robert	Phelan	http://88a2f27f-bafe…	191304	Abram	Pilon	http://6507da5b-95f9-…	M:645ae96d-736…	2015-07-11
15	191306	Roger	Salter	http://a4260514-d75d…	191305	Clarence	Jones	http://4da524ba-2618-…	M:fd6d97c1-815…	2015-07-26
16	235867	Scott	Byrd	http://416bfc15-b727…	235866	Elizabeth	Knopp	http://70709c62-2cb6-…	M:60a7fc52-938…	2015-04-01
17	235868	Carlos	Yard	http://116e07a9-d9f6…	235867	Thomas	Brown	http://dda04bd7-a9ec-…	M:3d3b3858-b4c…	2016-04-16

Query 5:

```sql
SELECT c.company_name AS company_name, c.company_website AS company_URL, count(ja.job_seekerid) AS
number_applications
  FROM company c, employment et, employer er, joblist jl, jobapplication ja
  WHERE c.companyid = et.companyid AND et.userid = er.userid AND er.userid = jl.userid AND
    jl.jobid = ja.jobid AND ja.apply_date >= '2015-01-01' AND ja.apply_date < '2019-01-01'
  GROUP BY c.company_name, c.company_website
  ORDER BY count(ja.job_seekerid) DESC
  LIMIT 5;
```

5 rows retrieved starting from 1 in 389ms (execution: 345ms, fetching: 44ms)

	company_name	company_url	number_applications
1	Helios Air	nanohealthcures.com	1352
2	Harvest Foods	pamleblanc.com	1334
3	Als Auto Parts	antijonru.com	1280
4	Pauls Food Mart	gwsoadi.com	1246
5	Hanover Shoe	bushwhackerbags.com	1234

Query 6:

```sql
SELECT jc.category_name AS job_category,
  cast(count(DISTINCT jlc.jobid) AS FLOAT) / cast(count(ja.applicationid) AS FLOAT) as market_vacancy
  FROM jobcategory jc, joblistcategory jlc, jobapplication ja
  WHERE jc.categoryid = jlc.categoryid AND jlc.jobid = ja.jobid
  GROUP BY jc.categoryid
  ORDER BY cast(count(DISTINCT jlc.jobid) AS FLOAT) / cast(count(ja.applicationid) AS FLOAT) DESC
  LIMIT 5;
```

5 rows retrieved starting from 1 in 207ms (execution: 192ms, fetching: 15ms)

	job_category	market_vacancy
1	Financial Risk Specialists	0.3333333333333333
2	Radiologists	0.2
3	Bicycle Repairers	0.16216216216216217
4	Executive Secretaries and Executive Administrative Assistants	0.14285714285714285
5	Shampooers	0.13636363636363635