UNIVERSIDAD PANAMERICANA
Campus México

UNIVERSIDAD PANAMERICANA

Subject : Introducción a Bases de Datos(COM112)

Professor: Sofia Ortiz Valenzuela

Deadline: 16/11/22

Ciclo: 1228

Project's Name: UPSITE MEJORADO

Members of the team		
ID	**Name**	**Career**
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Rubrics							
ID	**1-identify**		**4-impact**	**5-teams**			
	IP	**ASA**	**II**	**ER**	**TC**	**ME**	**CDTD**

Background and Problem Statement

We decided to make a database from which we used as a reference the UpSite page that students at Universidad Panamericana use to view important information about their student life during their studies. However, UpSite is confusing to use and you don't necessarily end up finding what you are looking for. That's why we decided to compile a collection of information about Universidad Panamericana students where you can consult information such as scholarships, tuition amounts, types of scholarships, teacher evaluations, schedules, student's personal information, evaluations, credits and professors.
We believe that in order for the database to not be so cumbersome or redundant, we can calculate the queries that the user wants to obtain, for example, if the user has the requirements to have a scholarship or the amount of money he/she will have to pay monthly tuition.

Solution proposal

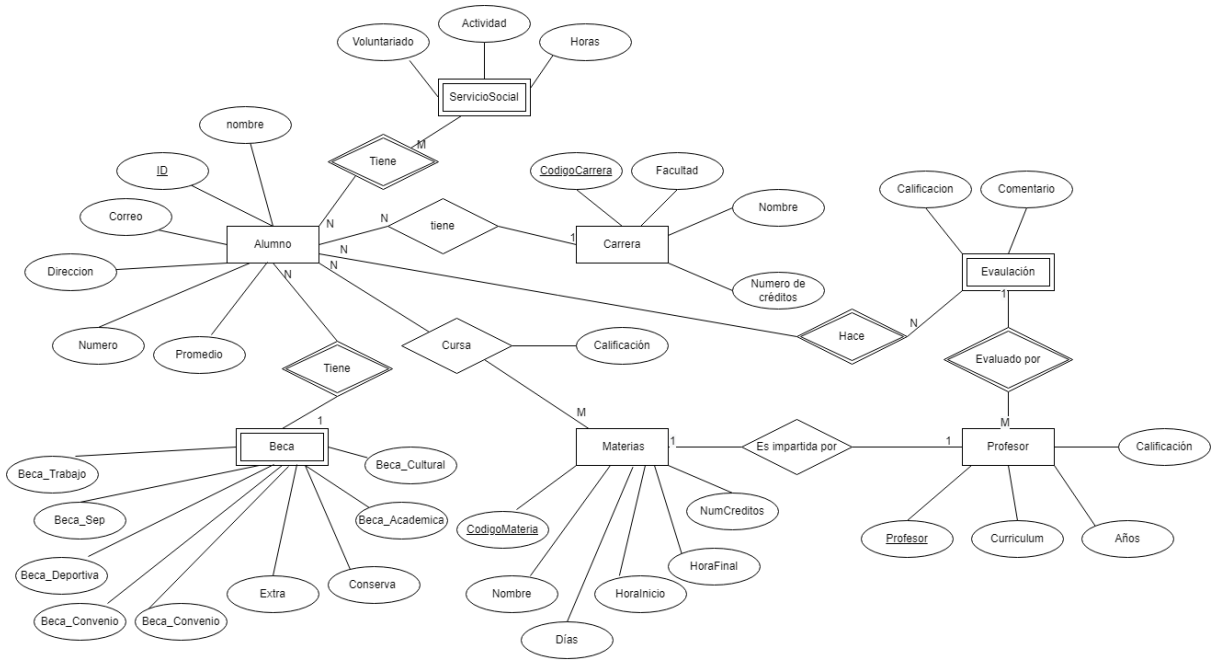
As a solution to this project we decided to create a database that contains the basic information of the students, such as personal information, subjects, professors, evaluations, scholarships, credits and social service. With these tables and with the use of foreign keys we could compile a whole database containing the relevant data per student allowing us to make queries of data that are not found in the database tables, for example, the amount of monthly money, the type of scholarship available and depending on whether you have lost it or not, we can see how many hours you have left to complete your social service, your schedule and we can see the teachers' evaluations.

Solution value

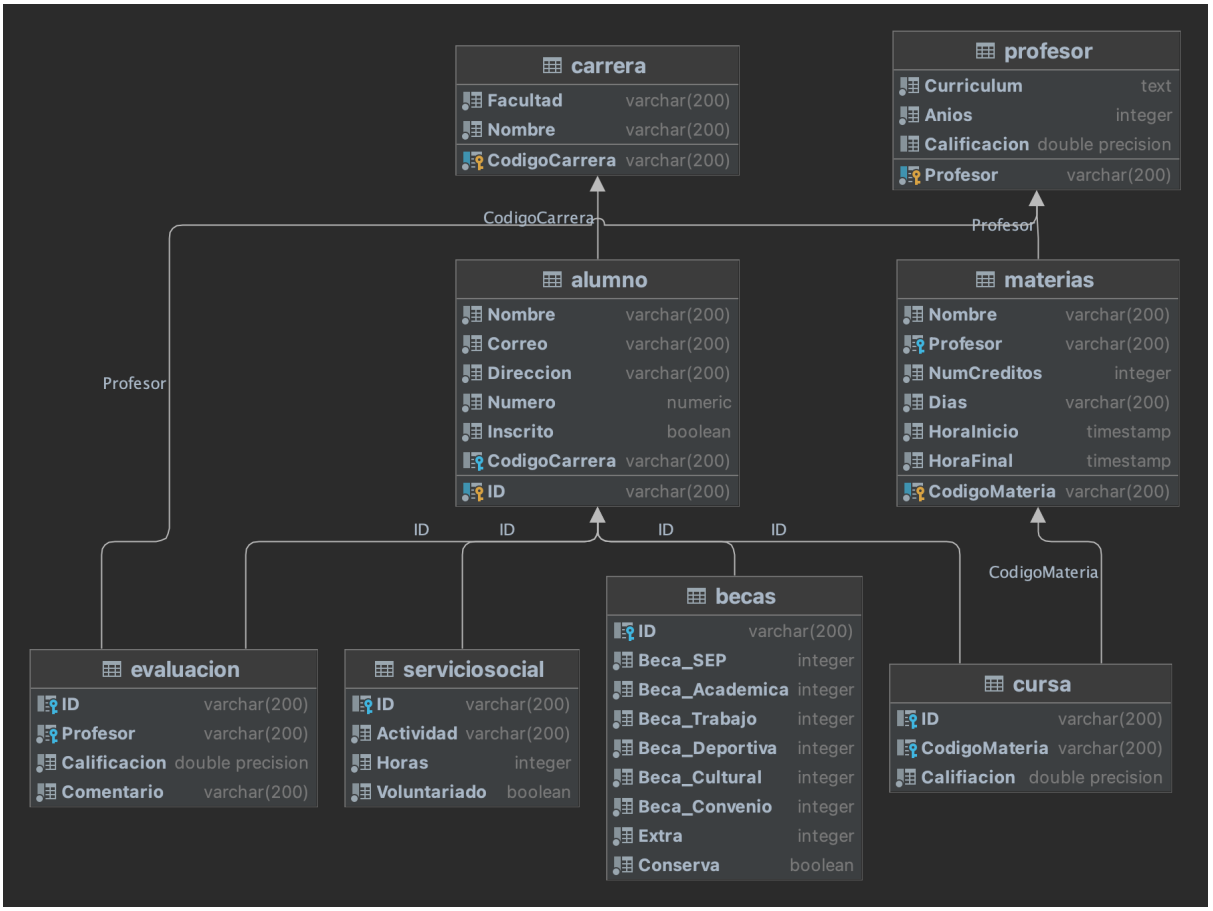
We consider that our solution could improve the complexity problem that we have in the platform of the Universidad Panamericana named UpSite since due to the functions that we will use, we would be able to make queries easier and faster to find. This database could then be implemented in a web page to also be able to collect data from there and make the pertinent validations. The database has pertinent information per student so that in case we want to increase some query we only have to make a query with SQL and add it to a function.

Implementation

Entity relationship diagram



Relational diagram (Physical diagram)



Normalization

1FN => Each field has a unique value and there are no repeating groups
2FN => Non-key fields depend entirely on the primary key, only applies to tables with composite keys.
3FN => Non-key fields are accessible only by key fields.

Tabla	Functional Dependencies	1FN	2FN	3FN
Alumno	ID => Nombre, Correo, Direccion, Numero, Inscrito, CodigoCarrera	Ok	Ok	Ok
Becas	ID=> Beca_Sep, Beca_Academica, Beca_Trabajo, Beca_Deportiva, Beca_Cultural, Beca_Convenio, Extra, Conserva	Ok	Ok	Ok
Carrera	CodigoCarrera => Facultad, Nombre	Ok	Ok	Ok

Serviciosocial	ID=> Actividad, Horas, Voluntariado	Ok	Ok	Ok
Evaluación	ID, Profesor => Calificacion, Comentario	Ok	Ok	Ok
Cursa	ID, CodigoMateria => Calificacion	Ok	Ok	Ok
Materias	CodigoMateria => Nombre, Profesor, NumCreditos, Días, HoraInicio, HoraFinal	Ok	Ok	Ok
Profesor	Profesor => Curriculum, Años, Calificacion	Ok	Ok	Ok

DB Creation

Table creation scripts

```
Create SCHEMA up_SITE_2;
CREATE TABLE up_SITE_2.Carrera (
    CodigoCarrera varchar(200) PRIMARY KEY ,
    Facultad varchar(200)   NOT NULL,
    Nombre varchar(200)   NOT NULL
);

CREATE TABLE up_SITE_2.Profesor (
    Profesor varchar(200)  PRIMARY KEY,
    Curriculum text   NOT NULL,
    Anios int   NOT NULL,
    Calificacion float
);
CREATE TABLE up_SITE_2.Materias (
    CodigoMateria varchar(200)  PRIMARY KEY ,
    Nombre varchar(200)   NOT NULL,
    Profesor varchar(200)   NOT NULL,
    NumCreditos int   NOT NULL,
    Dias varchar(200)   NOT NULL,
    HoraInicio time   NOT NULL,
    HoraFinal time   NOT NULL,
    CONSTRAINT FK_Profesor FOREIGN KEY(Profesor) REFERENCES
up_SITE_2.Profesor(Profesor)
);

CREATE TABLE up_SITE_2.Alumno (
    ID varchar(200)   PRIMARY KEY ,
    Nombre varchar(200)   NOT NULL,
    Correo varchar(200)   NOT NULL,
    Direccion varchar(200)   NOT NULL,
    Numero numeric   NOT NULL,
```

```
    Inscrito bool   NOT NULL,
    CodigoCarrera varchar(200),
    Voluntariado bool   NOT NULL,
    CONSTRAINT FK_Carrera FOREIGN KEY(CodigoCarrera) REFERENCES
up_SITE_2.Carrera(CodigoCarrera)
);

CREATE TABLE up_SITE_2.Becas (
    ID varchar(200) PRIMARY KEY,
    Beca_SEP int   NOT NULL,
    Beca_Academica int   NOT NULL,
    Beca_Trabajo int   NOT NULL,
    Beca_Deportiva int   NOT NULL,
    Beca_Cultural int   NOT NULL,
    Beca_Convenio int   NOT NULL,
    Extra int   NOT NULL,
    Conserva bool   NOT NULL,
    CONSTRAINT FK_ID FOREIGN KEY(ID) REFERENCES up_SITE_2.Alumno(ID)

);

CREATE TABLE up_SITE_2.Cursa (
    ID varchar(200),
    CodigoMateria varchar(200),
    Califiacion float   NOT NULL,
    CONSTRAINT FK_ID FOREIGN KEY(ID) REFERENCES up_SITE_2.Alumno(ID),
    CONSTRAINT FK_Materia FOREIGN KEY(CodigoMateria) REFERENCES
up_SITE_2.Materias(CodigoMateria)

);

CREATE TABLE up_SITE_2.Evaluacion (
    ID varchar(200),
    Profesor varchar(200),
    Calificacion float   NOT NULL,
    Comentario varchar(200)   NOT NULL,
    CONSTRAINT FK_ID FOREIGN KEY(ID) REFERENCES up_SITE_2.Alumno(ID) ,
    CONSTRAINT FK_Profesor FOREIGN KEY(Profesor) REFERENCES
up_SITE_2.Profesor(Profesor)
);

CREATE TABLE up_SITE_2.ServicioSocial (
    ID varchar(200),
    Actividad varchar(200)  PRIMARY KEY ,
    Horas int   NOT NULL,
    CONSTRAINT FK_ID FOREIGN KEY(ID) REFERENCES up_SITE_2.Alumno(ID)
);
```

Scripts for inserting records into DB

```
--CARRERA
INSERT INTO up_site_2.Carrera (CodigoCarrera, Facultad, Nombre) VALUES ('IID',
'INGENIERIAS', 'Innovación y Diseño');
INSERT INTO up_site_2.Carrera (CodigoCarrera, Facultad, Nombre) VALUES ('ECM',
'EMPRESARIALES', 'COMUNICACION');
INSERT INTO up_site_2.Carrera (CodigoCarrera, Facultad, Nombre) VALUES ('DER',
'HUMANIDADES', 'DERECHO');
INSERT INTO up_site_2.Carrera (CodigoCarrera, Facultad, Nombre) VALUES ('MC',
'SALUD', 'MEDICINA');
INSERT INTO up_site_2.Carrera (CodigoCarrera, Facultad, Nombre) VALUES ('IMT',
'INGENIERIAS', 'MECATRONICA');
INSERT INTO up_site_2.Carrera (CodigoCarrera, Facultad, Nombre) VALUES ('ENI',
'EMPRESARIALES', 'NEGOCIOS INTERNACIONALES');
-- PROFESOR
INSERT INTO up_site_2.Profesor (Profesor, Curriculum, Anios, Calificacion) VALUES
('Victoria Carreras', 'Ingeniero Ciencias Computacionales', '49', '9.8');
INSERT INTO up_site_2.Profesor (Profesor, Curriculum, Anios, Calificacion) VALUES
('Sofia Ortiz', 'DBA', '28', '10');
INSERT INTO up_site_2.Profesor (Profesor, Curriculum, Anios, Calificacion) VALUES
('Christian Coronel', 'Ingeniero TI', '34', '4');
INSERT INTO up_site_2.Profesor (Profesor, Curriculum, Anios, Calificacion) VALUES
('Victor Isolino', 'Filosofo', '40', '8');
INSERT INTO up_site_2.Profesor (Profesor, Curriculum, Anios, Calificacion) VALUES
('Rocio Mateos', 'Medico Pediatra', '45', '10');
INSERT INTO up_site_2.Profesor (Profesor, Curriculum, Anios, Calificacion) VALUES
('Monica Fuentes', 'Dentista', '40', '10');
INSERT INTO up_site_2.Profesor (Profesor, Curriculum, Anios, Calificacion) VALUES
('Juan Pulido', 'Ingeniero Ciberseguridad', '82', '2');
INSERT INTO up_site_2.Profesor (Profesor, Curriculum, Anios, Calificacion) VALUES
('Rodrigo Nieto', 'Abogado', '75', '1');
INSERT INTO up_site_2.Profesor (Profesor, Curriculum, Anios, Calificacion) VALUES
('Diego Trevilla', 'Comunicologo', '30', '7');
INSERT INTO up_site_2.Profesor (Profesor, Curriculum, Anios, Calificacion) VALUES
('Jyaru Lecona', 'Licenciado', '52', '10');
INSERT INTO up_site_2.Profesor (Profesor, Curriculum, Anios, Calificacion) VALUES
('Sara Mateos', 'Directora Ingenierias', '29', '10');
INSERT INTO up_site_2.Profesor (Profesor, Curriculum, Anios, Calificacion) VALUES
('Lorenzo Fuentes', 'Asistente', '35', '9');

-- Materias
INSERT INTO up_site_2.Materias (CodigoMateria, Nombre, Profesor, NumCreditos, Dias,
HoraInicio, HoraFinal) VALUES ('COM01', 'Programacion de Algoritmos', 'Victoria
Carreras', 8, 'LUN-MIER-VIER', '8:30:00', '10:00:00');
INSERT INTO up_site_2.Materias (CodigoMateria, Nombre, Profesor, NumCreditos, Dias,
HoraInicio, HoraFinal) VALUES ('COM03', 'Intro Bases de Datos', 'Sofia Ortiz', 8,
'LUN-MIER-VIER', '8:30:00', '10:00:00');
INSERT INTO up_site_2.Materias (CodigoMateria, Nombre, Profesor, NumCreditos, Dias,
HoraInicio, HoraFinal) VALUES ('COM04', 'Python Básico', 'Christian Coronel', 8,
'LUN-MIER-VIER', '8:30:00', '10:00:00');
INSERT INTO up_site_2.Materias (CodigoMateria, Nombre, Profesor, NumCreditos, Dias,
HoraInicio, HoraFinal) VALUES ('HUM01', 'Ética', 'Victor Isolino', 8, 'LUN-MIER-VIER',
'8:30:00', '10:00:00');
INSERT INTO up_site_2.Materias (CodigoMateria, Nombre, Profesor, NumCreditos, Dias,
```

```
HoraInicio, HoraFinal) VALUES ('MED02', 'Histologia', 'Rocio Mateos', 8,
'LUN-MIER-VIER', '8:30:00', '10:00:00');
INSERT INTO up_site_2.Materias (CodigoMateria, Nombre, Profesor, NumCreditos, Dias,
HoraInicio, HoraFinal) VALUES ('MED01', 'Bioquimica', 'Monica Fuentes', 8,
'LUN-MIER-VIER', '8:30:00', '10:00:00');
INSERT INTO up_site_2.Materias (CodigoMateria, Nombre, Profesor, NumCreditos, Dias,
HoraInicio, HoraFinal) VALUES ('DER01', 'Derecho Penal', 'Rodrigo Nieto', 8,
'LUN-MIER-VIER', '8:30:00', '10:00:00');
INSERT INTO up_site_2.Materias (CodigoMateria, Nombre, Profesor, NumCreditos, Dias,
HoraInicio, HoraFinal) VALUES ('EMPC01', 'Principios de Fotografias', 'Diego Trevilla', 8,
'LUN-MIER-VIER', '8:30:00', '10:00:00');
INSERT INTO up_site_2.Materias (CodigoMateria, Nombre, Profesor, NumCreditos, Dias,
HoraInicio, HoraFinal) VALUES ('EMP02', 'Negocios', 'Jyaru Lecona', 8, 'LUN-MIER-VIER',
'8:30:00', '10:00:00');
INSERT INTO up_site_2.Materias (CodigoMateria, Nombre, Profesor, NumCreditos, Dias,
HoraInicio, HoraFinal) VALUES ('EMP01', 'Competencias Directivas', 'Sara Mateos', 8,
'LUN-MIER-VIER', '8:30:00', '10:00:00');
INSERT INTO up_site_2.Materias (CodigoMateria, Nombre, Profesor, NumCreditos, Dias,
HoraInicio, HoraFinal) VALUES ('HUM02', 'Antropologia Teologica', 'Lorenzo Fuentes', 8,
'LUN-MIER-VIER', '8:30:00', '10:00:00');

INSERT INTO up_site_2.Alumno (ID, Nombre, Correo, Direccion, Numero, Inscrito,
CodigoCarrera, Voluntariado) VALUES ('0212511', 'Lorenzo Reinos',
'0212511@up.edu.mx', 'Mier y Pesado', '5585530054', TRUE, 'IIDC', TRUE);
INSERT INTO up_site_2.Cursa (ID, CodigoMateria, Califiacion) VALUES ('0212511',
'EMP01', 5.5);
INSERT INTO up_site_2.Cursa (ID, CodigoMateria, Califiacion) VALUES ('0212511',
'COM04', 8.0);

INSERT INTO up_site_2.Carrera (CodigoCarrera, Facultad, Nombre) VALUES ('ITI',
'INGENIERIAS', 'Tecnologias de la Información');
INSERT INTO up_site_2.Alumno (ID, Nombre, Correo, Direccion, Numero, Inscrito,
CodigoCarrera, Voluntariado) VALUES ('0234666', 'Juan Manuel Pulido',
'0234666@up.edu.mx', 'Campana 3', '5582400549', TRUE, 'ITI', TRUE);
INSERT INTO up_site_2.Cursa (ID, CodigoMateria, Califiacion) VALUES ('0212511',
'EMP01', 10);
INSERT INTO up_site_2.Cursa (ID, CodigoMateria, Califiacion) VALUES ('0212511',
'COM01', 9.0);
INSERT INTO up_site_2.Cursa (ID, CodigoMateria, Califiacion) VALUES ('0212511',
'EMP02', 9.0);
INSERT INTO up_site_2.Cursa (ID, CodigoMateria, Califiacion) VALUES ('0212511',
'HUM02', 9.5);
INSERT INTO up_site_2.Cursa (ID, CodigoMateria, Califiacion) VALUES ('0212511',
'DER01', 10);
INSERT INTO up_site_2.Cursa (ID, CodigoMateria, Califiacion) VALUES ('0212511',
'EMPC01', 9.1);

INSERT INTO up_site_2.Becas (ID, Beca_SEP, Beca_Academica, Beca_Trabajo,
Beca_Deportiva, Beca_Cultural, Beca_Convenio, Extra, Conserva) VALUES ('0244643', 0,
20, 20, 0, 0, 0, 5, TRUE);
INSERT INTO up_site_2.Becas (ID, Beca_SEP, Beca_Academica, Beca_Trabajo,
Beca_Deportiva, Beca_Cultural, Beca_Convenio, Extra, Conserva) VALUES ('0212504', 0,
20, 20, 0, 0, 0, 5, TRUE);
INSERT INTO up_site_2.Becas (ID, Beca_SEP, Beca_Academica, Beca_Trabajo,
```

```
Beca_Deportiva, Beca_Cultural, Beca_Convenio, Extra, Conserva) VALUES ('0212511', 0,
20, 20, 0, 0, 20, 5, TRUE);
INSERT INTO up_site_2.Becas (ID, Beca_SEP, Beca_Academica, Beca_Trabajo,
Beca_Deportiva, Beca_Cultural, Beca_Convenio, Extra, Conserva) VALUES ('0212500', 0,
20, 20, 0, 0, 0, 5, TRUE);
INSERT INTO up_site_2.Becas (ID, Beca_SEP, Beca_Academica, Beca_Trabajo,
Beca_Deportiva, Beca_Cultural, Beca_Convenio, Extra, Conserva) VALUES ('0234666', 0,
40, 20, 0, 0, 0, 5, TRUE);
INSERT INTO up_site_2.Becas (ID, Beca_SEP, Beca_Academica, Beca_Trabajo,
Beca_Deportiva, Beca_Cultural, Beca_Convenio, Extra, Conserva) VALUES ('0212503', 0,
0, 0, 0, 0, 0, 5, TRUE);
```

SQL Queries

```
--Muestra las becas que tiene un alumno (Lorenzo)
Select A.Nombre, A.id, b.Beca_sep, b.Beca_Academica, b.Beca_Trabajo,
b.Beca_Deportiva, b.Beca_Cultural, b.Beca_Convenio
From up_SITE_2.alumno as A
join up_SITE_2.becas b on A.id = A.id
where A.nombre = 'Lorenzo';

--Muestra el nombre y id del alumno con mayor calificacion de una materia (Calculo)
Select A.nombre, A.id ,C.Califiacion
From up_SITE_2.alumno as A
join up_SITE_2.cursa C on A.id = C.id
join up_SITE_2.materias M on C.codigomateria = M.codigomateria
where M.nombre = 'Calculo'
group by C.Califiacion,A.nombre, A.id;

--Muestra el nombre del profesor con la mayor calificacion de una materia (IBD)
Select P.Profesor, max(E.calificacion)
From up_SITE_2.profesor as P
join up_SITE_2.evaluacion E on P.profesor = E.profesor
join up_SITE_2.materias M on P.profesor = M.profesor
where M.nombre = 'Introduccion a Base de Datos'
group by P.Profesor;

--Muestra todos los alumnos de alguna carrera (Inteligencia de Datos)
Select A.nombre
from up_SITE_2.alumno as A
join up_SITE_2.carrera as C on A.CodigoCarrera = C.codigocarrera
where C.nombre = 'Inteligencia de Datos';


--Muestra a los alumnos con pocas horas de servicio
Select A.nombre, serv.horas
```

```
from up_SITE_2.alumno as A
join up_SITE_2.serviciosocial serv on A.id = serv.id
where serv.horas <= 10;
```

Functions

```
CREATE OR REPLACE FUNCTION calcular_pago(
tipo_Pago VARCHAR(50),
ID_I varchar(200))
        RETURNS float
        LANGUAGE plpgsql
        AS $$
        DECLARE
                beca_total int;
           creditos int;
           pago float;
        BEGIN
           IF (Select B.conserva FROM up_SITE_2.becas B WHERE B.id = ID_I) THEN
              beca_total = (
              SELECT B.beca_academica + B.beca_convenio + B.beca_cultural +
B.beca_deportiva + B.beca_sep + B.beca_trabajo + B.Extra
              From up_SITE_2.becas as B
              Where B.id = ID_I );
           else
                beca_total=0;
           end if;
           creditos = (
              SELECT sum(M.numcreditos)
              FROM up_SITE_2.materias M
              JOIN up_SITE_2.cursa C on M.codigomateria = C.CodigoMateria
              WHERE C.ID = ID_I
        );
           IF (22>creditos>42) THEN
        RAISE NOTICE 'Revisa tus materias tus creditos no son validos. Creditos:
%',creditos;
        Return NULL;
      end if;
           IF tipo_Pago == 'contado' THEN
        beca_total = beca_total + 5;
      end if;
           pago = 2873 * creditos * (beca_total/100);
           IF tipo_Pago == 'contado' THEN
        Raise NOTICE 'Se hará un pago de contado de % y se tiene una beca
del',pago,beca_total;
      else
        pago = pago/5;
              Raise NOTICE 'Se harán 5 un pagos de % y se tiene una beca
del',pago,beca_total;
```

```
end if;

    RETURN pago;
END;
$$;
```

Results and conclusions

By making our own database we found the problems of not having a 100% knowledge of how to make queries, so we started to research and learn more than what we already knew. We managed to work as a team and separate the tasks in an equitable way. We concluded as a team that databases are very useful and can make our processes more efficient. We realized that SQL is a programming language that is very complete because even though it only works for databases it allows us to make functions and optimize processes more efficiently than any other programming language. At the beginning of this project no one was interested in doing the Entity-Relationship diagrams because we saw it as a tedious task so we decided to do this task all together and we realized how easy it was to pass the tables to our query after having our entity-relationship diagrams already done, we discovered that the visual part of the databases even though they do not look very important are the most important part to develop our database.