

Εθνικό Μετσόβιο Πολυτεχνείο

Σχολή Ηλεκτρολόγων Μηχανικών και Μηχανικών Υπολογιστών

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Ομάδα 122



Το Ελληνικό Ίδρυμα Έρευνας και Καινοτομίας - ΕΛ.ΙΔ.Ε.Κ. είναι σημαντικός χρηματοδότης της ακαδημαϊκής έρευνας στην Ελλάδα. Οι ερευνητές υποβάλλουν ετησίως προτάσεις έργων σε διάφορα προγράμματα και αυτό, μέσω διαδικασίας αξιολόγησης, αποφασίζει ποια έργα θα χρηματοδοτηθούν. Αφού χρηματοδοτηθούν τα έργα (τα ποσά κυμαίνονται από 100.000€ έως 1.000.000€), ο οργανισμός που απασχολούνται οι ερευνητές διαχειρίζεται τα χρήματα για λογαριασμό των ερευνητών.

Ο Δ/ντης του ΕΛ.ΙΔ.Ε.Κ. σας κάλεσε να σχεδιάσετε και να υλοποιήσετε ένα σύστημα αποθήκευσης, διαχείρισης και ανάλυσης των πληροφοριών που συγκεντρώνονται από το ίδρυμα.



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Ελληνικό Ίδρυμα Έρευνας & Καινοτομίας

The diagram illustrates the following tables and their attributes:

- RESEARCHER**: ResearcherID (PK), First_Name, Last_Name, Sex, Date_of_Birth, Org_ID (FK), Date_Hired.
- Project**: Project_ID (PK), Start_Date, End_Date, Duration, Funding, Project_Title, Description, Employee_ID (FK), Program_ID (FK), Org_ID (FK), Researcher_ID_Sup (FK), Researcher_ID_Ev (FK), Evaluation, Evaluation_date.
- Organization**: Org_ID (PK), Org_Name, City, Street, Zip_Code, Initials, Organization_type, Equity, Ministry_funds, Private_funds.
- Employee**: Employee_ID (PK), First_Name, Last_Name.
- Program**: Program_ID (PK), Program_Name, Department.
- Research_field**: Project_ID (PK1, FK), Field_Name (PK2).
- Works_On**: Project_ID (PK1, FK1), Researcher_ID (PK2, FK2).
- Org_phone**: Org_ID (PK1, FK), Phone_number (PK2).
- Deliverable**: Project_ID (PK1, FK), Deliverable_ID (PK2), Deliverable_title, Deliverably_summary, Delivery_date.

Relationships are indicated by lines connecting the tables to their respective primary and foreign keys.

1. Σε όλες τις σχέσεις έχει οριστεί ένα primary key για να μπορεί να γίνει σωστή διαχείριση.
2. Ο τύπος όλων των attributes είναι σαφώς ορισμένος.
3. Όλες οι N-1 σχέσεις του ER έχουν μετατραπεί σε attribute (Foreign key).
4. Όλες οι N-N σχέσεις του ER έχουν μετατραπεί σε έναν καινούργιο πίνακα που παραπέμπει στους δύο αρχικούς (πάλι μέσω Foreign key).

Παρακάτω ακολουθούν περιορισμοί που αφορούν του περιορισμούς που τέθηκαν από τον πελάτη και άλλοι λογικοί περιορισμοί:

1. Κάθε έργο έχει έναν οργανισμό που το διαχειρίζεται ο οποίος δεν μπορεί να αλλάξει.
2. Κάθε έργο έχει έναν ερευνητή που είναι ο επιστημονικός υπεύθυνος του.
3. Κάθε έργο έχει ελάχιστη διάρκεια 1 έτος - μέγιστη τα 4 έτη.
4. Το κάθε έργο προκειμένου να χρηματοδοτηθεί έχει αξιολογηθεί από έναν ερευνητή που δεν ανήκει στο δυναμικό του οργανισμού.
5. Τα ποσά χρηματοδότησης κυμαίνονται από 100.000€ έως 1.000.000€.
6. Το κάθε έργο λαμβάνει χρηματοδότηση από ένα πρόγραμμα.
7. Ο κάθε ερευνητής εργάζεται σε ένα (και μόνο) οργανισμό.
8. Το φύλο ενός ερευνητή μπορεί να πάρει τις τιμές 'male', 'female', 'other',

9. Οι οργανισμοί ανήκουν σε μια από τις 3 κατηγορίες:
 - α) Πανεπιστήμια
 - β) Ερευνητικά Κέντρα
 - γ) Εταιρίες
10. Η ημερομηνία έναρξης ενός έργου (start_date) πρέπει χρονικά να είναι πριν από την ημερομηνία λήξης του (end_date)
11. Η αξιολόγηση του έργου μπορεί να έχει τιμές από 0-100.
12. Σε ένα έργο δουλεύουν μόνο ερευνητές του οργανισμού στον οποίο ανήκει το έργο.
13. Ο ερευνητής που αξιολόγησε ένα έργο δεν μπορεί να δουλεύει στον οργανισμό στον οποίο ανήκει το έργο και συνεπώς ούτε να δουλεύει σε αυτό.
14. Κάθε έργο έχει έναν υπάλληλο του ΕΛΙΔΕΚ να το ελέγχει.
15. Ο supervisor κάθε έργου δουλεύει σε αυτό.
16. Όλα τα παραδοτέα πρέπει να υποβληθούν πριν την λήξη του έργου.

Όσα από τα παραπάνω δεν απαιτούν διασχισιακό έλεγχο υλοποιούνται με απλά checks ενώ τα πιο πολύπλοκα με triggers πριν/μετα την εισαγωγή, επικαιροποίηση ή διαγραφή δεδομένων.

Τέλος όσον αφορά τα χαρακτηριστικά των σχέσεων μερικά κρίνονται απαραίτητα για την εισαγωγή του στοιχείου στην βάση (όπως το όνομα ενός οργανισμού) ενώ άλλα δευτερεύοντα (όπως η διεύθυνση τους οργανισμού). Στα πρώτα απαιτούμε να μην γίνεται δεκτή η τιμή "NULL" ενώ στα δεύτερα όχι.

Η υλοποίηση της βάσης έγινε με sql. Ολόκληρος ο κώδικας βρίσκεται ανεβασμένος αλλά στην παρούσα αναφορά θα εξετάσουμε καίρια σημεία του για την επεξήγηση της λύσης μας.

Query για την δημιουργία της βάσης:

```
1 • DROP DATABASE IF EXISTS elidekdb;
2 CREATE DATABASE elidekdb;
3 USE elidekdb;
```

Queries για την δημιουργία των σχέσεων:

```
5 CREATE TABLE program (
6     program_id INT(10) UNSIGNED NOT NULL AUTO_INCREMENT,
7     program_name VARCHAR(90) NOT NULL,
8     department VARCHAR(90) DEFAULT NULL,
9     PRIMARY KEY (program_id));
10
11 CREATE TABLE employee(
12     employee_id INT(10) UNSIGNED NOT NULL AUTO_INCREMENT,
13     first_name VARCHAR(45) NOT NULL,
14     last_name VARCHAR(45) NOT NULL ,
15     PRIMARY KEY (employee_id));
16
17 CREATE TABLE organization(
18     org_id INT(10) UNSIGNED NOT NULL AUTO_INCREMENT,
19     org_name VARCHAR(60) NOT NULL,
20     city VARCHAR(45) NULL,
21     address VARCHAR(45) NULL,
22     zip_code INT(5) NULL,
23     initials VARCHAR(45) NOT NULL,
24     organization_type VARCHAR(15) NOT NULL,
25     ministry_funds INT(12) NULL,
26     private_funds INT(12) NULL,
27     equity INT(12) NULL,
28     constraint has_type check(organization_type in ('Research_Center','Firm','University')),
29     constraint budget check((organization_type='Research_Center' AND equity=NULL) OR (organization_type='University' AND equity=NULL
30 AND private_funds=NULL) OR (organization_type='Firm' AND private_funds=NULL AND ministry_funds=NULL) OR
31 (equity=NULL AND private_funds=NULL AND ministry_funds=NULL)),
32     PRIMARY KEY (org_id)
33 );
34
35
36 CREATE TABLE researcher (
37     researcher_id int(10) UNSIGNED NOT NULL AUTO_INCREMENT,
38     first_name varchar(45) NOT NULL,
39     last_name varchar(45) NOT NULL,
40     sex varchar(6) NOT NULL,
41     constraint sex_value check (sex in ('male', 'female', 'other')),
42     date_of_birth DATE,
43     date_hired DATE,
44     PRIMARY KEY (researcher_id),
45     org_id int(10) UNSIGNED NOT NULL,
46     CONSTRAINT researcher_works_for FOREIGN KEY (org_id) REFERENCES organization (org_id) ON UPDATE CASCADE
47 ) ;
```

```

49 CREATE TABLE project(
50     project_id int(10) unsigned NOT NULL AUTO_INCREMENT,
51     start_date DATE NOT NULL,
52     end_date DATE NOT NULL,
53     CONSTRAINT time_continuity CHECK (start_date < end_date),
54     duration INT(1) NULL,          -- tha to doume
55     CONSTRAINT min_max_dur CHECK (duration>=1 AND duration<=4),
56     funding INT(7) UNSIGNED NOT NULL,
57     CONSTRAINT min_max_fund CHECK (funding>=100000 AND funding <= 1000000),
58     project_title VARCHAR(45),
59     project_description VARCHAR(255),
60     employee_id INT(10) UNSIGNED NOT NULL,
61     program_id INT(10) UNSIGNED NOT NULL,
62     org_id int(10) UNSIGNED NOT NULL,
63     researcher_id_sup INT(10) UNSIGNED NOT NULL,
64     researcher_id_ev INT(10) UNSIGNED NOT NULL,
65     evaluation INT(3) UNSIGNED NOT NULL,
66     CONSTRAINT score CHECK (evaluation >= 0 AND evaluation <= 100),
67     evaluation_date DATE NOT NULL,
68     CONSTRAINT eval_first CHECK (evaluation_date < start_date),
69     CONSTRAINT sup_not_eval CHECK (researcher_id_sup <> researcher_id_ev),
70     CONSTRAINT project_emp_id FOREIGN KEY (employee_id) REFERENCES employee (employee_id) ON UPDATE CASCADE,
71     CONSTRAINT project_prog_id FOREIGN KEY (program_id) REFERENCES program (program_id) ON UPDATE CASCADE,
72     CONSTRAINT project_id_org FOREIGN KEY (org_id) REFERENCES organization (org_id) ON UPDATE CASCADE,
73     CONSTRAINT project_res_sup FOREIGN KEY (researcher_id_sup) REFERENCES researcher (researcher_id) ON UPDATE CASCADE,
74     CONSTRAINT project_res_ev FOREIGN KEY (researcher_id_ev) REFERENCES researcher (researcher_id) ON UPDATE CASCADE,
75     PRIMARY KEY(project_id)
76 );

78 CREATE TABLE research_field(
79     project_id int(10) unsigned NOT NULL AUTO_INCREMENT,
80     CONSTRAINT res_field_id FOREIGN KEY (project_id) REFERENCES project (project_id) ON UPDATE CASCADE on delete cascade,
81     field_name VARCHAR(100),
82     CONSTRAINT pk_research_field PRIMARY KEY (project_id,field_name)
83 );

84
85 CREATE TABLE org_phone(
86     org_id int(10) unsigned not null,
87     constraint phone_org_id foreign key (org_id) references organization (org_id) on update cascade on delete cascade,
88     phone_number char(10) not null,
89     constraint pk_phone primary key (org_id, phone_number)
90 );

92 CREATE TABLE works_on(
93     project_id int(10) unsigned NOT NULL,
94     researcher_id int(10) UNSIGNED NOT NULL,
95     CONSTRAINT works_on_project FOREIGN KEY (project_id) REFERENCES project (project_id) ON UPDATE CASCADE on delete cascade,
96     CONSTRAINT res_works_on FOREIGN KEY (researcher_id) REFERENCES researcher (researcher_id) ON UPDATE CASCADE on delete cascade,
97     CONSTRAINT pk_works_on PRIMARY KEY (project_id,researcher_id)
98 );

99
100 CREATE TABLE deliverable(
101     project_id int(10) unsigned NOT NULL,
102     CONSTRAINT del_project FOREIGN KEY (project_id) REFERENCES project (project_id) ON UPDATE CASCADE on delete cascade,
103     deliverable_id int(10) unsigned NOT NULL AUTO_INCREMENT,
104     deliverable_title VARCHAR(45) NOT NULL,
105     deliverable_summary VARCHAR(255),
106     delivery_date DATE NOT NULL,
107     KEY (deliverable_id),
108     CONSTRAINT pk_delivery PRIMARY KEY (project_id,deliverable_id)
109 );

```

Επιβεβαιώνεται πως κατά την δημιουργία του κάθε πίνακα ορίζονται αυστηρά οι τύποι κάθε χαρακτηριστικού καθώς οι περιορισμοί τους (not null, null, primary key, unsigned).

Ταυτόχρονα ορίζονται και οι απλοί έλεγχοι που πρέπει να κάνει η βάση και αναφέραμε νωρίτερα. Ένα παράδειγμα είναι το “CONSTRAINT time_continuity CHECK (start_date < end_date)” που ελέγχει τον περιορισμό 10.

Τέλος ορίζουμε τα κλειδιά που χρειαζόμαστε για να γίνονται σωστά οι παραπομπές μεταξύ σχέσεων. Προφανώς η σειρά δημιουργίας των σχέσεων είναι τέτοια ώστε να υπάρχουν ήδη οι πίνακες στους οποίους θα αναφέρεται το foreign key.

Ακολουθούν τα constraints που καλύπτουν τους υπόλοιπους κανόνες:

Ο ερευνητής που αξιολόγησε ένα έργο δεν μπορεί να δουλεύει στον οργανισμό στον οποίο ανήκει το έργο και συνεπώς ούτε να δουλεύει σε αυτό.

```
DELIMITER $
CREATE TRIGGER no_insider_evaluators_ins BEFORE INSERT ON project
FOR EACH ROW
BEGIN
    IF ((SELECT COUNT(*) FROM researcher r
        WHERE new.org_id = r.org_id AND r.researcher_id = new.researcher_id_ev ) > 0) THEN
        SIGNAL SQLSTATE '45000'
        SET MESSAGE_TEXT = 'check constraint on project failed - A researcher cannot evaluate a project for their organization';
    END IF;
END$
DELIMITER ;

DELIMITER $
CREATE TRIGGER no_insider_evaluators_upd BEFORE UPDATE ON project
FOR EACH ROW
BEGIN
    IF ((SELECT COUNT(*) FROM researcher r
        WHERE new.org_id = r.org_id AND r.researcher_id = new.researcher_id_ev ) > 0) THEN
        SIGNAL SQLSTATE '45000'
        SET MESSAGE_TEXT = 'check constraint on project failed - A researcher cannot evaluate a project for their organization';
    END IF;
END$
DELIMITER ;
```

Σε ένα έργο δουλεύουν μόνο ερευνητές του οργανισμού στον οποίο ανήκει το έργο.

```
DELIMITER $
CREATE TRIGGER researchers_work_on_their_orgs_projects BEFORE INSERT ON works_on
FOR EACH ROW
BEGIN
    IF ((SELECT COUNT(*) FROM project p join researcher r
        on p.org_id=r.org_id
        WHERE p.project_id = new.project_id AND r.researcher_id = new.researcher_id) <> 1) THEN
        SIGNAL SQLSTATE '45000'
        SET MESSAGE_TEXT = 'check constraint on_works on failed - A researcher is loyal and cannot work on foreign projects';
    END IF;
END$
DELIMITER ;

DELIMITER $
CREATE TRIGGER researchers_work_on_their_orgs_projects_upd BEFORE UPDATE ON works_on
FOR EACH ROW
BEGIN
    IF ((SELECT COUNT(*) FROM project p join researcher r
        on p.org_id=r.org_id
        WHERE p.project_id = new.project_id AND r.researcher_id = new.researcher_id) <> 1) THEN
        SIGNAL SQLSTATE '45000'
        SET MESSAGE_TEXT = 'check constraint on_works on failed - A researcher is loyal and cannot work on foreign projects';
    END IF;
END$
DELIMITER ;
```

Ένας ερευνητής δεν πρέπει να δουλεύει σε κάποιο έργο για να αλλάξει τον οργανισμό που ανήκει. Επίσης δεν μπορεί να μεταφερθεί σε οργανισμό για τον οποίο έχει αξιολογήσει κάποιο έργο.

```

DELIMITER $
CREATE TRIGGER researcher_transfer BEFORE update on researcher
FOR EACH ROW
BEGIN
    IF (new.org_id <> old.org_id and ( (SELECT COUNT(*) FROM works_on WHERE researcher_id = new.researcher_id) > 0 or
(select count(*) from project where org_id = new.org_id and researcher_id_ev = new.researcher_id) > 0)) THEN
        SIGNAL SQLSTATE '45000'
            SET MESSAGE_TEXT = 'check constraint on researcher failed - A researcher has to drop his projects before he swaps org';
    END IF;
END$
DELIMITER ;

```

Κάθε έργο έχει έναν οργανισμό που το διαχειρίζεται ο οποίος δεν μπορεί να αλλάξει.

```

DELIMITER $
CREATE TRIGGER project_belongs_to_org BEFORE update ON project
FOR EACH ROW
BEGIN
    IF ((SELECT COUNT(*) FROM project WHERE old.org_id <> new.org_id) > 0) THEN
        SIGNAL SQLSTATE '45000'
            SET MESSAGE_TEXT = 'check constraint project on failed - the projects organization is unchangeable';
    END IF;
END$
DELIMITER ;

```

Ο παρακάτω trigger χρησιμοποιείται για να υπολογίσει το derived attribute “duration” σε κάθε project.

```

DELIMITER $
CREATE TRIGGER calc_duration_ins before INSERT ON project
FOR EACH ROW
BEGIN
    set new.duration= DATEDIFF(new.end_date, new.start_date) / 365.25 ;
END$
DELIMITER ;

```

```

DELIMITER $
CREATE TRIGGER calc_duration_upd before update ON project
FOR EACH ROW
BEGIN
    set new.duration= DATEDIFF(new.end_date, new.start_date) / 365.25 ;
END$
DELIMITER ;

```


Όλα τα παραδοτέα πρέπει να υποβληθούν πριν την λήξη του έργου.

```
DELIMITER $
CREATE TRIGGER deliver_on_time before insert ON deliverable
FOR EACH ROW
BEGIN
IF ((SELECT COUNT(*) FROM project WHERE project_id = new.project_id AND
(new.delivery_date < start_date OR new.delivery_date > end_date )) > 0) THEN
    SIGNAL SQLSTATE '45000'
        SET MESSAGE_TEXT = 'check constraint on deliverable failed - This is not Back to the Future';
    END IF;
END$
DELIMITER ;
```

```
DELIMITER $
CREATE TRIGGER deliver_on_time_upd before update ON deliverable
FOR EACH ROW
BEGIN
IF ((SELECT COUNT(*) FROM project WHERE project_id = new.project_id AND
(new.delivery_date < start_date OR new.delivery_date > end_date )) > 0) THEN
    SIGNAL SQLSTATE '45000'
        SET MESSAGE_TEXT = 'check constraint on deliverable failed - This is not Back to the Future';
    END IF;
END$
DELIMITER ;
```

Ο supervisor καθε έργου δουλεύει σε αυτό.

```
DELIMITER $
CREATE TRIGGER add_supervisor_works_on_INSERT AFTER INSERT ON project
FOR EACH ROW
> BEGIN
    INSERT INTO works_on (project_id, researcher_id) VALUES (new.project_id, new.researcher_id_sup);
- END$
DELIMITER ;
```

```
DELIMITER $
CREATE TRIGGER add_supervisor_works_on_UPDATE AFTER UPDATE ON project
FOR EACH ROW
> BEGIN
    REPLACE INTO works_on
        SET project_id = new.project_id, researcher_id = new.researcher_id_sup;
- END$
DELIMITER ;
```

Δημιουργούμε επίσης τα δύο views που ζητούνται στο ερώτημα 3.2:

```
DROP VIEW IF EXISTS researchersprojects;
CREATE VIEW researchersprojects AS
select r.researcher_id ,r.first_name, r.last_name, p.project_id, p.project_title
FROM researcher r
INNER JOIN works_on w
ON r.researcher_id = w.researcher_id
INNER JOIN project p
ON p.project_id = w.project_id
ORDER BY r.researcher_id;
```

```
DROP VIEW IF EXISTS organizationsresearchers;
CREATE VIEW organizationsresearchers AS
SELECT r.researcher_id, r.first_name, r.last_name, r.org_id, org.org_name
FROM researcher r
INNER JOIN
organization org
ON r.org_id = org.org_id
ORDER BY r.org_id ASC;
```

Το δεύτερο view εμφανίζει τους researchers (id, ονομα, επίθετο) ανά οργανισμό.

Χρησιμοποιούμε ευρετήρια σε στήλες που χρησιμοποιούνται σε queries συχνά. Μέσω των ευρετηρίων ελαχιστοποιείται ο χρόνος ολοκλήρωσης του query. Η mysql δημιουργεί αυτόματα ευρετήρια στο primary key κάθε σχέσης τα οποία και χρησιμοποιούμε πολύ συχνά. Σε αυτά τα ευρετήρια επιλέγουμε να προσθέσουμε ένα στην στήλη field_name του research_field και ένα στις στήλες start_date και end_date του project που χρησιμοποιούνται για τα αιτήματα του χρήστη.

```
create index idx_field_name on research_field(field_name);
create index idx_projects_start_date on project(start_date);
create index idx_projects_end_date on project(end_date);
create index idx_researcher_org_id on researcher(org_id);
create index idx_project_org_id on project(org_id);
create index idx_project_researcher_id_ev on project(researcher_id_ev);
```

Τέλος εισάγουμε αναληθή δεδομένα (dummy data) στην βάση για να μπορούμε να ελέγξουμε τα queries που ζητούνται στο 3ο ερώτημα αλλά και την υλοποίηση του CRUD.

Για την ανάπτυξη και διαχείριση της βάσης χρησιμοποιήσαμε το DBMS client “mysql workbench”.

Για την δημιουργία του UI που θα επιτυγχάνει την υλοποίηση του CRUD και των ερωτημάτων που ζητούνται χρησιμοποιήσαμε php και html. Ο χρήστης μπορεί να επιλέξει και να ακολουθήσει τις οδηγίες που του δίνονται για να πετύχει το εκάστοτε αίτημα.

Η σύνδεση μεταξύ των δύο επιτυγχάνεται μέσω του Apache Server και την διαχειρίζεται η εφαρμογή xampp control panel.

Για την εγκατάσταση και εκτέλεση της εφαρμογής μας απαιτείται εγκατάσταση της εφαρμογής xampp control panel. Μέσω αυτού ενεργοποιούνται οι υπηρεσίες mysql (port 3306) και apache server (port 80, 443). Επίσης χρειάζεται η λήψη του φακέλου elidekwebapp και τοποθέτησή του στο φάκελο htdocs του xampp.

Τέλος σε κάποιον browser πηγαίνουμε στη διεύθυνση <http://localhost/elidekwebapp>. Ακολουθούν DDL και DML scripts.

```
DROP DATABASE IF EXISTS elidekdb;  
CREATE DATABASE elidekdb;  
USE elidekdb;
```

```
CREATE TABLE program (  
  program_id INT(10) UNSIGNED NOT NULL AUTO_INCREMENT,  
  program_name VARCHAR(90) NOT NULL,  
  department VARCHAR(90) DEFAULT NULL,  
  PRIMARY KEY (program_id));
```

```
CREATE TABLE employee(  
  employee_id INT(10) UNSIGNED NOT NULL AUTO_INCREMENT,  
  first_name VARCHAR(45) NOT NULL,  
  last_name VARCHAR(45) NOT NULL ,  
  PRIMARY KEY (employee_id));
```

```
CREATE TABLE organization (  
  org_id INT(10) UNSIGNED NOT NULL AUTO_INCREMENT,  
  org_name VARCHAR(60) NOT NULL,  
  city VARCHAR(45) NULL,  
  address VARCHAR(45) NULL,  
  zip_code INT(5) NULL,  
  initials VARCHAR(45) NOT NULL,  
  organization_type VARCHAR(15) NOT NULL,  
  ministry_funds INT(12) NULL,  
  private_funds INT(12) NULL,  
  equity INT(12) NULL,  
  constraint has_type check(organization_type in ('Research_Center','Firm','University')),  
  constraint budget check((organization_type='Research_Center' AND equity=NULL) OR  
(organization_type='University' AND equity=NULL  
AND private_funds=NULL) OR (organization_type='Firm' AND private_funds=NULL AND  
ministry_funds=NULL) OR  
(equity=NULL AND private_funds=NULL AND ministry_funds=NULL)),  
  PRIMARY KEY (org_id)  
);
```

```
CREATE TABLE researcher (  
  researcher_id int(10) UNSIGNED NOT NULL AUTO_INCREMENT,  
  first_name varchar(45) NOT NULL,  
  last_name varchar(45) NOT NULL,  
  sex varchar(6) NOT NULL,  
  constraint sex_value check (sex in ('male', 'female', 'other')),  
  date_of_birth DATE,  
  date_hired DATE,  
  PRIMARY KEY (researcher_id),  
  org_id int(10) UNSIGNED NOT NULL,
```

```

    CONSTRAINT researcher_works_for FOREIGN KEY (org_id) REFERENCES organization
(org_id) ON UPDATE CASCADE
);

```

```

CREATE TABLE project(
    project_id int(10) unsigned NOT NULL AUTO_INCREMENT,
    start_date DATE NOT NULL,
    end_date DATE NOT NULL,
    CONSTRAINT time_continuity CHECK (start_date < end_date),
    duration INT(1) NULL,                -- tha to doume
    CONSTRAINT min_max_dur CHECK (duration>=1 AND duration<=4),
    funding INT(7) UNSIGNED NOT NULL,
    CONSTRAINT min_max_fund CHECK (funding>=100000 AND funding <= 1000000),
    project_title VARCHAR(45),
    project_description VARCHAR(255),
    employee_id INT(10) UNSIGNED NOT NULL,
    program_id INT(10) UNSIGNED NOT NULL,
    org_id int(10) UNSIGNED NOT NULL,
    researcher_id_sup INT(10) UNSIGNED NOT NULL,
    researcher_id_ev INT(10) UNSIGNED NOT NULL,
    evaluation INT(3) UNSIGNED NOT NULL,
    CONSTRAINT score CHECK (evaluation >= 0 AND evaluation <= 100),
    evaluation_date DATE NOT NULL,
    CONSTRAINT eval_first CHECK (evaluation_date < start_date),
    CONSTRAINT sup_not_eval CHECK (researcher_id_sup <> researcher_id_ev),
    CONSTRAINT project_emp_id FOREIGN KEY (employee_id) REFERENCES employee
(employee_id) ON UPDATE CASCADE,
    CONSTRAINT project_prog_id FOREIGN KEY (program_id) REFERENCES program
(program_id) ON UPDATE CASCADE,
    CONSTRAINT project_id_org FOREIGN KEY (org_id) REFERENCES organization
(org_id) ON UPDATE CASCADE,
    CONSTRAINT project_res_sup FOREIGN KEY (researcher_id_sup) REFERENCES
researcher (researcher_id) ON UPDATE CASCADE,
    CONSTRAINT project_res_ev FOREIGN KEY (researcher_id_ev) REFERENCES
researcher (researcher_id) ON UPDATE CASCADE,
    PRIMARY KEY(project_id)
);

```

```

CREATE TABLE research_field(
    project_id int(10) unsigned NOT NULL AUTO_INCREMENT,
    CONSTRAINT res_field_id FOREIGN KEY (project_id) REFERENCES project (project_id)
ON UPDATE CASCADE on delete cascade,
    field_name VARCHAR(100),
    CONSTRAINT pk_research_field PRIMARY KEY (project_id,field_name)
);

```

```

CREATE TABLE org_phone(
    org_id int(10) unsigned not null,

```

```
constraint phone_org_id foreign key (org_id) references organization (org_id) on update
cascade on delete cascade,
phone_number char(10) not null,
constraint pk_phone primary key (org_id, phone_number)
);
```

```
CREATE TABLE works_on(
project_id int(10) unsigned NOT NULL,
researcher_id int(10) UNSIGNED NOT NULL,
CONSTRAINT works_on_project FOREIGN KEY (project_id) REFERENCES project
(project_id) ON UPDATE CASCADE on delete cascade,
CONSTRAINT res_works_on FOREIGN KEY (researcher_id) REFERENCES researcher
(researcher_id) ON UPDATE CASCADE on delete cascade,
CONSTRAINT pk_works_on PRIMARY KEY (project_id,researcher_id)
);
```

```
CREATE TABLE deliverable(
project_id int(10) unsigned NOT NULL,
CONSTRAINT del_project FOREIGN KEY (project_id) REFERENCES project (project_id)
ON UPDATE CASCADE on delete cascade,
deliverable_id int(10) unsigned NOT NULL AUTO_INCREMENT,
deliverable_title VARCHAR(45) NOT NULL,
deliverable_summary VARCHAR(255),
delivery_date DATE NOT NULL,
KEY (deliverable_id),
CONSTRAINT pk_delivery PRIMARY KEY (project_id,deliverable_id)
);
```

```
DELIMITER $
CREATE TRIGGER no_insider_evaluators_ins BEFORE INSERT ON project
FOR EACH ROW
BEGIN
    IF ((SELECT COUNT(*) FROM researcher r
        WHERE new.org_id = r.org_id AND
r.researcher_id = new.researcher_id_ev ) > 0) THEN
        SIGNAL SQLSTATE '45000'
        SET MESSAGE_TEXT = 'check constraint on project failed - A researcher cannot
evaluate a project for their organization';
    END IF;
END$
DELIMITER ;
```

```
DELIMITER $
CREATE TRIGGER no_insider_evaluators_upd BEFORE UPDATE ON project
FOR EACH ROW
BEGIN
    IF ((SELECT COUNT(*) FROM researcher r
```

```

WHERE new.org_id = r.org_id AND
r.researcher_id = new.researcher_id_ev ) > 0) THEN
    SIGNAL SQLSTATE '45000'
        SET MESSAGE_TEXT = 'check constraint on project failed - A researcher cannot
evaluate a project for their organization';
    END IF;
END$
DELIMITER ;

```

```

DELIMITER $
CREATE TRIGGER researchers_work_on_their_orgs_projects BEFORE INSERT ON
works_on
FOR EACH ROW
BEGIN
    IF ((SELECT COUNT(*) FROM project p join researcher r
                                                on p.org_id=r.org_id
                                                WHERE p.project_id = new.project_id AND
r.researcher_id = new.researcher_id) <> 1) THEN
        SIGNAL SQLSTATE '45000'
            SET MESSAGE_TEXT = 'check constraint on_works on failed - A researcher is loyal
and cannot work on foreign projects';
        END IF;
    END$
DELIMITER ;

```

```

DELIMITER $
CREATE TRIGGER researchers_work_on_their_orgs_projects_upd BEFORE UPDATE ON
works_on
FOR EACH ROW
BEGIN
    IF ((SELECT COUNT(*) FROM project p join researcher r
                                                on p.org_id=r.org_id
                                                WHERE p.project_id = new.project_id AND
r.researcher_id = new.researcher_id) <> 1) THEN
        SIGNAL SQLSTATE '45000'
            SET MESSAGE_TEXT = 'check constraint on_works on failed - A researcher is loyal
and cannot work on foreign projects';
        END IF;
    END$
DELIMITER ;

```

```

DELIMITER $
CREATE TRIGGER project_belongs_to_org BEFORE update ON project
FOR EACH ROW
BEGIN
    IF ((SELECT COUNT(*) FROM project WHERE old.org_id <> new.org_id) > 0) THEN
        SIGNAL SQLSTATE '45000'

```

```
        SET MESSAGE_TEXT = 'check constraint project on failed - the projects organization
is unchangeable';
    END IF;
END$
DELIMITER ;
```

```
DELIMITER $
CREATE TRIGGER researcher_transfer BEFORE update on researcher
FOR EACH ROW
BEGIN
    IF (new.org_id<>old.org_id and( (SELECT COUNT(*) FROM works_on WHERE
researcher_id = new.researcher_id) > 0 or
    (select count(*) from project where org_id = new.org_id and researcher_id_ev =
new.researcher_id) > 0)) THEN
        SIGNAL SQLSTATE '45000'
        SET MESSAGE_TEXT = 'check constraint on researcher failed - A researcher has to
drop his projects before he swaps org';
    END IF;
END$
DELIMITER ;
```

```
DELIMITER $
CREATE TRIGGER calc_duration_ins before INSERT ON project
FOR EACH ROW
BEGIN
set new.duration= DATEDIFF(new.end_date, new.start_date) / 365.25 ;
END$
DELIMITER ;
```

```
DELIMITER $
CREATE TRIGGER calc_duration_upd before update ON project
FOR EACH ROW
BEGIN
set new.duration= DATEDIFF(new.end_date, new.start_date) / 365.25 ;
END$
DELIMITER ;
```

```
DELIMITER $
CREATE TRIGGER deliver_on_time before insert ON deliverable
FOR EACH ROW
BEGIN
IF ((SELECT COUNT(*) FROM project WHERE project_id = new.project_id AND
(new.delivery_date < start_date OR new.delivery_date > end_date )) > 0) THEN
    SIGNAL SQLSTATE '45000'
    SET MESSAGE_TEXT = 'check constraint on deliverable failed - This is not Back to
the Future';
    END IF;
END$
```


DELIMITER ;

DELIMITER \$

CREATE TRIGGER deliver_on_time_upd before update ON deliverable

FOR EACH ROW

BEGIN

IF ((SELECT COUNT(*) FROM project WHERE project_id = new.project_id AND
(new.delivery_date < start_date OR new.delivery_date > end_date)) > 0) THEN

SIGNAL SQLSTATE '45000'

SET MESSAGE_TEXT = 'check constraint on deliverable failed - This is not Back to
the Future';

END IF;

END\$

DELIMITER ;

DELIMITER \$

CREATE TRIGGER add_supervisor_works_on_INSERT AFTER INSERT ON project

FOR EACH ROW

BEGIN

INSERT INTO works_on (project_id, researcher_id) VALUES (new.project_id,
new.researcher_id_sup);

END\$

DELIMITER ;

DELIMITER \$

CREATE TRIGGER add_supervisor_works_on_UPDATE AFTER UPDATE ON project

FOR EACH ROW

BEGIN

REPLACE INTO works_on

SET project_id = new.project_id, researcher_id = new.researcher_id_sup;

END\$

DELIMITER ;

DROP VIEW IF EXISTS researchersprojects;

CREATE VIEW researchersprojects AS

select r.researcher_id ,r.first_name, r.last_name, p.project_id, p.project_title

FROM researcher r

INNER JOIN works_on w

ON r.researcher_id = w.researcher_id

INNER JOIN project p

ON p.project_id = w.project_id

ORDER BY r.researcher_id;

DROP VIEW IF EXISTS organizationsresearchers;

CREATE VIEW organizationsresearchers AS

SELECT r.researcher_id, r.first_name, r.last_name, r.org_id, org.org_name

FROM researcher r

INNER JOIN

```
organization org
ON r.org_id = org.org_id
ORDER BY r.org_id ASC;
```

```
create index idx_field_name on research_field(field_name);
create index idx_projects_start_date on project(start_date);
create index idx_projects_end_date on project(end_date);
```

```
DROP DATABASE IF EXISTS elidekdb;
CREATE DATABASE elidekdb;
USE elidekdb;
```

```
CREATE TABLE program (
  program_id INT(10) UNSIGNED NOT NULL AUTO_INCREMENT,
  program_name VARCHAR(90) NOT NULL,
  department VARCHAR(90) DEFAULT NULL,
  PRIMARY KEY (program_id));
```

```
CREATE TABLE employee(
  employee_id INT(10) UNSIGNED NOT NULL AUTO_INCREMENT,
  first_name VARCHAR(45) NOT NULL,
  last_name VARCHAR(45) NOT NULL ,
  PRIMARY KEY (employee_id));
```

```
CREATE TABLE organization (
  org_id INT(10) UNSIGNED NOT NULL AUTO_INCREMENT,
  org_name VARCHAR(60) NOT NULL,
  city VARCHAR(45) NULL,
  address VARCHAR(45) NULL,
  zip_code INT(5) NULL,
  initials VARCHAR(45) NOT NULL,
  organization_type VARCHAR(15) NOT NULL,
  ministry_funds INT(12) NULL,
  private_funds INT(12) NULL,
  equity INT(12) NULL,
  constraint has_type check(organization_type in ('Research_Center','Firm','University')),
  constraint budget check((organization_type='Research_Center' AND equity=NULL) OR
(organization_type='University' AND equity=NULL
AND private_funds=NULL) OR (organization_type='Firm' AND private_funds=NULL AND
ministry_funds=NULL) OR
(equity=NULL AND private_funds=NULL AND ministry_funds=NULL)),
  PRIMARY KEY (org_id)
);
```

```
CREATE TABLE researcher (
  researcher_id int(10) UNSIGNED NOT NULL AUTO_INCREMENT,
  first_name varchar(45) NOT NULL,
```

```

last_name varchar(45) NOT NULL,
sex varchar(6) NOT NULL,
constraint sex_value check (sex in ('male', 'female', 'other')),
date_of_birth DATE,
date_hired DATE,
PRIMARY KEY (researcher_id),
org_id int(10) UNSIGNED NOT NULL,
CONSTRAINT researcher_works_for FOREIGN KEY (org_id) REFERENCES organization
(org_id) ON UPDATE CASCADE
);

```

```

CREATE TABLE project(
project_id int(10) unsigned NOT NULL AUTO_INCREMENT,
start_date DATE NOT NULL,
end_date DATE NOT NULL,
CONSTRAINT time_continuity CHECK (start_date < end_date),
duration INT(1) NULL, -- tha to doume
CONSTRAINT min_max_dur CHECK (duration>=1 AND duration<=4),
funding INT(7) UNSIGNED NOT NULL,
CONSTRAINT min_max_fund CHECK (funding>=100000 AND funding <= 1000000),
project_title VARCHAR(45),
project_description VARCHAR(255),
employee_id INT(10) UNSIGNED NOT NULL,
program_id INT(10) UNSIGNED NOT NULL,
org_id int(10) UNSIGNED NOT NULL,
researcher_id_sup INT(10) UNSIGNED NOT NULL,
researcher_id_ev INT(10) UNSIGNED NOT NULL,
evaluation INT(3) UNSIGNED NOT NULL,
CONSTRAINT score CHECK (evaluation >= 0 AND evaluation <= 100),
evaluation_date DATE NOT NULL,
CONSTRAINT eval_first CHECK (evaluation_date < start_date),
CONSTRAINT sup_not_eval CHECK (researcher_id_sup <> researcher_id_ev),
CONSTRAINT project_emp_id FOREIGN KEY (employee_id) REFERENCES employee
(employee_id) ON UPDATE CASCADE,
CONSTRAINT project_prog_id FOREIGN KEY (program_id) REFERENCES program
(program_id) ON UPDATE CASCADE,
CONSTRAINT project_id_org FOREIGN KEY (org_id) REFERENCES organization
(org_id) ON UPDATE CASCADE,
CONSTRAINT project_res_sup FOREIGN KEY (researcher_id_sup) REFERENCES
researcher (researcher_id) ON UPDATE CASCADE,
CONSTRAINT project_res_ev FOREIGN KEY (researcher_id_ev) REFERENCES
researcher (researcher_id) ON UPDATE CASCADE,
PRIMARY KEY(project_id)
);

```

```

CREATE TABLE research_field(
project_id int(10) unsigned NOT NULL AUTO_INCREMENT,

```

```

    CONSTRAINT res_field_id FOREIGN KEY (project_id) REFERENCES project (project_id)
ON UPDATE CASCADE on delete cascade,
    field_name VARCHAR(100),
    CONSTRAINT pk_research_field PRIMARY KEY (project_id,field_name)
);

```

```

CREATE TABLE org_phone(
org_id int(10) unsigned not null,
constraint phone_org_id foreign key (org_id) references organization (org_id) on update
cascade on delete cascade,
phone_number char(10) not null,
constraint pk_phone primary key (org_id, phone_number)
);

```

```

CREATE TABLE works_on(
project_id int(10) unsigned NOT NULL,
researcher_id int(10) UNSIGNED NOT NULL,
CONSTRAINT works_on_project FOREIGN KEY (project_id) REFERENCES project
(project_id) ON UPDATE CASCADE on delete cascade,
CONSTRAINT res_works_on FOREIGN KEY (researcher_id) REFERENCES researcher
(researcher_id) ON UPDATE CASCADE on delete cascade,
CONSTRAINT pk_works_on PRIMARY KEY (project_id,researcher_id)
);

```

```

CREATE TABLE deliverable(
project_id int(10) unsigned NOT NULL,
CONSTRAINT del_project FOREIGN KEY (project_id) REFERENCES project (project_id)
ON UPDATE CASCADE on delete cascade,
deliverable_id int(10) unsigned NOT NULL AUTO_INCREMENT,
deliverable_title VARCHAR(45) NOT NULL,
deliverable_summary VARCHAR(255),
delivery_date DATE NOT NULL,
KEY (deliverable_id),
CONSTRAINT pk_delivery PRIMARY KEY (project_id,deliverable_id)
);

```

```

DELIMITER $
CREATE TRIGGER no_insider_evaluators_ins BEFORE INSERT ON project
FOR EACH ROW
BEGIN
    IF ((SELECT COUNT(*) FROM researcher r
                                         WHERE new.org_id = r.org_id AND
r.researcher_id = new.researcher_id_ev ) > 0) THEN
        SIGNAL SQLSTATE '45000'
        SET MESSAGE_TEXT = 'check constraint on project failed - A researcher cannot
evaluate a project for their organization';
    END IF;

```

```

END$
DELIMITER ;

DELIMITER $
CREATE TRIGGER no_insider_evaluators_upd BEFORE UPDATE ON project
FOR EACH ROW
BEGIN
    IF ((SELECT COUNT(*) FROM researcher r
        WHERE new.org_id = r.org_id AND
        r.researcher_id = new.researcher_id_ev ) > 0) THEN
        SIGNAL SQLSTATE '45000'
        SET MESSAGE_TEXT = 'check constraint on project failed - A researcher cannot
        evaluate a project for their organization';
    END IF;
END$
DELIMITER ;

```

```

DELIMITER $
CREATE TRIGGER researchers_work_on_their_orgs_projects BEFORE INSERT ON
works_on
FOR EACH ROW
BEGIN
    IF ((SELECT COUNT(*) FROM project p join researcher r
        on p.org_id=r.org_id
        WHERE p.project_id = new.project_id AND
        r.researcher_id = new.researcher_id) <> 1) THEN
        SIGNAL SQLSTATE '45000'
        SET MESSAGE_TEXT = 'check constraint on _works on failed - A researcher is loyal
        and cannot work on foreign projects';
    END IF;
END$
DELIMITER ;

```

```

DELIMITER $
CREATE TRIGGER researchers_work_on_their_orgs_projects_upd BEFORE UPDATE ON
works_on
FOR EACH ROW
BEGIN
    IF ((SELECT COUNT(*) FROM project p join researcher r
        on p.org_id=r.org_id
        WHERE p.project_id = new.project_id AND
        r.researcher_id = new.researcher_id) <> 1) THEN
        SIGNAL SQLSTATE '45000'
        SET MESSAGE_TEXT = 'check constraint on _works on failed - A researcher is loyal
        and cannot work on foreign projects';
    END IF;
END$
DELIMITER ;

```

```

DELIMITER $
CREATE TRIGGER project_belongs_to_org BEFORE update ON project
FOR EACH ROW
BEGIN
    IF ((SELECT COUNT(*) FROM project WHERE old.org_id <> new.org_id) > 0) THEN
        SIGNAL SQLSTATE '45000'
        SET MESSAGE_TEXT = 'check constraint project on failed - the projects organization
is unchangeable';
    END IF;
END$
DELIMITER ;

```

```

DELIMITER $
CREATE TRIGGER researcher_transfer BEFORE update on researcher
FOR EACH ROW
BEGIN
    IF (new.org_id<>old.org_id and( (SELECT COUNT(*) FROM works_on WHERE
researcher_id = new.researcher_id) > 0 or
(select count(*) from project where org_id = new.org_id and researcher_id_ev =
new.researcher_id) > 0)) THEN
        SIGNAL SQLSTATE '45000'
        SET MESSAGE_TEXT = 'check constraint on researcher failed - A researcher has to
drop his projects before he swaps org';
    END IF;
END$
DELIMITER ;

```

```

DELIMITER $
CREATE TRIGGER calc_duration_ins before INSERT ON project
FOR EACH ROW
BEGIN
set new.duration= DATEDIFF(new.end_date, new.start_date) / 365.25 ;
END$
DELIMITER ;

```

```

DELIMITER $
CREATE TRIGGER calc_duration_upd before update ON project
FOR EACH ROW
BEGIN
set new.duration= DATEDIFF(new.end_date, new.start_date) / 365.25 ;
END$
DELIMITER ;

```

```

DELIMITER $
CREATE TRIGGER deliver_on_time before insert ON deliverable
FOR EACH ROW
BEGIN

```

```

IF ((SELECT COUNT(*) FROM project WHERE project_id = new.project_id AND
(new.delivery_date < start_date OR new.delivery_date > end_date )) > 0) THEN
    SIGNAL SQLSTATE '45000'
        SET MESSAGE_TEXT = 'check constraint on deliverable failed - This is not Back to
the Future';
    END IF;
END$
DELIMITER ;

```

```

DELIMITER $
CREATE TRIGGER deliver_on_time_upd before update ON deliverable
FOR EACH ROW
BEGIN
IF ((SELECT COUNT(*) FROM project WHERE project_id = new.project_id AND
(new.delivery_date < start_date OR new.delivery_date > end_date )) > 0) THEN
    SIGNAL SQLSTATE '45000'
        SET MESSAGE_TEXT = 'check constraint on deliverable failed - This is not Back to
the Future';
    END IF;
END$
DELIMITER ;

```

```

DELIMITER $
CREATE TRIGGER add_supervisor_works_on_INSERT AFTER INSERT ON project
FOR EACH ROW
BEGIN
    INSERT INTO works_on (project_id, researcher_id) VALUES (new.project_id,
new.researcher_id_sup);
END$
DELIMITER ;

```

```

DELIMITER $
CREATE TRIGGER add_supervisor_works_on_UPDATE AFTER UPDATE ON project
FOR EACH ROW
BEGIN
    REPLACE INTO works_on
        SET project_id = new.project_id, researcher_id = new.researcher_id_sup;
END$
DELIMITER ;

```

```

DROP VIEW IF EXISTS researchersprojects;
CREATE VIEW researchersprojects AS
select r.researcher_id ,r.first_name, r.last_name, p.project_id, p.project_title
FROM researcher r
INNER JOIN works_on w
ON r.researcher_id = w.researcher_id
INNER JOIN project p
ON p.project_id = w.project_id

```

```
ORDER BY r.researcher_id;
```

```
DROP VIEW IF EXISTS organizationsresearchers;  
CREATE VIEW organizationsresearchers AS  
SELECT r.researcher_id, r.first_name, r.last_name, r.org_id, org.org_name  
FROM researcher r  
INNER JOIN  
organization org  
ON r.org_id = org.org_id  
ORDER BY r.org_id ASC;
```

```
create index idx_field_name on research_field(field_name);  
create index idx_projects_start_date on project(start_date);  
create index idx_projects_end_date on project(end_date);
```

```
DROP DATABASE IF EXISTS elidekdb;  
CREATE DATABASE elidekdb;  
USE elidekdb;
```

```
CREATE TABLE program (  
  program_id INT(10) UNSIGNED NOT NULL AUTO_INCREMENT,  
  program_name VARCHAR(90) NOT NULL,  
  department VARCHAR(90) DEFAULT NULL,  
  PRIMARY KEY (program_id));
```

```
CREATE TABLE employee(  
  employee_id INT(10) UNSIGNED NOT NULL AUTO_INCREMENT,  
  first_name VARCHAR(45) NOT NULL,  
  last_name VARCHAR(45) NOT NULL ,  
  PRIMARY KEY (employee_id));
```

```
CREATE TABLE organization (  
  org_id INT(10) UNSIGNED NOT NULL AUTO_INCREMENT,  
  org_name VARCHAR(60) NOT NULL,  
  city VARCHAR(45) NULL,  
  address VARCHAR(45) NULL,  
  zip_code INT(5) NULL,  
  initials VARCHAR(45) NOT NULL,  
  organization_type VARCHAR(15) NOT NULL,  
  ministry_funds INT(12) NULL,  
  private_funds INT(12) NULL,  
  equity INT(12) NULL,  
  constraint has_type check(organization_type in ('Research_Center','Firm','University')),  
  constraint budget check((organization_type='Research_Center' AND equity=NULL) OR  
(organization_type='University' AND equity=NULL  
AND private_funds=NULL) OR (organization_type='Firm' AND private_funds=NULL AND  
ministry_funds=NULL) OR  
(equity=NULL AND private_funds=NULL AND ministry_funds=NULL)),
```



```
PRIMARY KEY (org_id)
);
```

```
CREATE TABLE researcher (
  researcher_id int(10) UNSIGNED NOT NULL AUTO_INCREMENT,
  first_name varchar(45) NOT NULL,
  last_name varchar(45) NOT NULL,
  sex varchar(6) NOT NULL,
  constraint sex_value check (sex in ('male', 'female', 'other')),
  date_of_birth DATE,
  date_hired DATE,
  PRIMARY KEY (researcher_id),
  org_id int(10) UNSIGNED NOT NULL,
  CONSTRAINT researcher_works_for FOREIGN KEY (org_id) REFERENCES organization
(org_id) ON UPDATE CASCADE
);
```

```
CREATE TABLE project(
  project_id int(10) unsigned NOT NULL AUTO_INCREMENT,
  start_date DATE NOT NULL,
  end_date DATE NOT NULL,
  CONSTRAINT time_continuity CHECK (start_date < end_date),
  duration INT(1) NULL,          -- tha to doume
  CONSTRAINT min_max_dur CHECK (duration>=1 AND duration<=4),
  funding INT(7) UNSIGNED NOT NULL,
  CONSTRAINT min_max_fund CHECK (funding>=100000 AND funding <= 1000000),
  project_title VARCHAR(45),
  project_description VARCHAR(255),
  employee_id INT(10) UNSIGNED NOT NULL,
  program_id INT(10) UNSIGNED NOT NULL,
  org_id int(10) UNSIGNED NOT NULL,
  researcher_id_sup INT(10) UNSIGNED NOT NULL,
  researcher_id_ev INT(10) UNSIGNED NOT NULL,
  evaluation INT(3) UNSIGNED NOT NULL,
  CONSTRAINT score CHECK (evaluation >= 0 AND evaluation <= 100),
  evaluation_date DATE NOT NULL,
  CONSTRAINT eval_first CHECK (evaluation_date < start_date),
  CONSTRAINT sup_not_eval CHECK (researcher_id_sup <> researcher_id_ev),
  CONSTRAINT project_emp_id FOREIGN KEY (employee_id) REFERENCES employee
(employee_id) ON UPDATE CASCADE,
  CONSTRAINT project_prog_id FOREIGN KEY (program_id) REFERENCES program
(program_id) ON UPDATE CASCADE,
  CONSTRAINT project_id_org FOREIGN KEY (org_id) REFERENCES organization
(org_id) ON UPDATE CASCADE,
  CONSTRAINT project_res_sup FOREIGN KEY (researcher_id_sup) REFERENCES
researcher (researcher_id) ON UPDATE CASCADE,
```

```
CONSTRAINT project_res_ev FOREIGN KEY (researcher_id_ev) REFERENCES
researcher (researcher_id) ON UPDATE CASCADE,
PRIMARY KEY(project_id)
);
```

```
CREATE TABLE research_field(
project_id int(10) unsigned NOT NULL AUTO_INCREMENT,
CONSTRAINT res_field_id FOREIGN KEY (project_id) REFERENCES project (project_id)
ON UPDATE CASCADE on delete cascade,
field_name VARCHAR(100),
CONSTRAINT pk_research_field PRIMARY KEY (project_id,field_name)
);
```

```
CREATE TABLE org_phone(
org_id int(10) unsigned not null,
constraint phone_org_id foreign key (org_id) references organization (org_id) on update
cascade on delete cascade,
phone_number char(10) not null,
constraint pk_phone primary key (org_id, phone_number)
);
```

```
CREATE TABLE works_on(
project_id int(10) unsigned NOT NULL,
researcher_id int(10) UNSIGNED NOT NULL,
CONSTRAINT works_on_project FOREIGN KEY (project_id) REFERENCES project
(project_id) ON UPDATE CASCADE on delete cascade,
CONSTRAINT res_works_on FOREIGN KEY (researcher_id) REFERENCES researcher
(researcher_id) ON UPDATE CASCADE on delete cascade,
CONSTRAINT pk_works_on PRIMARY KEY (project_id,researcher_id)
);
```

```
CREATE TABLE deliverable(
project_id int(10) unsigned NOT NULL,
CONSTRAINT del_project FOREIGN KEY (project_id) REFERENCES project (project_id)
ON UPDATE CASCADE on delete cascade,
deliverable_id int(10) unsigned NOT NULL AUTO_INCREMENT,
deliverable_title VARCHAR(45) NOT NULL,
deliverable_summary VARCHAR(255),
delivery_date DATE NOT NULL,
KEY (deliverable_id),
CONSTRAINT pk_delivery PRIMARY KEY (project_id,deliverable_id)
);
```

```
DELIMITER $
CREATE TRIGGER no_insider_evaluators_ins BEFORE INSERT ON project
FOR EACH ROW
BEGIN
```

```

IF ((SELECT COUNT(*) FROM researcher r
                                WHERE new.org_id = r.org_id AND
r.researcher_id = new.researcher_id_ev ) > 0) THEN
    SIGNAL SQLSTATE '45000'
        SET MESSAGE_TEXT = 'check constraint on project failed - A researcher cannot
evaluate a project for their organization';
    END IF;
END$
DELIMITER ;

```

```

DELIMITER $
CREATE TRIGGER no_insider_evaluators_upd BEFORE UPDATE ON project
FOR EACH ROW
BEGIN
    IF ((SELECT COUNT(*) FROM researcher r
                                WHERE new.org_id = r.org_id AND
r.researcher_id = new.researcher_id_ev ) > 0) THEN
        SIGNAL SQLSTATE '45000'
            SET MESSAGE_TEXT = 'check constraint on project failed - A researcher cannot
evaluate a project for their organization';
        END IF;
    END$
DELIMITER ;

```

```

DELIMITER $
CREATE TRIGGER researchers_work_on_their_orgs_projects BEFORE INSERT ON
works_on
FOR EACH ROW
BEGIN
    IF ((SELECT COUNT(*) FROM project p join researcher r
                                on p.org_id=r.org_id
                                WHERE p.project_id = new.project_id AND
r.researcher_id = new.researcher_id) <> 1) THEN
        SIGNAL SQLSTATE '45000'
            SET MESSAGE_TEXT = 'check constraint on _works on failed - A researcher is loyal
and cannot work on foreign projects';
        END IF;
    END$
DELIMITER ;

```

```

DELIMITER $
CREATE TRIGGER researchers_work_on_their_orgs_projects_upd BEFORE UPDATE ON
works_on
FOR EACH ROW
BEGIN
    IF ((SELECT COUNT(*) FROM project p join researcher r
                                on p.org_id=r.org_id

```

```

WHERE p.project_id = new.project_id AND
r.researcher_id = new.researcher_id) <> 1) THEN
    SIGNAL SQLSTATE '45000'
        SET MESSAGE_TEXT = 'check constraint on _works on failed - A researcher is loyal
and cannot work on foreign projects';
    END IF;
END$
DELIMITER ;

DELIMITER $
CREATE TRIGGER project_belongs_to_org BEFORE update ON project
FOR EACH ROW
BEGIN
    IF ((SELECT COUNT(*) FROM project WHERE old.org_id <> new.org_id) > 0) THEN
        SIGNAL SQLSTATE '45000'
            SET MESSAGE_TEXT = 'check constraint project on failed - the projects organization
is unchangeable';
    END IF;
END$
DELIMITER ;

DELIMITER $
CREATE TRIGGER researcher_transfer BEFORE update on researcher
FOR EACH ROW
BEGIN
    IF (new.org_id<>old.org_id and( (SELECT COUNT(*) FROM works_on WHERE
researcher_id = new.researcher_id) > 0 or
(select count(*) from project where org_id = new.org_id and researcher_id_ev =
new.researcher_id) > 0)) THEN
        SIGNAL SQLSTATE '45000'
            SET MESSAGE_TEXT = 'check constraint on researcher failed - A researcher has to
drop his projects before he swaps org';
    END IF;
END$
DELIMITER ;

DELIMITER $
CREATE TRIGGER calc_duration_ins before INSERT ON project
FOR EACH ROW
BEGIN
set new.duration= DATEDIFF(new.end_date, new.start_date) / 365.25 ;
END$
DELIMITER ;

DELIMITER $
CREATE TRIGGER calc_duration_upd before update ON project
FOR EACH ROW
BEGIN

```

```
set new.duration= DATEDIFF(new.end_date, new.start_date) / 365.25 ;
END$
DELIMITER ;
```

```
DELIMITER $
CREATE TRIGGER deliver_on_time before insert ON deliverable
FOR EACH ROW
BEGIN
IF ((SELECT COUNT(*) FROM project WHERE project_id = new.project_id AND
(new.delivery_date < start_date OR new.delivery_date > end_date )) > 0) THEN
    SIGNAL SQLSTATE '45000'
        SET MESSAGE_TEXT = 'check constraint on deliverable failed - This is not Back to
the Future';
    END IF;
END$
DELIMITER ;
```

```
DELIMITER $
CREATE TRIGGER deliver_on_time_upd before update ON deliverable
FOR EACH ROW
BEGIN
IF ((SELECT COUNT(*) FROM project WHERE project_id = new.project_id AND
(new.delivery_date < start_date OR new.delivery_date > end_date )) > 0) THEN
    SIGNAL SQLSTATE '45000'
        SET MESSAGE_TEXT = 'check constraint on deliverable failed - This is not Back to
the Future';
    END IF;
END$
DELIMITER ;
```

```
DELIMITER $
CREATE TRIGGER add_supervisor_works_on_INSERT AFTER INSERT ON project
FOR EACH ROW
BEGIN
    INSERT INTO works_on (project_id, researcher_id) VALUES (new.project_id,
new.researcher_id_sup);
END$
DELIMITER ;
```

```
DELIMITER $
CREATE TRIGGER add_supervisor_works_on_UPDATE AFTER UPDATE ON project
FOR EACH ROW
BEGIN
    REPLACE INTO works_on
        SET project_id = new.project_id, researcher_id = new.researcher_id_sup;
END$
DELIMITER ;
```

```
DROP VIEW IF EXISTS researchersprojects;
CREATE VIEW researchersprojects AS
select r.researcher_id ,r.first_name, r.last_name, p.project_id, p.project_title
FROM researcher r
INNER JOIN works_on w
ON r.researcher_id = w.researcher_id
INNER JOIN project p
ON p.project_id = w.project_id
ORDER BY r.researcher_id;
```

```
DROP VIEW IF EXISTS organizationsresearchers;
CREATE VIEW organizationsresearchers AS
SELECT r.researcher_id, r.first_name, r.last_name, r.org_id, org.org_name
FROM researcher r
INNER JOIN
organization org
ON r.org_id = org.org_id
ORDER BY r.org_id ASC;
```

```
create index idx_field_name on research_field(field_name);
create index idx_projects_start_date on project(start_date);
create index idx_projects_end_date on project(end_date);
```

```

INSERT INTO employee (employee_id, first_name, last_name)
VALUES (1, 'Νικόλαος', 'Παπαδόπουλος'),
(2, 'Ιωάννης', 'Γιαννόπουλος'),
(3, 'Χαρίδημος', 'Γεωργίου'),
(4, 'Ευάγγελος', 'Αγγελίδης'),
(5, 'Κρέων', 'Αλιβιζάτος'),
(6, 'Κίρκη', 'Δημαρά'),
(7, 'Ηρα', 'Διαμαντοπούλου'),
(8, 'Λήδα', 'Κατράκη'),
(9, 'Ορέστης', 'Κοφινάς'),
(10, 'Υακίνθη', 'Μυλωνά'),
(11, 'Πάμελα', 'Μυλωνά'),
(12, 'Φαίδρα', 'Πάνου'),
(13, 'Φοίβος', 'Παπαχρήστος'),
(14, 'Φαίδων', 'Σταύρου'),
(15, 'Αδωνης', 'Γεωργιάδης'),
(16, 'Βρασίδης', 'Οικονόμου'),
(17, 'Δημήτριος', 'Θεοδοσίου');

```

```

INSERT INTO program(program_id, program_name, department)
VALUES
(1,'Ε.Σ.Π.Α. 2014-2020','Αναπτυξιακά Προγράμματα'),
(2,'Ε.Σ.Π.Α. 2021-2027','Αναπτυξιακά Προγράμματα'),
(3,'Ορίζοντας 2020','Ευρωπαϊκά Προγράμματα'),
(4,'Ορίζοντας Ελλάδα','Ευρωπαϊκά Προγράμματα'),
(5,'ΠΡΑΣΙΝΟ ΤΑΜΕΙΟ - ΦΥΣΙΚΟ ΠΕΡΙΒΑΛΛΟΝ & ΚΑΙΝΟΤΟΜΕΣ ΔΡΑΣΕΙΣ
2022','Περιβαλλοντικά Προγράμματα'),
(6,'ERASMUS+ 2021-2027','Εκπαιδευτικά Προγράμματα'),
(7,'ΤΑΜΕΙΟ ΕΡΕΥΝΩΝ ΓΙΑ ΑΝΘΡΑΚΑ & ΧΑΛΥΒΑ2021-2027','Περιβαλλοντικά
Προγράμματα'),
(8,'Επιχειρησιακό Πρόγραμμα «ΣΤΕΡΕΑ ΕΛΛΑΔΑ» 2014 – 2020','Αναπτυξιακά
Προγράμματα'),
(9,'Ερευνώ – Δημιουργώ – Καινοτομώ 2018-2020','Αναπτυξιακά Προγράμματα'),
(10,'ΣΥΝΕΡΓΑΣΙΑ 2009 (ΓΓΕΤ)','Τεχνολογικά Προγράμματα'),
(11,'ΣΥΝΕΡΓΑΣΙΑ 2011 (ΓΓΕΤ)','Τεχνολογικά Προγράμματα'),
(12,'International grant by Nokia Corporation','Τεχνολογικά Προγράμματα');

```

```

INSERT INTO organization (org_id, org_name, initials, city, address, zip_code,
organization_type, equity, ministry_funds, private_funds)
VALUES
(1, 'ΕΘΝΙΚΟ ΜΕΤΣΟΒΙΟ ΠΟΛΥΤΕΧΝΕΙΟ', 'ΕΜΠ', 'Αθήνα', 'Ηρώων Πολυτεχνείου 9',
15780, 'University', NULL, 100000, NULL),
(2, 'ΕΘΝΙΚΟ και ΚΑΠΟΔΙΣΤΡΙΑΚΟ ΠΑΝΕΠΙΣΤΗΜΙΟ ΑΘΗΝΩΝ', 'ΕΚΠΑ', 'Αθήνα', 'Κιλκίς 18',
17562, 'University', NULL, 230000, NULL),
(3, 'Πανεπιστήμιο Πειραιώς', 'ΠΑΠΕΙ', 'Πειραιάς', 'Γρηγορίου Λαμπράκη 21', 18534,
'University', NULL, 190000, NULL),

```

(4, 'Stanford University', 'SU', 'Stanford', '450 Jane Stanford Way' , 94305, 'University', NULL, 1900000, NULL),
(5, 'ΑΝΩΝΥΜΗ ΝΑΥΤΙΛΙΑΚΗ ΕΤΑΙΡΙΑ ΚΡΗΤΗΣ Α.Ε.', 'ΑΝΕΚ', 'Χανιά', 'Ασπροποτάμου 47' , 01928, 'Firm', 1209832, NULL, NULL),
(6, 'ΒΙΟΜΗΧΑΝΙΚΑ ΤΕΧΝΙΚΑ ΕΡΓΑ ΒΙΟΤΕΡ Α.Ε.', 'ΒΙΟΤ', 'Θεσσαλονίκη', 'Τσιμισκή 139' , 12328, 'Firm', 198974, NULL, NULL),
(7, 'ΒΟΓΙΑΤΖΟΓΛΟΥ SYSTEMS Α.Ε.', 'ΒΟΣΥΣ', 'Αθήνα', 'Ιωνίας 103' , 29871, 'Firm', 875382, NULL, NULL),
(8, 'JUMBO ΑΝΩΝΥΜΗ ΕΜΠΟΡΙΚΗ ΕΤΑΙΡΙΑ', 'ΜΠΕΛΑ', 'Αθήνα', 'Θέμου Ανίνου 17' , 87216, 'Firm', 97543, NULL, NULL),
(9, 'Π.Γ. ΝΙΚΑΣ Α.Β.Ε.Ε.', 'ΝΙΚΑΣ', 'Κόρινθος', 'Ελευθερίου Βενιζέλου 26' , 73460, 'Firm', 238193, NULL, NULL),
(10, 'Logismos ΣΥΣΤΗΜΑΤΑ ΠΛΗΡΟΦΟΡΙΚΗΣ Α.Ε.', 'ΛΟΓΟΣ', 'Πάτρα', 'Μουργκάνας 6' , 17343, 'Firm', 347432, NULL, NULL),
(11, 'ΠΑΠΟΥΤΣΑΝΗΣ ΑΒΕΕ ΚΑΤΑΝΑΛΩΤΙΚΩΝ ΑΓΑΘΩΝ', 'ΠΑΠ', 'Καλαμάτα', 'Ρόδου 13' , 98312, 'Firm', 693511, NULL, NULL),
(12, 'ΦΙΕΡΑΤΕΞ ΑΦΟΙ ΑΝΕΖΟΥΛΑΚΗ Α.Ε.', 'ΦΙΕΡ', 'Ρέθυμνο', 'Θράκης 24' , 67890, 'Firm', 65139, NULL, NULL),
(13, 'LAVIPHARM Α.Ε.', 'ΛΑΒΙ', 'Κωνσταντινούπολη', 'Αγίας Σοφίας 78' , 69213, 'Firm', 881291, NULL, NULL),
(14, 'ΙΝΤΕΡΤΕΚ Α.Ε. ΔΙΕΘΝΕΙΣ ΤΕΧΝ/ΓΙΕΣ', 'ΙΝΤΕΤ', 'Καμπούλ', 'Νήσου Ρω 16' , 17562, 'Firm', 52182, NULL, NULL),
(15, 'ΝΟΒΑΛ ΠΡΟΠΕΡΤΥ ΑΕΕΑΠ', 'ΝΟΒΑΛΟ1', 'Τζακάρτα', 'Κουμουνδούρου 96Α' , 15565, 'Firm', 744190, NULL, NULL),
(16, 'ΕΛΒΑΛΧΑΛΚΟΡ ΕΛΛΗΝΙΚΗ ΒΙΟΜΗΧΑΝΙΑ ΧΑΛΚΟΥ ΚΑΙ ΑΛΟΥΜΙΝΙΟΥ Α.Ε.', 'ΕΛΧΑ', 'Όσλο', 'Τσισάνη 38' , 91711, 'Firm', 98127, NULL, NULL),
(17, 'ΠΑΕ ΠΑΝΑΘΗΝΑΪΚΟΣ', 'ΠΑΟ', 'Αθήνα', 'Λεωφόρος Κηφισίας 296' , 16902, 'Firm', 500135000, NULL, NULL),
(18, 'BRIQ PROPERTIES Α.Ε.Ε.Α.Π.', 'ΜΠΡΙΚ', 'Πρέβεζα', 'Σούδας 16' , 76223, 'Firm', 100639, NULL, NULL),
(19, 'ΕΛΤΟΝ ΔΙΕΘΝΟΥΣ ΕΜΠΟΡΙΟΥ ΑΕΒΕ', 'ΕΛΤΟΝ', 'Πεκίνο', 'Αιγαίου 27' , 12345, 'Firm', 30071, NULL, NULL),
(20, 'ΟΡΓΑΝΙΣΜΟΣ ΠΡΟΓΝΩΣΤΙΚΩΝ ΑΓΩΝΩΝ ΠΟΔΟΣΦΑΙΡΟΥ Α.Ε.', 'ΟΠΑΠ', 'Μπραζίλια', 'Κυπρίων Αγωνιστών 47' , 83998, 'Firm', 150098, NULL, NULL),
(21, 'ΔΗΜΟΣΙΑ ΕΠΙΧΕΙΡΗΣΗ ΗΛΕΚΤΡΙΣΜΟΥ ΑΕ', 'ΔΕΗ', 'Βερολίνο', 'Θεμιστοκλέους 36' , 27499, 'Firm', 2000473, NULL, NULL),
(22, 'ΑΛΡΗΑ ΥΠΗΡΕΣΙΩΝ ΚΑΙ ΣΥΜΜΕΤΟΧΩΝ ΑΝΩΝΥΜΗ ΕΤΑΙΡΕΙΑ', 'ΑΛΦΑ', 'Κομοτηνή', 'Παναγιώτου Ασημακοπούλου 3' , 19223, 'Firm', 500821, NULL, NULL),
(23, 'EUROBANK ΕΡΓΑΣΙΑΣ ΥΠΗΡΕΣΙΩΝ ΚΑΙ ΣΥΜΜΕΤΟΧΩΝ Α.Ε.', 'ΕΥΡΩΒ', 'Αγρίνιο', 'Καλαμακίου 10' , 44028, 'Firm', 664827, NULL, NULL),
(24, 'ΕΛ. Δ. ΜΟΥΖΑΚΗΣ Α.Ε.Β.Ε.Μ. & Ε.', 'ΜΟΥΖΚ', 'Ακράτα', 'Ακροπόλεως 10' , 88721, 'Firm', 9902, NULL, NULL),
(25, 'ΙΝΤΡΑΚΟΜ Α.Ε. ΣΥΜΜΕΤΟΧΩΝ', 'ΙΝΤΚΑ', 'Φιλιατρά', 'Νηρηίδων 13' , 76223, 'Firm', 100639, NULL, NULL),
(26, 'ΑΡΤΟΒΙΟΜΗΧΑΝΙΑ ΚΑΡΑΜΟΛΕΓΚΟΣ Α.Ε.', 'ΚΜΟΛ', 'Χαλκίδα', 'Αρτάκης 32' , 11223, 'Firm', 5000, NULL, NULL),
(27, 'Smithsonian Environmental Research Center', 'SERC', 'Καρδίτσα', 'Λήμνου 46' , 92381, 'Research_Center', NULL, 100000, 200000),


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(28, 'Texas A&M AgriLife Research', 'TAMAR', 'Χίουστον', 'Wall St 99' , 17771,
'Research_Center', NULL, 34022, 9900),
(29, 'Pew Research Center', 'PEWRC', 'Λονδίνο', 'Ναυάρχου Βότση 13' , 88277,
'Research_Center', NULL, 13920, 6700),
(30, 'Wellcome Trust Sanger Institute ', 'WTSI', 'Λάρισα', 'Αγίου Δημητρίου 44' , 08318,
'Research_Center', NULL, 771329, 10000)
;
-- res_org_id:prwtoi 10 sto noumero tous, mexri 69 sto noumero tw n dekadwn, meta tyxaia,
id=100 default evaluator
INSERT INTO researcher (researcher_id, first_name, last_name, sex, date_of_birth,
date_hired, org_id)
VALUES
(1, 'Giannis', 'Antetokoumbo', 'Male', '1998-12-17', '2021-05-17', 1),
(2, 'Maria', 'DB', 'Female', '1997-12-17', '2021-06-20', 2),
(3, 'Stefanos', 'Tsitsipas', 'Other', '1995-06-10', '2021-06-20', 3),
(4, 'Tania', 'Sawny', 'Female', '1940-07-12', '2021-11-07', 4),
(5, 'Walton', 'Deinhardt', 'Male', '1999-09-29', '2014-03-11', 5),
(6, 'Antony', 'Riggert', 'Male', '1932-06-11', '2014-07-21', 6),
(7, 'Doe', 'Woolfenden', 'Female', '1973-09-18', '2002-07-17', 7),
(8, 'Tommie', 'Hampson', 'Male', '1928-12-25', '2012-11-12', 8),
(9, 'Adina', 'Draycott', 'Female', '1938-06-28', '2002-06-06', 9),
(10, 'Erin', 'Lytell', 'Female', '1959-07-09', '2012-11-09', 1),
(11, 'Zarah', 'Pietri', 'Female', '1959-01-28', '2020-12-23', 1),
(12, 'Maria', 'Sakkari', 'Female', '1993-02-12', '2021-06-20', 1),
(13, 'Anstice', 'Spellard', 'Female', '1981-08-13', '2009-08-04', 1),
(14, 'North', 'Madsen', 'Male', '1945-09-19', '2013-06-11', 1),
(15, 'Ransom', 'Gawne', 'Male', '1985-01-13', '2012-07-21', 1),
(16, 'Leisha', 'Billinge', 'Female', '1923-09-09', '2019-04-30', 1),
(17, 'Renee', 'Mackro', 'Female', '1976-06-02', '2015-02-02', 1),
(18, 'Gena', 'Lago', 'Female', '1998-08-27', '2015-11-11', 1),
(19, 'Nana', 'Libby', 'Female', '1951-05-18', '2001-06-14', 1),
(20, 'Clayson', 'Nester', 'Male', '1987-01-07', '2018-03-24', 2),
(21, 'Cornall', 'Hartland', 'Male', '1997-07-15', '2020-12-24', 2),
(22, 'Darby', 'Shanahan', 'Female', '1982-10-12', '2010-01-04', 2),
(23, 'Melita', 'Allot', 'Female', '1965-06-21', '2010-01-02', 2),
(24, 'Vernor', 'Rodden', 'Male', '1967-12-23', '2001-12-03', 2),
(25, 'Gusti', 'Coombs', 'Female', '1969-12-05', '2013-02-24', 2),
(26, 'Izaak', 'Godilington', 'Other', '1990-12-10', '2002-01-28', 2),
(27, 'Constantin', 'Clurow', 'Male', '1984-05-12', '2006-07-14', 2),
(28, 'Yolande', 'Lordon', 'Female', '1930-04-12', '2010-09-14', 2),
(29, 'Bartie', 'Klimsch', 'Other', '1940-05-08', '2019-08-16', 2),
(30, 'Killian', 'Coombes', 'Other', '1924-06-20', '2016-01-03', 3),
(31, 'Dominica', 'Toplin', 'Female', '1945-08-27', '2013-07-30', 3),
(32, 'Antonetta', 'Cosins', 'Female', '1924-08-08', '2015-01-01', 3),
(33, 'Merilyn', 'Lothead', 'Female', '1993-11-12', '2007-06-22', 3),
(34, 'Miguelita', 'Buckbee', 'Female', '1983-01-27', '2009-01-26', 3),
(35, 'Reggi', 'Whitcombe', 'Female', '1941-06-16', '2005-08-28', 3),
(36, 'Griffie', 'Verissimo', 'Male', '1935-07-08', '2001-04-04', 3),

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(37,'Dionisio', 'Strathearn', 'Male', '1983-11-29', '2010-07-08', 3),
(38,'Peggi', 'O"Shevlan', 'Female', '1991-12-07', '2017-11-17', 3),
(39,'Timi', 'Bysouth', 'Female', '1971-05-27', '2008-04-20', 3),
(40,'Tallie', 'Waldera', 'Female', '1941-11-29', '2004-08-28', 4),
(41,'Rem', 'Windas', 'Male', '1989-08-10', '2008-08-17', 4),
(42,'Arnaldo', 'Easton', 'Male', '1958-08-19', '2012-08-24', 4),
(43,'Antonina', 'Meany', 'Female', '1989-02-20', '2009-06-18', 4),
(44,'Alejoa', 'Riddles', 'Male', '1941-10-30', '2010-06-17', 4),
(45,'Redd', 'McGurk', 'Male', '1994-12-15', '2014-03-20', 4),
(46,'Jaime', 'Farron', 'Female', '1938-12-04', '2006-02-13', 4),
(47,'Arthur', 'Calloway', 'Male', '1924-08-08', '2014-12-28', 4),
(48,'Addie', 'Svanini', 'Male', '1973-10-08', '2004-11-11', 4),
(49,'Sandy', 'Carbry', 'Female', '1974-03-30', '2005-01-27', 4),
(50,'Fallon', 'Beldon', 'Female', '1984-01-31', '2007-08-17', 5),
(51,'Meta', 'Darrigrand', 'Female', '1926-07-09', '2017-07-30', 5),
(52,'Ravid', 'Grimwood', 'Other', '1985-11-26', '2004-11-07', 5),
(53,'Oates', 'Richichi', 'Male', '1931-03-03', '2008-03-06', 5),
(54,'Austen', 'Bisco', 'Male', '1964-03-30', '2006-01-17', 5),
(55,'Melantha', 'Rigglesford', 'Female', '1973-12-10', '2002-06-14', 5),
(56,'Micheal', 'Vedyashkin', 'Male', '1980-11-07', '2010-02-01', 5),
(57,'Colleen', 'Radcliffe', 'Female', '1960-02-27', '2015-11-28', 5),
(58,'Joelle', 'Cowley', 'Female', '1934-01-22', '2019-06-17', 5),
(59,'Zaccaria', 'Sibary', 'Male', '1969-01-14', '2002-01-10', 5),
(60,'Justinn', 'Jacmar', 'Female', '1993-03-03', '2001-12-01', 6),
(61,'Alejandrina', 'Timewell', 'Female', '1987-12-17', '2019-09-30', 6),
(62,'Sydney', 'Moylan', 'Male', '1957-11-08', '2016-03-24', 6),
(63,'Phyllys', 'Borrowman', 'Female', '1983-09-28', '2008-08-23', 6),
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insert into research_field (field_name, project_id) values ('HUMAN GENETICS', 36);
insert into research_field (field_name, project_id) values ('ANTHROPOLOGY', 48);
insert into research_field (field_name, project_id) values ('ASTROPHYSICS', 49);
insert into research_field (field_name, project_id) values ('APPLIED MATHEMATICS', 35);
insert into research_field (field_name, project_id) values ('MATERIALS ENGINEERING', 16);
insert into research_field (field_name, project_id) values ('ASTROPHYSICS', 20);
insert into research_field (field_name, project_id) values ('ENTOMOLOGY', 2);
insert into research_field (field_name, project_id) values ('ENTOMOLOGY', 6);
insert into research_field (field_name, project_id) values ('ANTHROPOLOGY', 2);
insert into research_field (field_name, project_id) values ('ENTOMOLOGY', 17);
insert into research_field (field_name, project_id) values ('ORGANIC CHEMISTRY', 31);
insert into research_field (field_name, project_id) values ('MATERIALS ENGINEERING', 46);
insert into research_field (field_name, project_id) values ('APPLIED MATHEMATICS', 7);
insert into research_field (field_name, project_id) values ('ORGANIC CHEMISTRY', 54);
insert into research_field (field_name, project_id) values ('ECONOMICS', 46);
insert into research_field (field_name, project_id) values ('COMPUTER SCIENCES', 18);
insert into research_field (field_name, project_id) values ('ASTROPHYSICS', 28);
insert into research_field (field_name, project_id) values ('ANTHROPOLOGY', 6);
insert into research_field (field_name, project_id) values ('ASTROPHYSICS', 21);
insert into research_field (field_name, project_id) values ('ECONOMICS', 21);
insert into research_field (field_name, project_id) values ('ENTOMOLOGY', 27);
insert into research_field (field_name, project_id) values ('ORGANIC CHEMISTRY', 21);
insert into research_field (field_name, project_id) values ('MATERIALS ENGINEERING', 38);
insert into research_field (field_name, project_id) values ('ASTROPHYSICS', 42);
insert into research_field (field_name, project_id) values ('COMPUTER SCIENCES', 8);
insert into research_field (field_name, project_id) values ('ENTOMOLOGY', 24);
insert into research_field (field_name, project_id) values ('MATERIALS ENGINEERING', 34);
insert into research_field (field_name, project_id) values ('MATERIALS ENGINEERING', 1);
insert into research_field (field_name, project_id) values ('MATERIALS ENGINEERING', 30);
insert into research_field (field_name, project_id) values ('HUMAN GENETICS', 55);
insert into research_field (field_name, project_id) values ('ECONOMICS', 31);
insert into research_field (field_name, project_id) values ('ANTHROPOLOGY', 23);
insert into research_field (field_name, project_id) values ('APPLIED MATHEMATICS', 23);


```

insert into research_field (field_name, project_id) values ('COMPUTER SCIENCES', 23);
insert into research_field (field_name, project_id) values ('MATERIALS ENGINEERING', 6);
insert into research_field (field_name, project_id) values ('ORGANIC CHEMISTRY', 38);
insert into research_field (field_name, project_id) values ('ASTROPHYSICS', 50);
insert into research_field (field_name, project_id) values ('HUMAN GENETICS', 21);
insert into research_field (field_name, project_id) values ('ASTROPHYSICS', 23);
insert into research_field (field_name, project_id) values ('HUMAN GENETICS', 53);
insert into research_field (field_name, project_id) values ('ANTHROPOLOGY', 13);
insert into research_field (field_name, project_id) values ('ASTROPHYSICS', 30);
insert into research_field (field_name, project_id) values ('ASTROPHYSICS', 17);
insert into research_field (field_name, project_id) values ('ENTOMOLOGY', 49);
insert into research_field (field_name, project_id) values ('ANTHROPOLOGY', 1);

```

```

INSERT INTO deliverable (project_id, deliverable_title, delivery_date)
VALUES

```

```

(38,'xx', '2024-10-09'),
(47,'xx', '2022-06-01'),
(19,'xx', '2020-03-24'),
(20,'xx', '2023-11-17'),
(38,'xx', '2025-02-14'),
(33,'xx', '2021-12-21'),
(37,'xx', '2022-05-26'),
(22,'xx', '2021-10-13'),
(33,'xx', '2022-08-07'),
(20,'xx', '2023-01-23'),
(14,'xx', '2024-06-02'),
(45,'xx', '2019-12-05')
;

```

```

insert into org_phone (org_id, phone_number) values (30, 7418445624),(30,
7516188912),(11, 4563737283),(16, 3333263288)
,(8, 1029284520),(13, 6950493388),(9, 2176682443),(17, 1151036952),(9,
6512300934),(22, 4200793473),(3, 7083927766)
,(4, 1977765414),(5, 1695111109),(17, 9610683299),(29, 3131304808),(11,
3062377906),(28, 8739473218),(9, 6047065368)
,(5, 6478977002),(11, 9767553033),(20, 6697057393),(14, 7862870353),(11,
9059165347),(4, 8863146958),(23, 5216223507)
,(26, 6778434133),(4, 2298357123),(17, 3813381760),(23, 2019355728),(25,
5335660794),(13, 3342504626),(2, 7059496767)
,(24, 4497188502),(7, 1674248463),(6, 8565985481),(16, 9934056280),(8,
1383231924),(18, 1362418717),(23, 8729382957)
,(17, 5132641015),(16, 9698133776),(20, 6714893770),(13, 2960156308),(17,
2570115924),(18, 1349528118),(21, 5518798490)
,(10, 5752417536),(24, 7086076488),(10, 2528367113),(18, 4081246454),(27,
3075062960),(13, 7859176560),(6, 6568099863)
,(21, 5085320239),(29, 1434245603),(25, 8915868303),(9, 9411619681),(1,
7296198313),(2, 2192559548),(25, 5038991717)

```

, (12, 6833509626),(27, 7074624239),(4, 7796751069),(20, 4391137289),(23, 6967291032),
(5, 2798709761),(27, 7031038547)
,(18, 2669960419),(12, 3212268326),(14, 4279706755),(26, 4603704352),(6,
8778576043),(5, 3561377537), (12, 8303019829)
,(16, 1608357081),(3, 5638576909),(20, 2718837665),(14, 4556879981),(9,
3442261704),(12, 2961969125),(10, 5244548926)
,(28, 1280387573),(12, 5959043084),(19, 2185611831),(19, 9928970588),(20,
8806996121),(8, 5414214757),(7, 9023465653)
,(14, 7488718870),(8, 4960956820),(8, 9198527848),(19, 3186270557),(20, 8375224029);

UPDATE project set project_title = 'metus aenean fermentum' WHERE project_id=1;
UPDATE project set project_title = 'in' WHERE project_id=2;
UPDATE project set project_title = 'habitasse' WHERE project_id=3;
UPDATE project set project_title = 'at nunc commodo' WHERE project_id=4;
UPDATE project set project_title = 'penatibus et magnis' WHERE project_id=5;
UPDATE project set project_title = 'enim' WHERE project_id=6;
UPDATE project set project_title = 'amet turpis' WHERE project_id=7;
UPDATE project set project_title = 'dapibus at' WHERE project_id=8;
UPDATE project set project_title = 'luctus nec' WHERE project_id=9;
UPDATE project set project_title = 'sit amet nunc' WHERE project_id=10;
UPDATE project set project_title = 'primis' WHERE project_id=11;
UPDATE project set project_title = 'praesent blandit nam' WHERE project_id=12;
UPDATE project set project_title = 'amet cursus id' WHERE project_id=13;
UPDATE project set project_title = 'vitae mattis' WHERE project_id=14;
UPDATE project set project_title = 'volutpat eleifend' WHERE project_id=15;
UPDATE project set project_title = 'felis eu' WHERE project_id=16;
UPDATE project set project_title = 'morbi quis' WHERE project_id=17;
UPDATE project set project_title = 'imperdiet nullam orci' WHERE project_id=18;
UPDATE project set project_title = 'id' WHERE project_id=19;
UPDATE project set project_title = 'lacinia' WHERE project_id=20;
UPDATE project set project_title = 'rhoncus aliquam' WHERE project_id=21;
UPDATE project set project_title = 'turpis enim blandit' WHERE project_id=22;
UPDATE project set project_title = 'ultrices posuere cubilia' WHERE project_id=23;
UPDATE project set project_title = 'amet' WHERE project_id=24;
UPDATE project set project_title = 'condimentum' WHERE project_id=25;
UPDATE project set project_title = 'cursus' WHERE project_id=26;
UPDATE project set project_title = 'bibendum morbi non' WHERE project_id=27;
UPDATE project set project_title = 'eu massa donec' WHERE project_id=28;
UPDATE project set project_title = 'nunc viverra' WHERE project_id=29;
UPDATE project set project_title = 'vestibulum aliquet' WHERE project_id=30;
UPDATE project set project_title = 'pretium iaculis' WHERE project_id=31;
UPDATE project set project_title = 'enim' WHERE project_id=32;
UPDATE project set project_title = 'egestas' WHERE project_id=33;
UPDATE project set project_title = 'lacinia sapien quis' WHERE project_id=34;
UPDATE project set project_title = 'pede posuere' WHERE project_id=35;
UPDATE project set project_title = 'nulla tempus vivamus' WHERE project_id=36;
UPDATE project set project_title = 'quis' WHERE project_id=37;

UPDATE project set project_title = 'aliquam augue' WHERE project_id=38;
UPDATE project set project_title = 'vel accumsan' WHERE project_id=39;
UPDATE project set project_title = 'ullamcorper augue' WHERE project_id=40;
UPDATE project set project_title = 'non' WHERE project_id=41;
UPDATE project set project_title = 'pretium quis' WHERE project_id=42;
UPDATE project set project_title = 'magna' WHERE project_id=43;
UPDATE project set project_title = 'eu magna vulputate' WHERE project_id=44;
UPDATE project set project_title = 'scelerisque' WHERE project_id=45;
UPDATE project set project_title = 'id luctus nec' WHERE project_id=46;
UPDATE project set project_title = 'lacus morbi' WHERE project_id=47;
UPDATE project set project_title = 'donec semper sapien' WHERE project_id=48;
UPDATE project set project_title = 'nam congue risus' WHERE project_id=49;
UPDATE project set project_title = 'nunc vestibulum' WHERE project_id=50;
UPDATE project set project_title = 'parturient montes nascetur' WHERE project_id=51;
UPDATE project set project_title = 'vel dapibus at' WHERE project_id=52;
UPDATE project set project_title = 'eu felis fusce' WHERE project_id=53;
UPDATE project set project_title = 'risus dapibus augue' WHERE project_id=54;
UPDATE project set project_title = 'vestibulum ac est' WHERE project_id=55;

UPDATE project set project_description = 'phasellus sit amet erat nulla tempus vivamus in felis eu sapien' WHERE project_id=1;
UPDATE project set project_description = 'eu mi nulla ac enim in tempor turpis nec euismod scelerisque quam turpis' WHERE project_id=2;
UPDATE project set project_description = 'convallis nulla neque libero convallis eget eleifend luctus ultricies eu' WHERE project_id=3;
UPDATE project set project_description = 'nulla facilisi cras non velit nec nisi vulputate nonummy' WHERE project_id=4;
UPDATE project set project_description = 'libero nam dui proin leo odio porttitor id consequat in consequat' WHERE project_id=5;
UPDATE project set project_description = 'pede justo lacinia eget tincidunt eget tempus vel pede morbi porttitor lorem id ligula' WHERE project_id=6;
UPDATE project set project_description = 'magna ac consequat metus sapien ut nunc vestibulum' WHERE project_id=7;
UPDATE project set project_description = 'adipiscing molestie hendrerit at vulputate vitae nisl aenean' WHERE project_id=8;
UPDATE project set project_description = 'molestie nibh in lectus pellentesque at nulla suspendisse potenti cras in purus eu magna' WHERE project_id=9;
UPDATE project set project_description = 'non velit donec diam neque vestibulum eget vulputate ut ultrices vel augue vestibulum' WHERE project_id=10;
UPDATE project set project_description = 'in hac habitasse platea dictumst maecenas ut massa' WHERE project_id=11;
UPDATE project set project_description = 'morbi vestibulum velit id pretium iaculis diam' WHERE project_id=12;
UPDATE project set project_description = 'bibendum imperdiet nullam orci pede venenatis non sodales sed tincidunt' WHERE project_id=13;
UPDATE project set project_description = 'vestibulum sagittis sapien cum sociis natoque penatibus et magnis dis parturient montes nascetur ridiculus' WHERE project_id=14;

UPDATE project set project_description = 'pede lobortis ligula sit amet eleifend pede libero quis orci nullam molestie' WHERE project_id=15;

UPDATE project set project_description = 'cubilia curae mauris viverra diam vitae quam' WHERE project_id=16;

UPDATE project set project_description = 'at ipsum ac tellus semper interdum mauris ullamcorper purus sit amet nulla' WHERE project_id=17;

UPDATE project set project_description = 'ridiculus mus etiam vel augue vestibulum' WHERE project_id=18;

UPDATE project set project_description = 'convallis dui consequat dui nec' WHERE project_id=19;

UPDATE project set project_description = 'rhoncus sed vestibulum sit amet cursus id turpis integer aliquet massa' WHERE project_id=20;

UPDATE project set project_description = 'odio justo sollicitudin ut suscipit a feugiat et eros vestibulum ac est' WHERE project_id=21;

UPDATE project set project_description = 'neque vestibulum eget vulputate ut ultrices vel augue vestibulum ante ipsum' WHERE project_id=22;

UPDATE project set project_description = 'non mi integer ac neque dui bibendum' WHERE project_id=23;

UPDATE project set project_description = 'justo etiam pretium iaculis justo in hac habitasse platea dictumst etiam faucibus' WHERE project_id=24;

UPDATE project set project_description = 'consequat in consequat ut nulla sed' WHERE project_id=25;

UPDATE project set project_description = 'primis in faucibus orci luctus et ultrices posuere cubilia curae nulla dapibus' WHERE project_id=26;

UPDATE project set project_description = 'nibh quisque id justo sit amet sapien' WHERE project_id=27;

UPDATE project set project_description = 'penatibus et magnis dis parturient' WHERE project_id=28;

UPDATE project set project_description = 'suscepit a feugiat et eros vestibulum ac est lacinia nisi venenatis tristique fusce congue diam' WHERE project_id=29;

UPDATE project set project_description = 'lorem ipsum dolor sit amet consectetur adipiscing elit proin interdum mauris' WHERE project_id=30;

UPDATE project set project_description = 'vitae ipsum aliquam non mauris morbi non lectus aliquam sit amet diam in magna bibendum' WHERE project_id=31;

UPDATE project set project_description = 'dis parturient montes nascetur ridiculus mus' WHERE project_id=32;

UPDATE project set project_description = 'justo in hac habitasse' WHERE project_id=33;

UPDATE project set project_description = 'posuere cubilia curae dui faucibus accumsan odio curabitur' WHERE project_id=34;

UPDATE project set project_description = 'vestibulum sagittis sapien cum sociis natoque' WHERE project_id=35;

UPDATE project set project_description = 'lobortis convallis tortor risus dapibus augue' WHERE project_id=36;

UPDATE project set project_description = 'elit proin interdum mauris non ligula pellentesque ultrices phasellus' WHERE project_id=37;

UPDATE project set project_description = 'nulla nisl nunc nisl dui bibendum felis sed interdum venenatis' WHERE project_id=38;

UPDATE project set project_description = 'iaculis diam erat fermentum justo nec' WHERE project_id=39;
UPDATE project set project_description = 'natoque penatibus et magnis dis parturient montes nascetur ridiculus mus etiam vel augue vestibulum rutrum' WHERE project_id=40;
UPDATE project set project_description = 'massa id nisl venenatis lacinia aenean sit amet justo morbi ut odio cras' WHERE project_id=41;
UPDATE project set project_description = 'nullam orci pede venenatis non sodales sed' WHERE project_id=42;
UPDATE project set project_description = 'amet sem fusce consequat nulla' WHERE project_id=43;
UPDATE project set project_description = 'nulla mollis molestie lorem quisque ut erat curabitur gravida nisi at nibh in hac' WHERE project_id=44;
UPDATE project set project_description = 'augue aliquam erat volutpat in congue etiam justo etiam pretium iaculis justo in hac habitasse' WHERE project_id=45;
UPDATE project set project_description = 'nulla ac enim in tempor' WHERE project_id=46;
UPDATE project set project_description = 'eu tincidunt in leo maecenas pulvinar lobortis est phasellus sit amet erat nulla' WHERE project_id=47;
UPDATE project set project_description = 'vulputate nonummy maecenas tincidunt lacus at' WHERE project_id=48;
UPDATE project set project_description = 'vitae consetetuer eget rutrum at lorem integer tincidunt ante vel ipsum praesent' WHERE project_id=49;
UPDATE project set project_description = 'posuere cubilia curae mauris viverra diam vitae quam suspendisse potenti nullam porttitor lacus at turpis' WHERE project_id=50;
UPDATE project set project_description = 'dapibus dui at velit eu est congue elementum in' WHERE project_id=51;
UPDATE project set project_description = 'erat quisque erat eros viverra eget congue eget semper rutrum nulla nunc' WHERE project_id=52;
UPDATE project set project_description = 'vehicula condimentum curabitur in libero ut massa volutpat convallis morbi odio odio elementum' WHERE project_id=53;
UPDATE project set project_description = 'duis faucibus accumsan odio curabitur convallis dui consequat dui nec nisi volutpat eleifend' WHERE project_id=54;
UPDATE project set project_description = 'et ultrices posuere cubilia curae nulla dapibus dolor vel est donec odio justo sollicitudin' WHERE project_id=55;

UPDATE deliverable set deliverable_title = 'pede venenatis non sodales' WHERE deliverable_id=1;
UPDATE deliverable set deliverable_title = 'eget congue eget semper' WHERE deliverable_id=2;
UPDATE deliverable set deliverable_title = 'metus' WHERE deliverable_id=3;
UPDATE deliverable set deliverable_title = 'fusce congue diam' WHERE deliverable_id=4;
UPDATE deliverable set deliverable_title = 'interdum eu' WHERE deliverable_id=5;
UPDATE deliverable set deliverable_title = 'risus semper' WHERE deliverable_id=6;
UPDATE deliverable set deliverable_title = 'adipiscing lorem' WHERE deliverable_id=7;
UPDATE deliverable set deliverable_title = 'iaculis justo in' WHERE deliverable_id=8;
UPDATE deliverable set deliverable_title = 'lacinia nisi' WHERE deliverable_id=9;
UPDATE deliverable set deliverable_title = 'pretium quis lectus suspendisse' WHERE deliverable_id=10;
UPDATE deliverable set deliverable_title = 'non mi integer ac' WHERE deliverable_id=11;

UPDATE deliverable set deliverable_title = 'amet consectetur' WHERE deliverable_id=12;

UPDATE deliverable set deliverable_summary = 'pede malesuada in imperdiet et commodo vulputate justo in blandit' WHERE deliverable_id=1;

UPDATE deliverable set deliverable_summary = 'ultrices posuere cubilia curae nulla dapibus dolor vel est donec odio justo sollicitudin' WHERE deliverable_id=2;

UPDATE deliverable set deliverable_summary = 'odio elementum eu interdum eu tincidunt in leo maecenas pulvinar lobortis est phasellus sit amet erat nulla tempus' WHERE deliverable_id=3;

UPDATE deliverable set deliverable_summary = 'nulla ultrices aliquet maecenas leo odio condimentum id luctus nec molestie sed justo pellentesque viverra pede ac' WHERE deliverable_id=4;

UPDATE deliverable set deliverable_summary = 'leo rhoncus sed vestibulum sit amet cursus id turpis integer aliquet massa id lobortis convallis tortor risus dapibus augue vel' WHERE deliverable_id=5;

UPDATE deliverable set deliverable_summary = 'tellus semper interdum mauris ullamcorper purus sit amet nulla quisque arcu libero rutrum ac lobortis vel dapibus' WHERE deliverable_id=6;

UPDATE deliverable set deliverable_summary = 'adipiscing elit proin interdum mauris non ligula pellentesque ultrices phasellus id sapien in sapien iaculis congue' WHERE deliverable_id=7;

UPDATE deliverable set deliverable_summary = 'eget eros elementum pellentesque quisque porta volutpat erat quisque erat eros viverra eget congue eget semper rutrum nulla nunc purus' WHERE deliverable_id=8;

UPDATE deliverable set deliverable_summary = 'montes nascetur ridiculus mus etiam vel augue vestibulum rutrum rutrum neque aenean auctor gravida sem' WHERE deliverable_id=9;

UPDATE deliverable set deliverable_summary = 'rhoncus aliquet pulvinar sed nisl nunc rhoncus dui vel sem sed sagittis nam' WHERE deliverable_id=10;

UPDATE deliverable set deliverable_summary = 'hac habitasse platea dictumst aliquam augue quam sollicitudin vitae consectetur eget rutrum at lorem integer tincidunt ante vel' WHERE deliverable_id=11;

UPDATE deliverable set deliverable_summary = 'libero quis orci nullam molestie nibh in lectus pellentesque at nulla suspendisse potenti' WHERE deliverable_id=12;