

WORK IN THE DATABASES COURSE OF 9th SEMESTER

SkillVerseDB

"Skills-Based Open-Source Project Matching Database"

First Deliverable

Ομάδα 36

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1 Εισαγωγή

1.1 Σκοπός Εφαρμογής

SkillVerse is a database platform linking individuals or teams to open-source projects based on their skills and expertise and making it easier for companies to find talented people based on their rating and passion and to offer jobs and organise events.

1.2 Περιγραφή Εφαρμογής

SkillVerseDB will store data on users, the teams they are in, the existing skills, projects and contributions to them, companies and jobs and events they offer and organise. Users can search for projects that match their skills, contribute to them, and receive evaluations from others. They can also create or join teams to contribute to bigger projects. Meanwhile, companies can search for and assess candidates based on their skills and rating for employment or collaboration through jobs and organize events .

1.3 Απαιτήσεις Εφαρμογής σε Δεδομένα

For the SkillVerse database, we expect to have:

- Around 100,000 user profiles to start with, including individuals and teams.
- Each user might have up to 8 skills listed, so about 800,000 skills entries in total.
- An average of 5 project contributions per user per week, leading to approximately 500,000 contributions per week.
- For teams, we could start with 10,000 teams, with each team working on an average of 2 projects.
- Around 10,000 open-source projects available for users to join and contribute to.
- Around 2,000 job offers from companies that search talented candidates
- Around 20 events per week (Hackthon, Announcement, Conference)

2 Κατηγορίες Χρηστών και Απαιτήσεις τους

Individual Users:

These are the people who will be using SkillVerse to find open-source projects that match their skills. They need:

- To be able to create a profile with their skills and expertise.
- Search and filter projects to find those that fit their skill set.
- View and receive ratings based on their contributions.
- Create or join teams to contribute to associated projects.
- Can join events organized by companies or showcase events they have joined.
- Can view job offers.

Admin:

The administrator is a crucial user in SkillVerse, overseeing critical operations and maintaining the platform's integrity. Their responsibilities and capabilities include:

- Full access to the entire database, enabling them to oversee and manage all user interactions and data.
- Authority to delete user accounts, ensuring the platform remains secure and compliant with policies.
- Implementing and updating security measures to protect user data and prevent unauthorized access.
- Capability to create and execute data backups, safeguarding against data loss or corruption.

Company:

Businesses looking for talent or wanting to outsource work to open-source contributors. They need:

- To create a company profile on the platform.
- Post job offers and search for candidates based on specific skills and ratings.
- Organize and post events such as hackathons or conferences.

Teams:

Groups of users who collaborate on projects. Their requirements include:

- One user who is the team leader creates a team profile and adds members.
- The Team Leader can create a Project.
- Team Leader can accept or decline contribution.
- Managing their collective skills and available projects.
- Collaborating on projects and tracking their team's contributions and ratings.

3 Μοντέλο Οντοτήτων/Συσχετίσεων

3.1 Γενική Περιγραφή

The entities are the User, Team, Project, Contribution, Event, Job, Company, and Skills. For each User, the system should record personal details like username, password, user_id, email, rating, and a Passion Indicator. A Team is identified by a team leader, team_id, name and has multiple members, with attributes like join_date and role for each member. Projects are defined with a project_id, team_id, project_name, start and end date, a status, description, and created_by and are linked to multiple teams. Contributions are linked to both Users and Projects, detailing the contributions made by users to projects with attributes such as contribution_id, contribution_state, details, rating and date. Events are characterized by event_id, name, type, description, duration, date, and location, and multiple users can participate in an event and they are organized by a Company. Jobs are posted by companies with a job_id, title, description, specific requirements, application deadlines, and job types. A Company is known by its company_id, industry, name, address, and contact information, and can organize multiple events as well as offer various jobs. Skills are associated with both Users and Jobs, indicating the proficiency of users in specific skills and the skills required for a job. They are identified by skill_id, a category and a name.

Assumptions:

- The user_id is unique for each individual. For example, if user_id 123 corresponds to a specific individual on the date 27/12/2018, then the same user_id (123) cannot be used for any other individual.
- Each team_id, project_id, and so on are unique identifiers within their respective entities.
- A User can join multiple Teams, and a Team can include many Users, but each association is characterized by a unique join_date and role-specific to that User-Team combination.
- A Project can be associated with only one Team, and a Team can work on multiple Projects.
- Skills are connected to both User and Job, indicating the level of proficiency of a User in a Skill, and the proficiency required for a Skill in a Job.
- In Job the requirements do not include hard skills but other requirements that are needed in a job like soft skills and more.
- In Skills we mean only Hard Skills.
- Team Leader manages the contributions in his Project.

3.2 Καθορισμός Οντοτήτων

Entity User:

Entity Name	User
Description	Entity storing the users of the system.
Characteristics	Strong Entity
Attributes	<u>user_id</u>
	username
	user_email
	user_password
	user_rating
	Passion_Indicator

Entity Team:

Entity Name	Team
Description	Entity representing a group of users working together.
Characteristics	Strong Entity
Attributes	<u>team_id</u>
	team_name
	team_leader
	time_created

Entity Project:

Entity Name	Project
Description	Entity representing the projects that Users can Contribute.
Characteristics	Weak Entity, depends on Team
Attributes	<u>project_id</u>
	project_name
	description
	start_date
	end_date
	project_status

Entity Contribution:

Entity Name	Contribution
Description	Entity capturing the contributions made by users to projects.
Characteristics	Weak Entity, depends on User and Project
Attributes	<u>contribution_id</u>
	contribution_date
	contribution_rating
	contribution_state
	contribution_details

Entity Event:

Entity Name	Event
Description	Entity for events that users can participate in.
Characteristics	Weak Entity, Depends on the Company
Attributes	<u>event_id</u>
	event_name
	event_type
	description
	date
	duration
	location

Entity Job:

Entity Name	Job
Description	Entity containing information about job listings.
Characteristics	Weak Entity, Depends on the Company
Attributes	<u>job_id</u>
	title
	description
	requirements
	application_deadline
	job_type

Entity Company:

Entity Name	Company
Description	Entity representing companies that organize events or offer jobs.
Characteristics	Strong Entity
Attributes	<u>company_id</u>
	name

	contact_info
	industry
	address

Entity Skill:

Entity Name	Skill
Description	Entity representing skills associated with users and jobs.
Characteristics	Strong Entity
Attributes	<u>skill_id</u>
	skill_name
	skill_category
	skill_proficiency (associated with User and Job)

3.3 Καθορισμός Συσχετίσεων

Relationship Table User Contributes to Project:

Relationship	User-ContributesTo-Project
Description	Each user can make multiple contributions to Projects.
Properties	Many-to-Many
Cardinality Ratio	M:N
Participation	Partial Participation of User
	Partial Participation of Project
Attributes	<u>contribution_id</u>
	contribution_date
	contribution_rating
	contribution_state
	contribution_details

Relationship Table Team Associated with Project:

Relationship	Team_associated with_Project
Description	Only one Team is associated with one project.
Properties	Has-A
Cardinality Ratio	1:N
Participation	Partial Participation of Team
	Total Participation of Project
Attributes	-

Relationship Table User is member of the Team:

Relationship	User_Is_Member_of_Team
Description	Users are members of teams, and a team may have many users.
Properties	Is-A, Many-to-Many
Cardinality Ratio	N:M
Participation	Partial Participation of User
	Partial Participation of Team
Attributes	join_date, role

Relationship Table Skill Associated with Project:

Relationship	Skills_Associated_With_Project
Description	Projects may require multiple skills, and a skill may be associated with multiple projects.
Properties	Has-A, Many-to-Many
Cardinality Ratio	M:N
Participation	Partial Participation of both Skills and Project
Attributes	-

Relationship Table User join Event:

Relationship	User_Join_Event
Description	Users can join multiple events, and an event can have multiple participants.
Properties	Has-A, Many-to-Many
Cardinality Ratio	M:N
Participation	Partial Participation of both User and Event
Attributes	-

Relationship Table User has Skill:

Relationship	User_has_Skill
Description	Users possess various skills, and a skill can belong to multiple users.
Properties	Has-A, Many-to-Many
Cardinality Ratio	M:N
Participation	Partial Participation of both User and Skill
Attributes	skill_proficiency

Relationship Table Skill required in Job:

Relationship	Job_Require_Skills
Description	Jobs require certain skills, and a skill may be required in multiple jobs.
Properties	Has-A, Many-to-Many
Cardinality Ratio	M:N
Participation	Partial Participation of both Skills and Job
Attributes	skill_proficiency

Relationship Table Company organize Event:

Relationship	Company_Organize_Event
Description	Companies organize events, and an event may be organized by multiple companies.
Properties	Has-A
Cardinality Ratio	1:N
Participation	Total Participation of Event
	Partial Participation of Company
Attributes	-

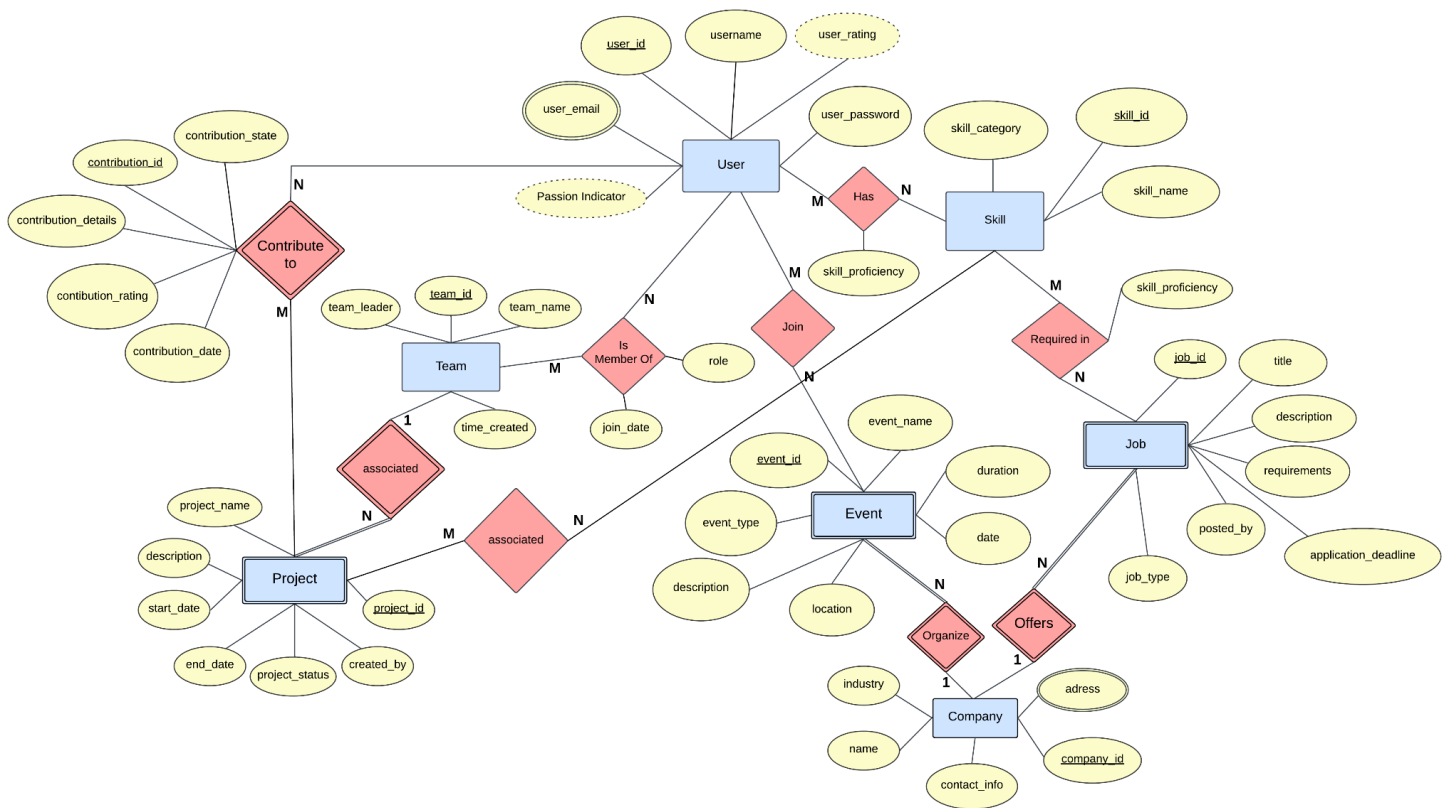
Relationship Table Company offers Job:

Relationship	Company_Offer_Job
Description	A company offers various jobs, but a job is offered by one company.
Properties	Has-A
Cardinality Ratio	1:N
Participation	Partial Participation of Company
	Total Participation of Job
Attributes	-

3.4 Διάγραμμα Οντοτήτων/Συσχετίσεων

Link of Lucidchart: [Διάγραμμα Οντοτήτων/Συσχετίσεων Lucidchart](#) (ER)

Example for SkillVerse:



4 Σχεσιακό Μοντέλο

4.1 Πεδία Ορισμού

Definition of Database Schema

```
DECLARE SCHEMA SkillVerseDB;
```

Definition of Domain Fields:

```
DECLARE DOMAIN LONG_ID TYPE INT(10) ;
```

```
DECLARE DOMAIN SHORT_ID TYPE INT(6) ;
```

```
DECLARE DOMAIN NAME TYPE VARCHAR(50) ;
```

```
DECLARE DOMAIN EMAIL TYPE VARCHAR(100);
```

```
DECLARE DOMAIN RATING TYPE DECIMAL(3,0);
```

```
DECLARE DOMAIN PASSWORD TYPE VARCHAR(80) ;
```

```
DECLARE DOMAIN DATE TYPE DATE ;
```

```
DECLARE DOMAIN DESCRIPTION TYPE TEXT;
```

```
DECLARE DOMAIN PROJECT_STATUS TYPE ENUMERATED {'Completed', 'In Progress',  
'Not Started'}
```

```
DECLARE DOMAIN CONTRIBUTION_STATE TYPE ENUMERATED {'Accepted', 'Pending',  
'Decline'}
```

```
DECLARE DOMAIN DURATION TYPE TIME;
```

```
DECLARE DOMAIN LOCATION TYPE VARCHAR(255);
```

4.2 Σχέσεις

DECLARE RELATION	User
FOR SCHEMA	SkillVerseDB
Attributes:	
Name	Domain field
user_id	SHORT_ID
username	NAME
user_email	EMAIL
user_password	PASSWORD
user_rating	RATING
Passion_Indicator	RATING
Constraints:	
Primary Key	user_id
Foreign Keys	-

DECLARE RELATION	Team
FOR SCHEMA	SkillVerseDB
Attributes:	
Name	Domain field
team_id	SHORT_ID
team_name	NAME
team_leader	NAME
time_created	DATE
Constraints:	
Primary Key	team_id
Foreign Keys	-

DECLARE RELATION	Project
FOR SCHEMA	SkillVerseDBD
Attributes:	
Name	Domain field
project_id	SHORT_ID
project_name	NAME
description	DESCRIPTION
start_date	DATE
end_date	DATE
project_status	PROJECT_STATUS
team_id	SHORT_ID

Constraints:	
Primary Key	project_id
Foreign Keys	team_id → Team

DECLARE RELATION	Event
FOR SCHEMA	SkillVerseDB
Attributes:	
Name	Domain field
<u>event_id</u>	SHORT_ID
event_type	NAME
description	TEXT
location	LOCATION
event_name	NAME
duration	RATING
date	DATE
company_id	SHORT_ID
Constraints:	
Primary Key	event_id
Foreign Keys	company_id->Company

DECLARE RELATION	Skill
FOR SCHEMA	SkillVerseDB
Attributes:	
Name	Domain field
<u>skill_id</u>	SHORT_ID
skill_category	NAME
skill_name	NAME
Constraints:	
Primary Key	skill_id
Foreign Keys	-

DECLARE RELATION	Job
FOR SCHEMA	SkillVerseDB
Attributes:	
Name	Domain field
job_id	SHORT_ID
job_type	NAME

DECLARE RELATION	Job
FOR SCHEMA	SkillVerseDB
Attributes:	
Name	Domain field
job_id	SHORT_ID
application_deadline	DATE
requirements	TEXT
description	TEXT
title	NAME
company_id	SHORT_ID
Constraints:	
Primary Key	job_id
Foreign Keys	company_id->Company

DECLARE RELATION	Company
FOR SCHEMA	SkillVerseDB
Attributes:	
Name	Domain field
company_id	SHORT_ID
name	NAME
contact_info	NAME
address	LOCATION
industry	NAME
Constraints:	
Primary Key	company_id
Foreign Keys	-

DECLARE RELATION	User_Contribute_to_Project
FOR SCHEMA	SkillVerseDB
Attributes:	
Name	Domain field
project_id	SHORT_ID
user_id	SHORT_ID
contribution_id	LONG_ID
contribution_details	DESCRIPTION
contribution_date	DATE
contribution_rating	RATING

contribution_state	CONTRIBUTION_STATE
Constraints:	
Primary Key	contribution_id,project_id,user_id
Foreign Keys	project_id → Project, user_id→ User

DECLARE RELATION	User_Join_Events
FOR SCHEMA	SkillVerseDB
Attributes:	
Name	Domain field
user_id	SHORT_ID
event_id	SHORT_ID
Constraints:	
Primary Key	user_id, event_id
Foreign Keys	user_id→ User, event_id→ Event

DECLARE RELATION	Project_Associated_Skill
FOR SCHEMA	SkillVerseDB
Attributes:	
Name	Domain field
project_id	SHORT_ID
skill_id	SHORT_ID
Constraints:	
Primary Key	skill_id, project_id
Foreign Keys	project_id→ Project, skill_id→ Skill

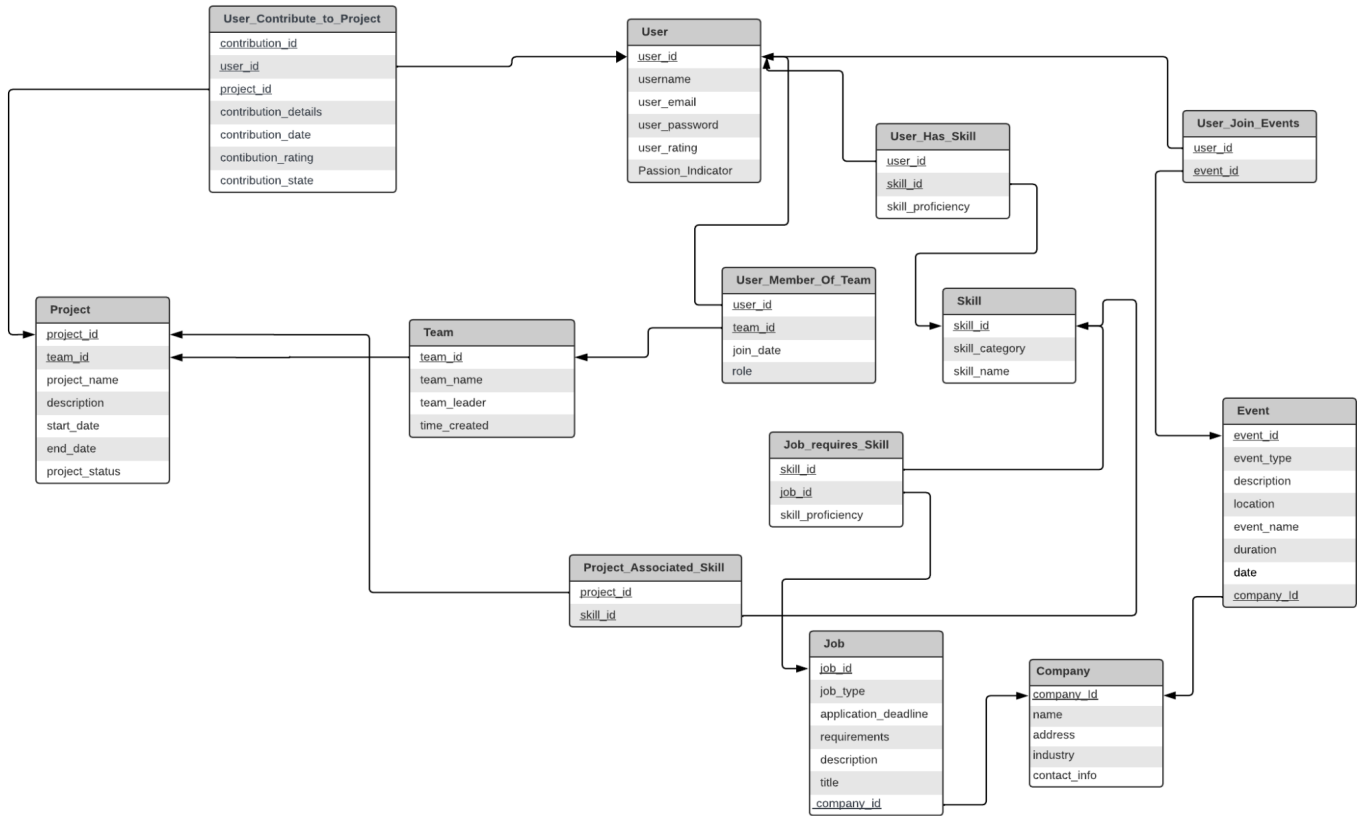
DECLARE RELATION	User_Member_Of_Team
FOR SCHEMA	SkillVerseDB
Attributes:	
Name	Domain field
team_id	SHORT_ID
user_id	SHORT_ID
join_date	DATE
role	NAME
Constraints:	
Primary Key	team_id, user_id
Foreign Keys	team_id -> Team, user_id -> User

DECLARE RELATION	User_Has_Skills
FOR SCHEMA	SkillVerseDB
Attributes:	
Name	Domain field
user_id	SHORT_ID
skill_id	SHORT_ID
skill_proficiency	RATING
Constraints:	
Primary Key	user_id, skill_id
Foreign Keys	skill_id -> Skill, user_id -> User

DECLARE RELATION	Job_requires_Skill
FOR SCHEMA	SkillVerseDB
Attributes:	
Name	Domain field
job_id	SHORT_ID
skill_id	SHORT_ID
skill_proficiency	RATING
Constraints:	
Primary Key	job_id, skill_id
Foreign Keys	job_id->Job,skill_id->Skill

4.3 Σχεσιακό Σχήμα

Link: [Σχεσιακό Σχήμα Lucidchart](#)



4.4 Όψεις

Skill Proficiency Summary:

Description: A view that provides user's emails and name and their skill and proficiency this can be helpful for companies that want to find users with their specific skills and proficiency or a team leader that what to invite a user to contribute to their project with their desire expertise or the user who want to see there skill and proficiency on them.

Relational Algebra:

$$\rho_{\text{User_Skill_Proficiency(Username, Email, Skill, Proficiency)}} ((\pi_{\text{username, user_email, skill_name, skill_proficiency}} (\pi_{\text{user_id, skill_id, skill_proficiency}} (\text{User_Has_Skill})) \bowtie \pi_{\text{skill_id, skill_name}} (\text{Skill})) \bowtie \pi_{\text{user_id, username, user_email}} (\text{User})))$$

Usefulness: This view would be beneficial for quickly identifying the skill set and proficiency levels of users, which can be used for matching them to suitable projects or jobs.

What Team and their members are working on a Project:

Description: A view showing what team and their members are working on what project.

Relational Algebra:

$$\rho_{\text{Teams_on_Project(Project_Name,Project_Description,Project_Status,Team_Name,Team_Leader, Username)}} (\pi_{\text{project_name,description,project_status,team_name,team_leader,username}} (((\pi_{\text{project_id,project_name,description,project_status,team_id}} (\text{Project})) \bowtie \pi_{\text{team_id,team_name,team_leader}} (\text{Team})) \bowtie \pi_{\text{team_id,user_id}} (\text{User_Member_Of_Team})) \bowtie \pi_{\text{user_id,username}} (\text{User})))$$

Usefulness: Helps project managers(Team Leader) to see which team and their members are assigned to projects, aiding in resource allocation and project tracking.

Available Jobs of company and skills require:

Description: A view of all the jobs from what company are and at the same time what skills are required for this job.

Relational Algebra:

$\rho_{Jobs_Description} (company_name, job_title, job_description, job_requirements, skill_require_name, skill_proficiency) \bowtie (\pi_{name, title, description, requirements, skill_name, skill_proficiency} ((\pi_{name, company_id} (COMPANY) \bowtie \pi_{company_id, title, description, requirements, job_id} (JOB)) \bowtie \pi_{job_id, skill_id} (Job_Requires_Skill)) \bowtie \pi_{skill_id, skill_name, skill_category} (Skill)))$

Usefulness: Useful for users seeking jobs of a company that match their wanted skills.

Detail of the Contribution of the Users on Projects:

Description: A list of users along with their emails, the projects they are involved in, and the details of their contributions to these projects.

Relational Algebra:

$\rho_{User_Contribution_detail} (Username, User_Email, Project_Name, Contribution_Rating, Contribution_Details, contribution_state) \bowtie (\pi_{username, user_email, project_name, contribution_rating, contribution_details} ((\pi_{contribution_id, contribution_rating, project_id, user_id, contribution_state, contribution_details} (User_Contribute_to_Project) \bowtie \pi_{project_id, project_name} (Project))) \bowtie \pi_{user_id, username, user_email} (User)))$

Usefulness: This is very helpful for the Companies, Teams and Project Managers(Team Leader) to see the User Performance in Detail.

5 Παραδείγματα

5.1 Παραδείγματα Πινάκων

USER:

user_id	username	user_password	user_email	user_rating	Passion _Indicat or
760765	mdadopoul	p@ssw0rd1	mdadopoul@skillversedb.com	99	99
389239	chrysostk	p@ssw0rd2	chrysostk@skillversedb.com	99	99
377584	dkombit	p@ssw0rd3	dkombit@skillversedb.com	99	99
61584	Anonymou s	12345678	Anonymous@skillversedb.com	1	1

User: Approximately 100,000 user profiles to start with.

TEAM:

team_id	team_name	team_leader	time_created
282483	Trash Team	7607652832	2024-01-01
691808	Beta Squad	3892390261	2024-02-15
601980	Gamma Group	3775843783	2024-03-20
601985	Delta Squad	615843783	2024-04-25

Teams: Starting with 10,000 teams.

Project:

project_id	project_name	description	start_date	end_date	project_status	team_id
228258	Project Mercury	Space exploration project.	2024-01-10	2024-12-31	Completed	282483
754503	Project Venus	Climate study initiative.	2024-03-15	2024-11-30	In progress	601980
761553	Project Earth	Sustainable energy development.	2024-05-20	2024-10-15	Completed	691808
295162	Project Mars	Mars colonization research.	2024-07-25	2024-09-30	Not started	601985

Projects: Around 10,000 open-source projects available for users to join and contribute to.

User_Contribute_to_Project:

contribution_id	user_id	project_id	contribution_details	contribution_date	contributing	contribution_status
941710	760765	228258	Developed module A.	2024-05-01	67	Accepted
595508	389239	754503	Researched climate patterns.	2024-06-11	88	Decline
284678	377584	761553	Implemented energy solution B.	2024-07-22	61	Accepted

502453	249800	295162	Conducted feasibility study for habitat.	2024-08-15	83	Pending
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Contributions: With an average of 5 project contributions per user per week, and assuming the platform runs for a year, there could be roughly 26 million contribution entries (100,000 users * 5 contributions * 52 weeks).

User_Member_Of_Team:

user_id	team_id	join_date	role
760765	282483	2024-01-15	Developer
389239	691808	2024-01-16	Junior Designer
377584	601980	2024-01-17	Project Manager
249800	551602	2024-01-18	Data Analyst

Job_requires_Skill:

skill_id	job_id	skill_proficiency
1	100001	80
2	100002	75
3	100003	40
4	100004	85

JOB:

job_id	job_type	application_deadline	requirements	description	title	company_id
100001	Full-time	2024-11-26	Requirement details for Full-time.	Full-time position with competitive benefits and growth opportunities .	Software Developer	1001
100002	Part-time	2024-01-08	Requirement details for Part-time.	Flexible part-time role suitable for students or those seeking work-life balance.	Graphic Designer	1002
100003	Internship	2024-12-20	Requirement details for Internship.	Internship offering hands-on experience in industry projects and professional mentorship.	Marketing Intern	1003
100004	Full-time	2024-11-31	Requirement details for Contract.	Contractual work focusing on specific projects with possibilities for extension.	Data Analyst	1004

Jobs: Approximately 2,000 job offers from companies.

COMPANY:

company_id	name	address	industry	contact_info
1001	Google	1600 Amphitheatre Pkwy, Mountain View, CA, 940431	Tech	google@info.com
1002	Microsoft	One Microsoft Way, Redmond, WA 980522	Tech	microsoft@info.com

1003	Apple	Apple Park Way, Cupertino, CA 950143	Tech	apple@info.com
1004	Tesla	1 Apple Park Way, Cupertino, CA 950143	Tech	tesla@info.com

Company: Approximately 2,000 companies.

Event:

event_id	event_type	description	location	event_name	duration	date
1	Hackathon	A collaborative computer programming event where participants create software solutions.	Tech Hub	Hack the Future	02:00:00	2024-08-01
2	Seminar	A lecture or presentation delivered to an audience on a particular topic or set of topics.	Innovation Center	Design Thinking	03:00:00	2024-08-02
3	Workshop	A brief intensive course, a seminar or a series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Startup Loft	Agile Methodologies	04:00:00	2024-08-03
4	Conference	A formal meeting where participants exchange their views on various topics.	Convention Center	Tech Leaders 2023	05:00:00	2024-08-04

Events: With around 20 events per week over a year, this would amount to around 1,040 events (20 events * 52 weeks).

Skill:

skill_id	skill_category	skill_name
1	Frontend	HTML
2	Backend	PHP
3	Frontend	React
4	Backend	Node
5	Data Science	Python
6	Backend	Django
7	Frontend	Css
8	Frontend	JavaScript

Skills: Each user might have up to 8 skills listed, resulting in approximately 800,000 skill entries in total.

User_Has_Skill:

user_id	skill_id	skill_proficiency
760765	2	70
760765	4	20
389239	2	40
389239	3	95

5.2 Παραδείγματα Ερωτημάτων

Description: Listing All Contributions to a Specific Project. This can be helpful for someone to see the details of all contributions to this single project.

Relational Algebra:

$\Pi_{\text{project_name, contribution_rating, contribution_state, contribution_details}}$

$(\Pi_{\text{contribution_id, contribution_rating, project_id, contribution_state, contribution_details}}(\sigma_{\text{contribution_state='Accepted'}}(\text{User_Contribute_to_Project}))) \bowtie \Pi_{\text{project_id, project_name}}(\sigma_{\text{project_name='Project Mercury'}}(\text{Project}))$

Usefulness: Useful for the team leader for evaluating the performance of the member in his team.

Skill Proficiency Summary:

Description: A view that provides user's emails and name from all users that have greater than 80 proficiency to a specific skill(React) , this can be helpful for companies that want to find users with their specific skills and proficiency or a team leader that what to invite a user to contribute to their project with their desire expertise.

Relational Algebra:

$\rho_{\text{Master_pyth(id, skill, proficiency, name, email)}}(\sigma_{\text{skill_name=React} \wedge \text{skill_proficiency}>80}(\Pi_{\text{user_id, skill_name, skill_proficiency}}(\Pi_{\text{user_id, skill_id, skill_proficiency}}(\text{User_Has_Skill})) \bowtie \Pi_{\text{skill_id, skill_name}}(\text{Skill})) \bowtie \Pi_{\text{user_id, username, user_email}}(\text{User})))$

Usefulness: This view would be beneficial for quickly identifying the skill set and proficiency levels of users, which can be used for matching them to suitable projects or jobs.

Active Projects with Team Members:

Description: A view showing all active projects and the team members working on them.

Relational Algebra:

$$\begin{aligned} & ((\pi_{\text{project_id}, \text{team_id}, \text{project_name}}(\pi_{\text{project_id}, \text{team_id}, \text{project_name}}(\sigma_{\text{project_status}='InProgress'}(\text{Project}))) \\ & \bowtie \pi_{\text{team_id}, \text{user_id}}(\text{User_Member_Of_Team}))) \\ & \bowtie \pi_{\text{user_id}, \text{username}}(\text{User})) \end{aligned}$$

Usefulness: Helps project managers to see which users are assigned to ongoing projects, aiding in resource allocation and project tracking.

Available Jobs of a certain company with certain skills:

Description: A view of all the jobs of a certain company and at the same time these jobs have requirements for a certain list of skills.

Relational Algebra:

$$\begin{aligned} & \pi_{\text{job_id}, \text{title}, \text{description}, \text{requirements}}((\pi_{\text{name}, \text{company_id}}(\sigma_{\text{name}='Google'}(\text{COMPANY}))) \bowtie \pi_{\text{company_id}, \text{title}, \\ & \text{description}, \text{requirements}, \text{job_id}}(\text{JOB}))) \bowtie \pi_{\text{job_id}, \text{skill_id}}(\text{Job_Requires_Skill})) \bowtie \pi_{\text{skill_id}, \\ & \text{skill_name}}(\sigma_{\text{skill_name}='Python' \wedge \text{skill_name}='HTML'}(\text{Skill}))) \end{aligned}$$

Usefulness: Useful for users seeking jobs of a company that match their wanted skills.

Finding Users with All High-Proficiency Skills:

Description: This view finds users who have a high proficiency (greater than 40) in their skills. It filters skills based on a set proficiency threshold and then finds users who meet or exceed this threshold across all these skills.

$$\pi_{\text{username, user_email}}(\pi_{\text{username, user_email, user_id}}(\text{User})) \bowtie (\pi_{\text{user_id, skill_id}}(\sigma_{\text{skill_proficiency} > 40}(\text{User_Has_Skill}))) \div (\pi_{\text{skill_id}}(\sigma_{\text{skill_name} = \text{PHP} \vee \text{skill_name} = \text{React}}(\text{Skill})))$$

Usefulness: This view helps find users who are really good at many skills. It's great for people who need to hire or choose team members for important, difficult tasks.