Presentation av YrkesCo´s databas

Erik Unevik 2025-04-08

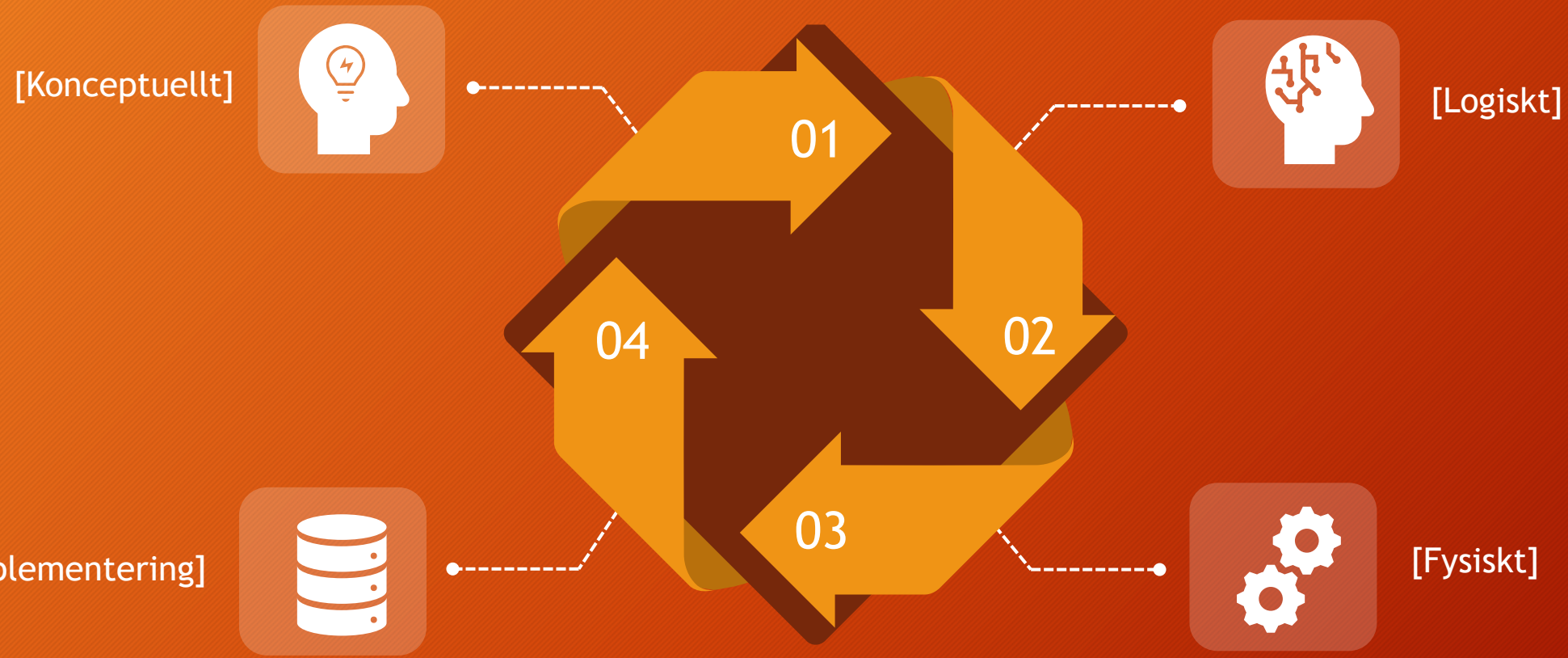
Databasen innehåller

- YrkesCo´s tre olika skolor
- Sju olika program fördelade till årskullarna 2022, 2023, 2024
- 26 olika kurser (varav tre valbara)
- 397 Inskrivna studenter
- 15 lärare – varav sju konsulter, två YH – anordnare och sju utbildningsledare

Business rules, utöver er kravspecfikation

1. För att en kurs skall registreras/köras så behöver ett minimum av 10 studenter vara inskrivna.
2. Utbildningsledare och YH-anordnare är fast anställda.
3. Varje skola kan ha en eller flera YH-anordnare knutna till sig
4. Varje lärare måste hålla i minst en kurs.
5. Varje YH-anordnare måste ha ansvar för minst en skola.
6. Varje student måste vara inskriven till minst en kurs.

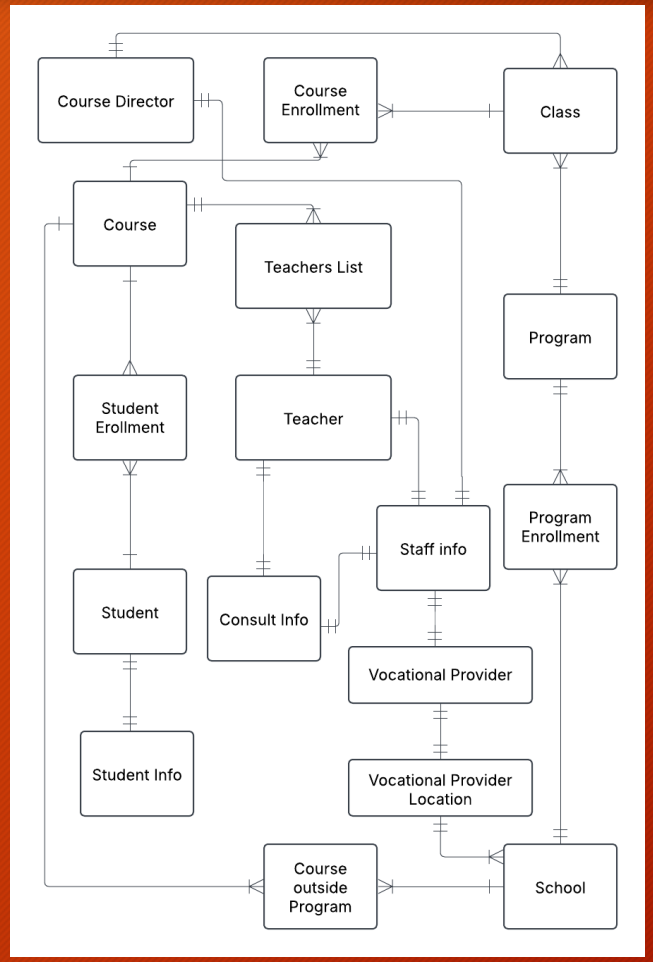
Erik Unevik 2025-04-08



Hur databasen skapades steg för steg

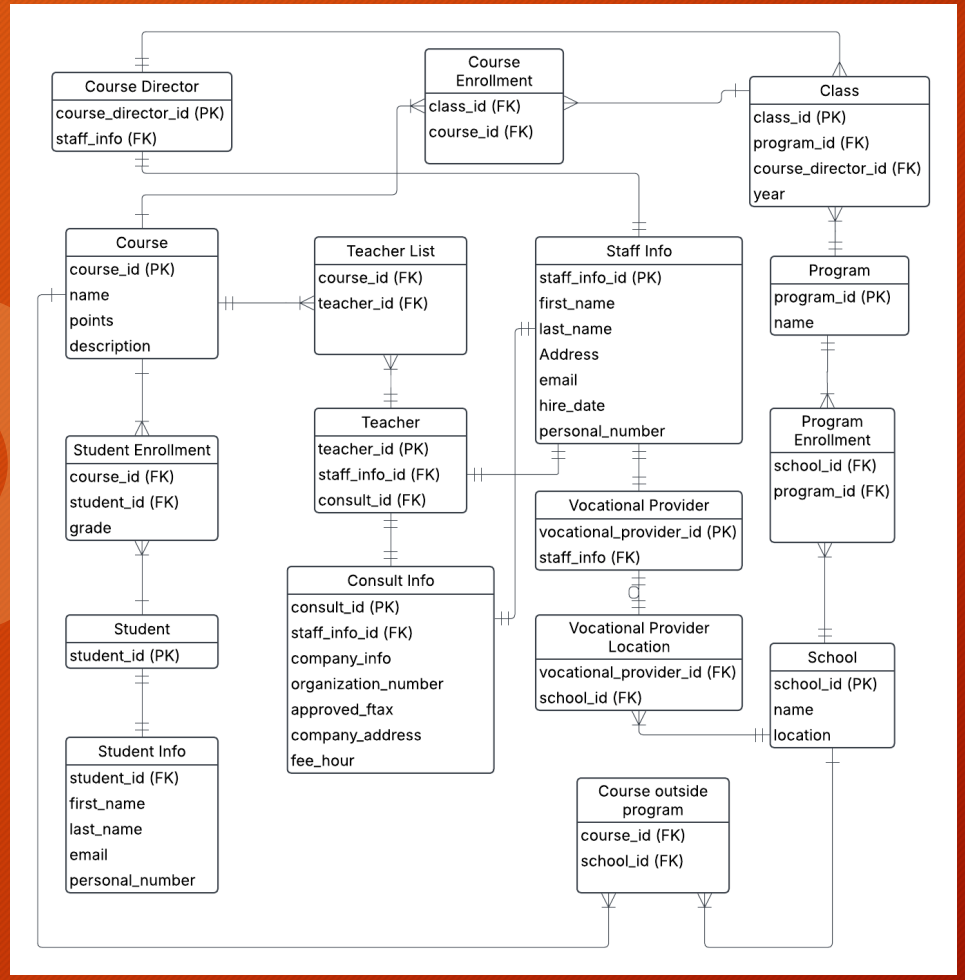
Erik Unevik 2025-04-08

Det första konceptuella diagramet över databasen



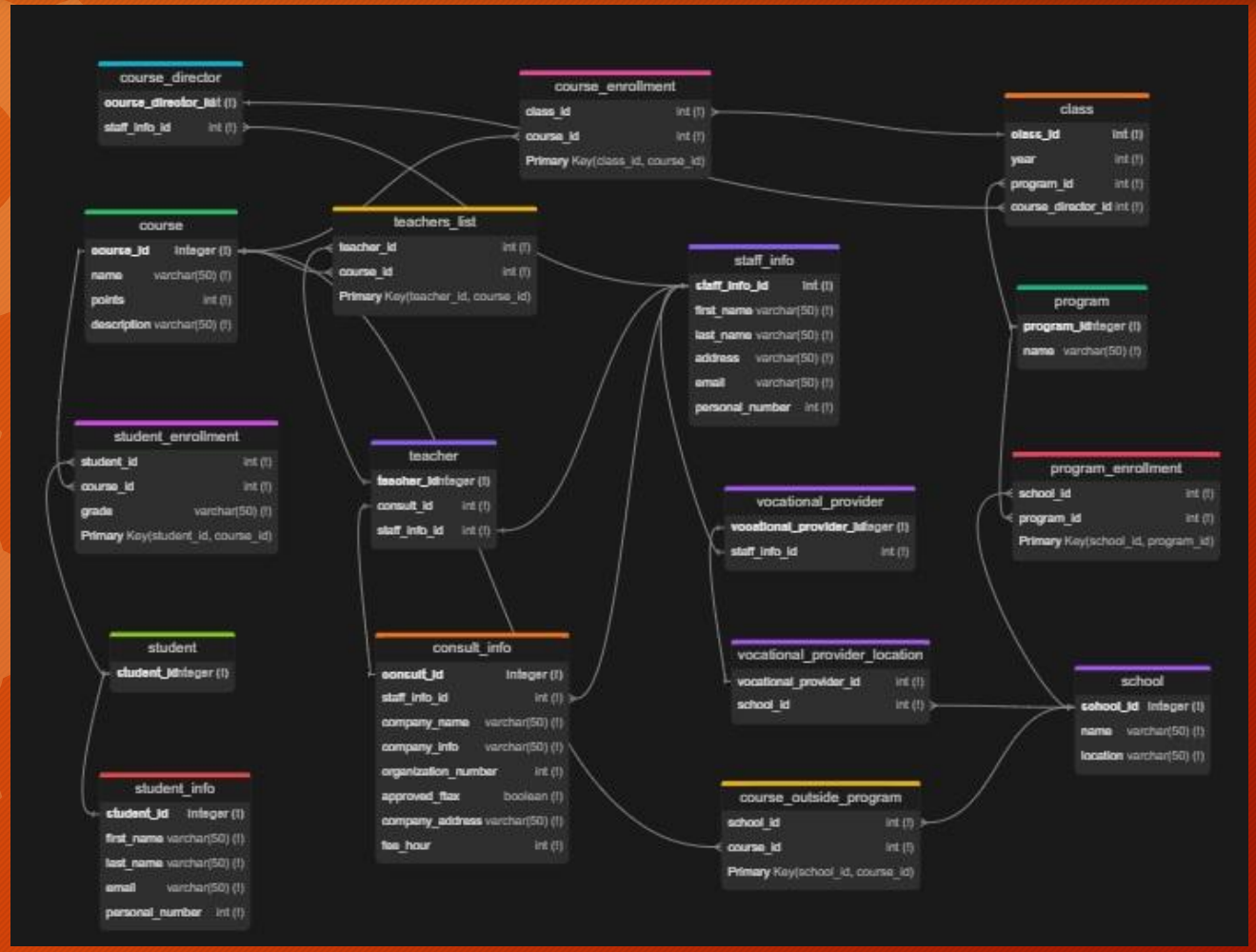
Erik Unevik 2025-04-08

Den logiska modellen



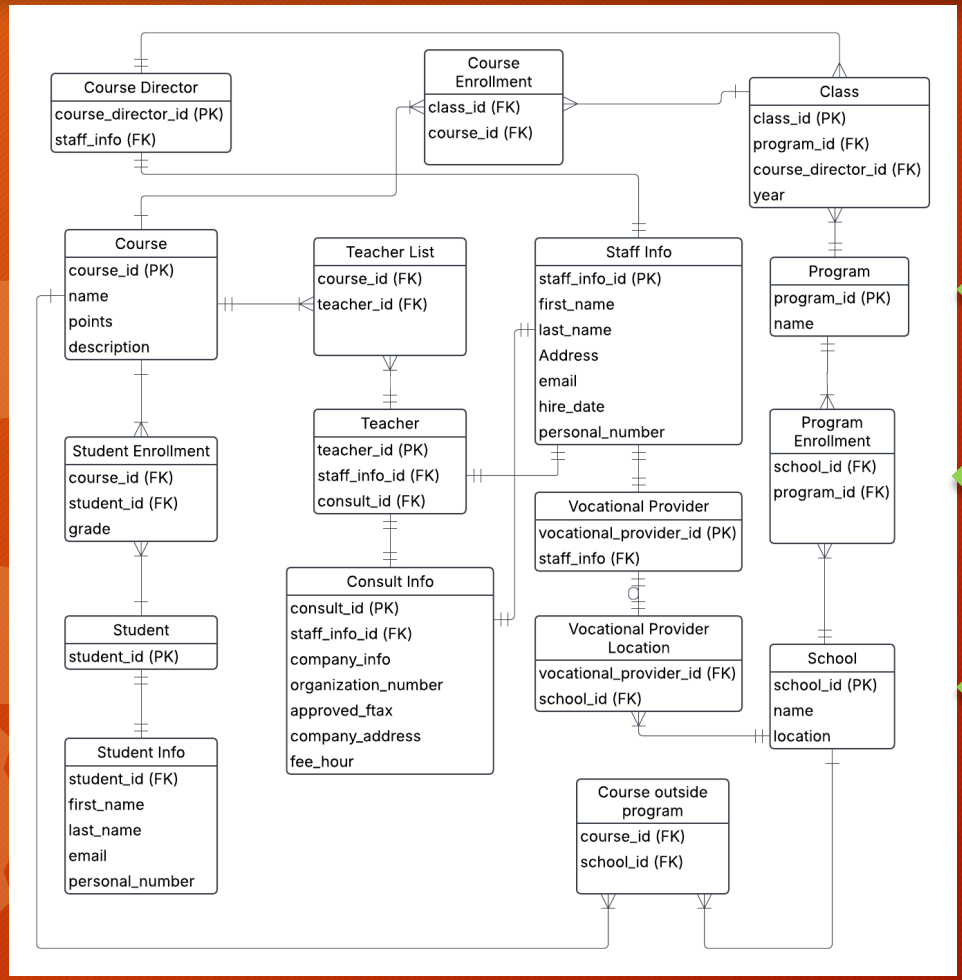
Erik Unevik 2025-04-08

Den fysiska modellen



Erik Unevik 2025-04-08

Implementering



Erik Unevik 2025-04-08

Implementering forts.

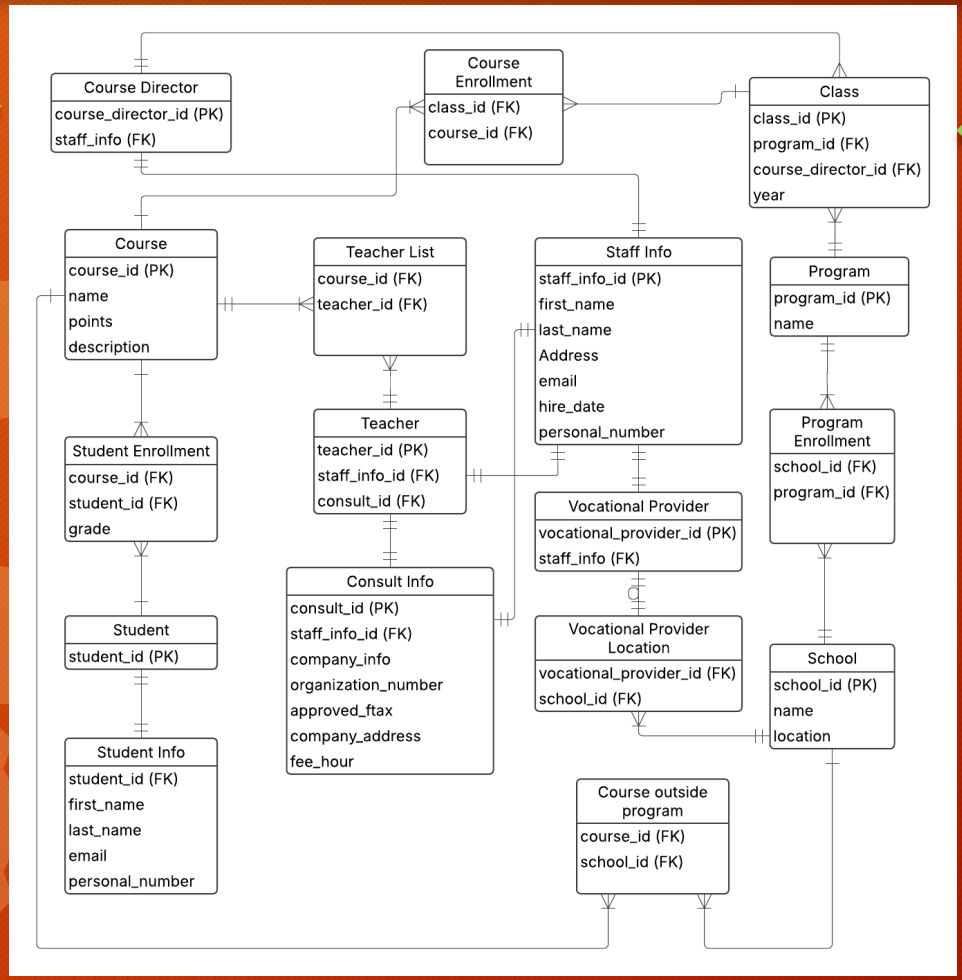
7 rows returned

	program_name character varying	schools_offering_program text
1	Cyber Security	YrkesCo Göteborg, YrkesCo Stockholm, YrkesCo Malmö
2	BIM Design for Infrastructure	YrkesCo Stockholm
3	Java Developer	YrkesCo Stockholm
4	Electrical Installation Project Manager	YrkesCo Malmö
5	Data Engineer	YrkesCo Stockholm, YrkesCo Göteborg
6	HVAC Engineer	YrkesCo Malmö, YrkesCo Göteborg
7	Railway Project Engineer	YrkesCo Göteborg

```
2
3   SET search_path TO yrkesco;
4
5   SELECT
6       p.name AS program_name,
7       STRING_AGG(s.name, ', ') AS schools_offering_program
8   FROM program_enrollment AS pe
9   JOIN program AS p ON pe.program_id = p.program_id
10  JOIN school AS s ON pe.school_id = s.school_id
11  GROUP BY p.name;
12
```

Erik Unevik 2025-04-08

Implementering forts.



Erik Unevik 2025-04-08

Implementering forts.

21 rows returned

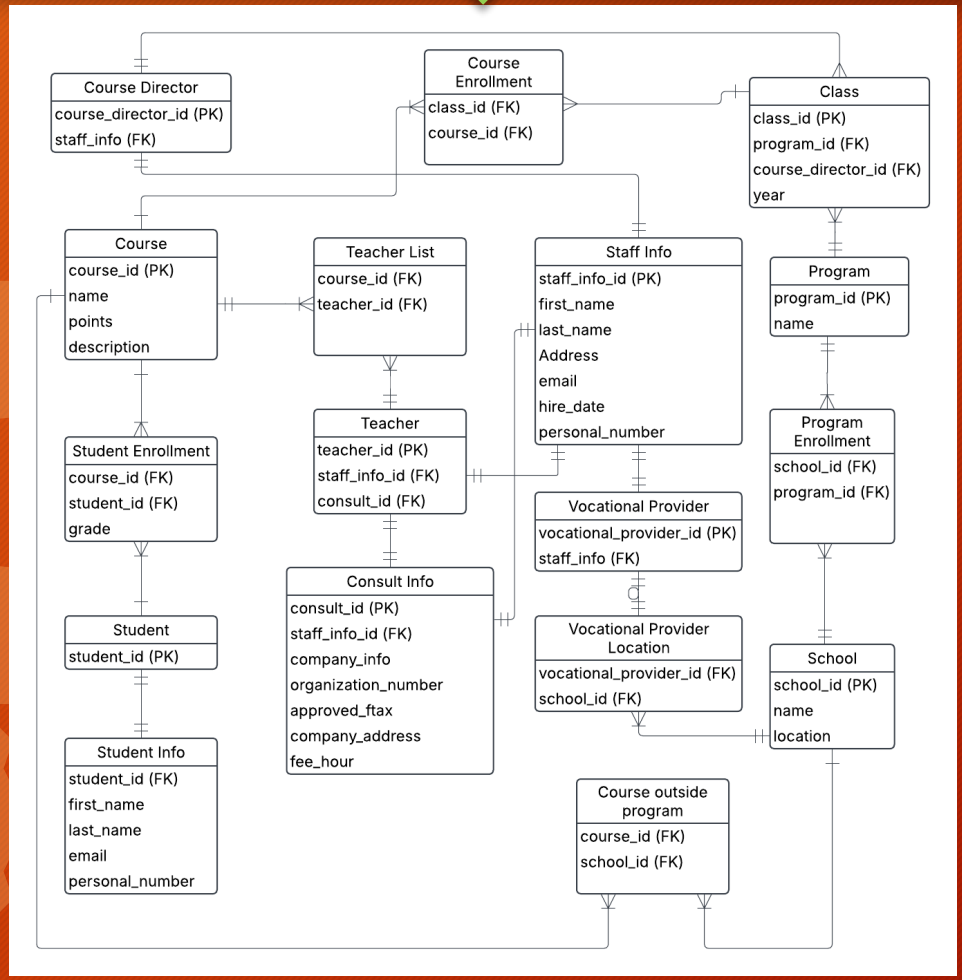
	course_director text	class_id integer	program_name character varying
1	Alice Nilsson	1	Data Engineer
2	Alice Nilsson	8	Railway Project Engineer
3	Alice Nilsson	15	Electrical Installation Project Manager
4	Bob Svensson	2	Data Engineer
5	Bob Svensson	9	Railway Project Engineer
6	Bob Svensson	16	HVAC Engineer
7	Carla Larsson	3	Data Engineer
8	Carla Larsson	10	Cyber Security
9	Carla Larsson	17	HVAC Engineer
10	David Andersson	4	Java Developer
11	David Andersson	11	Cyber Security
12	David Andersson	18	HVAC Engineer
13	Ella Johansson	5	Java Developer
14	Ella Johansson	12	Cyber Security
15	Ella Johansson	19	BIM Design for Infrastructure
16	Fredrik Ek	6	Java Developer
17	Fredrik Ek	13	Electrical Installation Project Manager
18	Fredrik Ek	20	BIM Design for Infrastructure
19	Greta Lund	7	Railway Project Engineer
20	Greta Lund	14	Electrical Installation Project Manager
21	Greta Lund	21	BIM Design for Infrastructure

```sql
SET search_path TO yrkesco;

SELECT
    si.first_name || ' ' || si.last_name AS course_director,
    c.class_id,
    p.name AS program_name
FROM yrkesco.class c
JOIN yrkesco.course_director cd ON c.course_director_id = cd.course_director_id
JOIN yrkesco.staff_info si ON cd.staff_info_id = si.staff_info_id
JOIN yrkesco.program p ON c.program_id = p.program_id
ORDER BY course_director, class_id;
```

Erik Unevik 2025-04-08

Implementering forts.



Erik Unevik 2025-04-08

Implementering forts.

{"command":"SET","rowCount":null,"oid":null,"rows":[],"fields":[],"_

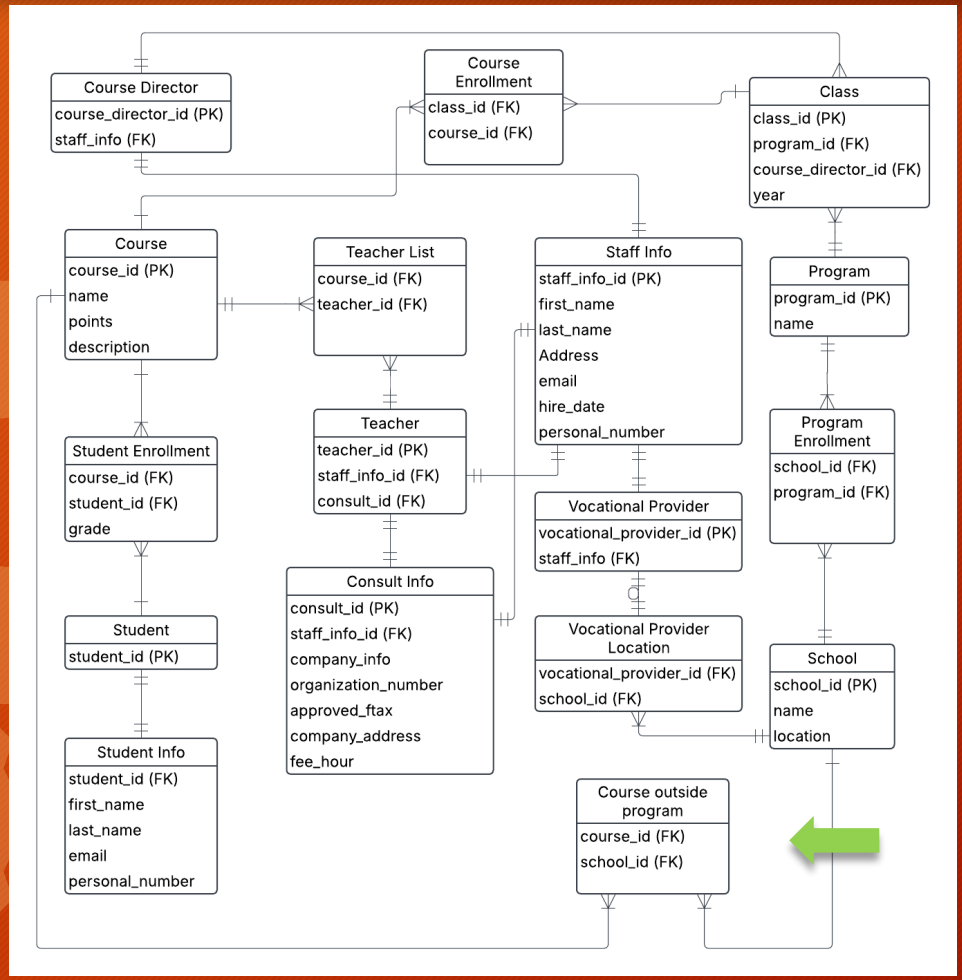
17 rows returned

	program character varying	course character varying
1	BIM Design for Infrastructure	Infrastructure Modeling in Revit
2	BIM Design for Infrastructure	Intro to BIM & 3D Modeling
3	Cyber Security	Cyber Threats & Defense
4	Cyber Security	Network Security Fundamentals
5	Data Engineer	ETL & Data Pipelines
6	Data Engineer	Python Programming
7	Data Engineer	SQL & Data Modeling
8	Electrical Installation Project Manager	Electrical Systems & Safety
9	Electrical Installation Project Manager	Project Coordination
10	HVAC Engineer	Energy Efficiency & Sustainability
11	HVAC Engineer	HVAC System Design
12	Java Developer	Java Fundamentals
13	Java Developer	Spring Boot & APIs
14	Java Developer	Version Control with Git
15	Railway Project Engineer	Project Management Basics
16	Railway Project Engineer	Railway Safety Standards
17	Railway Project Engineer	Track Construction & Planning

```sql
SET search_path TO yrkesco;

SELECT
    p.name AS program,
    c.name AS course
FROM course_enrollment ce
JOIN class cl ON ce.class_id = cl.class_id
JOIN program p ON cl.program_id = p.program_id
JOIN course c ON ce.course_id = c.course_id
WHERE cl.year = 2022
ORDER BY p.name, c.name;
```

Implementering forts.



Erik Unevik 2025-04-08

Implementering forts.

{"command":"SET","rowCount":null,"oid":null,"rows":[],"fields":[

23 rows returned

	course character varying	student_count bigint
1	ETL & Data Pipelines	98
2	Agile Software Development	91
3	Infrastructure Modeling in Revit	71
4	Python Programming	68
5	Ethical Hacking Basics	55
6	Technical Documentation	52
7	Railway Safety Standards	47
8	Coordination & Clash Detection	41
9	Energy Efficiency & Sustainability	40
10	Spring Boot & APIs	40
11	Cyber Threats & Defense	39
12	Java Fundamentals	39
13	Project Management Basics	39
14	HVAC System Design	37
15	Cost Estimation & Budgeting	35
16	Indoor Climate Control	33
17	Version Control with Git	32
18	Big Data & Cloud Tools	23
19	Network Security Fundamentals	19
20	Electrical Systems & Safety	18
21	Intro to BIM & 3D Modeling	18
22	Project Coordination	17
23	SQL & Data Modeling	15

```sql
SET search_path TO yrkesco;

SELECT
    c.name AS course,
    COUNT(DISTINCT se.student_id) AS student_count
FROM course c
JOIN course_enrollment ce ON c.course_id = ce.course_id
JOIN student_enrollment se ON ce.course_id = se.course_id
GROUP BY c.name
ORDER BY student_count DESC, c.name;
```

3 rows returned

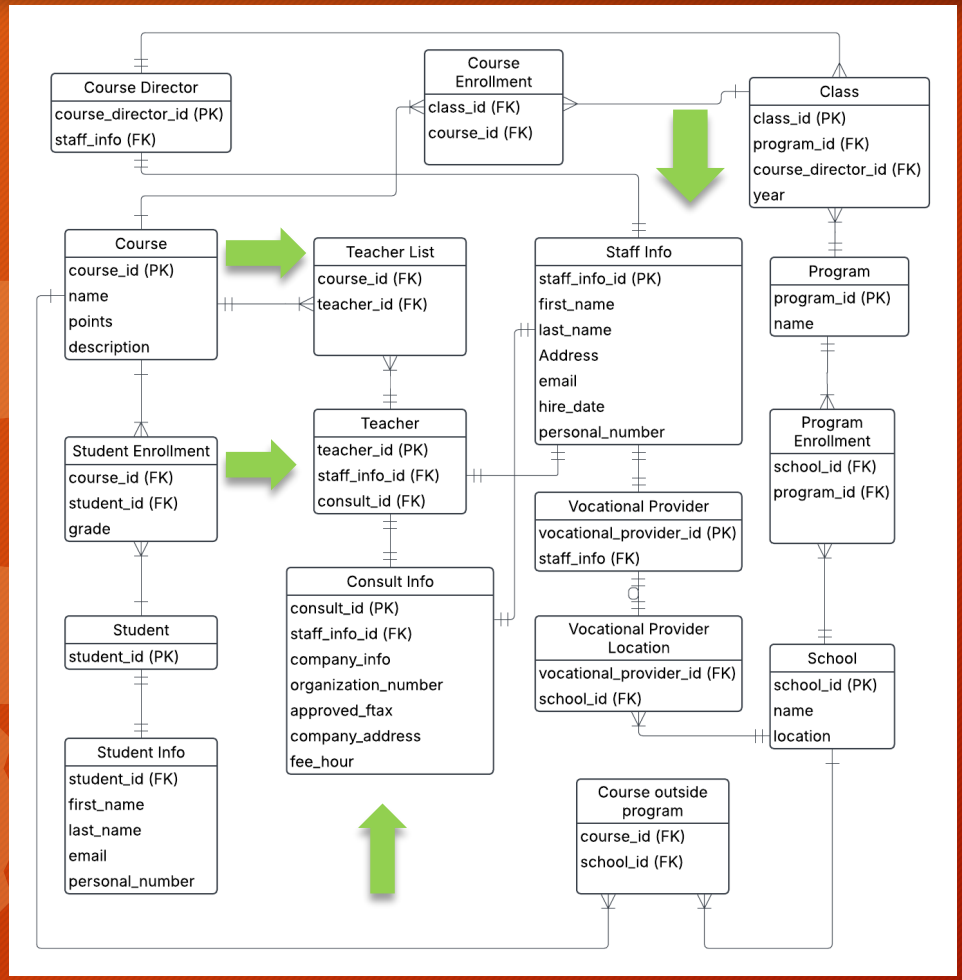
	school character varying	course_name character varying	num_students bigint
1	YrkesCo Göteborg	Team Collaboration & Agile	10
2	YrkesCo Malmö	Workplace Ethics & Law	10
3	YrkesCo Stockholm	Digital Communication Tools	20

```sql
SET search_path TO yrkesco;

SELECT
    s.name AS school,
    c.name AS course_name,
    COUNT(se.student_id) AS num_students
FROM student_enrollment se
JOIN course c ON se.course_id = c.course_id
JOIN course_outside_program cop ON se.course_id = cop.course_id
JOIN school s ON cop.school_id = s.school_id
GROUP BY s.name, c.name
ORDER BY s.name, c.name;
```

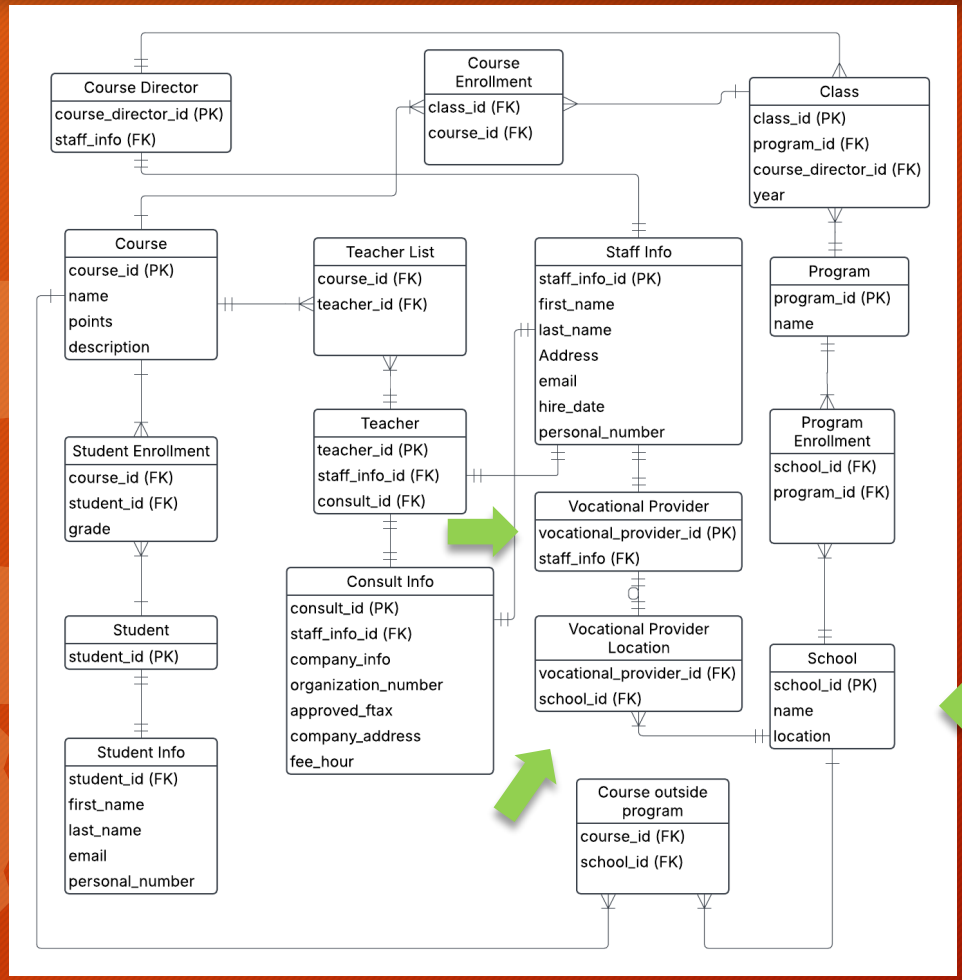
Erik Unevik 2025-04-08

Implementering forts.



Erik Unevik 2025-04-08

Implementering forts.



Erik Unevik 2025-04-08

Implementering forts.

24 rows returned

	name text	profession text	staff_type text
1	Brooke Leonard	Teacher	Consultant
2	Diana Marshall	Teacher	Consultant
3	James Walters	Teacher	Consultant
4	Joshua Jones	Teacher	Consultant
5	Lisa Mcclain	Teacher	Consultant
6	Alice Nilsson	Course Director	Hired Staff
7	Bob Svensson	Course Director	Hired Staff
8	Carla Larsson	Course Director	Hired Staff
9	David Andersson	Course Director	Hired Staff
10	Ella Johansson	Course Director	Hired Staff
11	Fredrik Ek	Course Director	Hired Staff
12	Greta Lund	Course Director	Hired Staff
13	Albin Wallin	Teacher	Hired Staff
14	Anton Engström	Teacher	Hired Staff
15	Emma Åberg	Teacher	Hired Staff
16	Filip Lindström	Teacher	Hired Staff
17	Greta Nyberg	Teacher	Hired Staff
18	Johan Söderberg	Teacher	Hired Staff
19	Malin Ek	Teacher	Hired Staff
20	Mikael Dahl	Teacher	Hired Staff
21	Nora Forsberg	Teacher	Hired Staff
22	Saga Ström	Teacher	Hired Staff
23	Eva Andersson	Vocational Provider	Hired Staff
24	Lars Berg	Vocational Provider	Hired Staff

```sql
SELECT
    s.first_name || ' ' || s.last_name AS name,
    CASE
        WHEN cd.course_director_id IS NOT NULL THEN 'Course Director'
        WHEN vp.vocational_provider_id IS NOT NULL THEN 'Vocational Provider'
        WHEN t.teacher_id IS NOT NULL THEN 'Teacher'
        ELSE 'Staff'
    END AS profession,
    CASE
        WHEN ci.consult_info_id IS NOT NULL THEN 'Consultant'
        ELSE 'Hired Staff'
    END AS staff_type
FROM yrkesco.staff_info s
LEFT JOIN yrkesco.consult_info ci ON s.staff_info_id = ci.staff_info_id
LEFT JOIN yrkesco.teacher t
    ON t.staff_info_id = s.staff_info_id OR (ci.consult_info_id IS NOT NULL AND t.consult_info_id
LEFT JOIN yrkesco.course_director cd ON cd.staff_info_id = s.staff_info_id
LEFT JOIN yrkesco.vocational_provider vp ON vp.staff_info_id = s.staff_info_id
ORDER BY staff_type, profession, name;
```

2 rows returned

	vocational_provider_id integer	provider_name text	schools text
1	1	Eva Andersson	YrkesCo Stockholm, YrkesCo Göteborg
2	2	Lars Berg	YrkesCo Malmö

```sql
SET search_path TO yrkesco;

SELECT
    vp.vocational_provider_id,
    si.first_name || ' ' || si.last_name AS provider_name,
    STRING_AGG(s.name, ', ') AS schools
FROM vocational_provider_location vpl
JOIN vocational_provider vp ON vp.vocational_provider_id = vpl.vocational_provider_id
JOIN staff_info si ON vp.staff_info_id = si.staff_info_id
JOIN school s ON vpl.school_id = s.school_id
GROUP BY vp.vocational_provider_id, si.first_name, si.last_name;
```

Sammanfattningsvis

-> Jag har nu skapat en säkerdatabas där man kan addera, uppdatera och ta bort uppgifter utan att onödig data tas bort eller läggs till

-> Databasen kan således generera effektivisering av administrering och göra tidsbesparingar åt YrkesCo (…)

Erik Unevik 2025-04-08

Tack för mig ☺!

Erik Unevik 2025-04-08

Dataintegritet i databsen är säkerställd genom:

- Alla tabeller har primära nycklar
- Det föreligger referentiell integritet med korrekt utplacerade utländska nycklar (FK) i refererade tabeller
- Det föreligger domän integritet då varje kolumn har lämplig datatyp
- Databasen följer definerade affärsregler
- Den uppfyller normaliseringsgraden 3NF

Erik Unevik 2025-04-08