CREATE (n1:Student {Student\_ID:1, First\_Name:'Ana',Middle\_Name:'Maria',Last\_Name:'Doe'})

CREATE (n2:Student{Student\_ID:2,First\_Name:'Peter',Middle\_Name:'John',Last\_Name:'Ung'})

CREATE (n3:Student {Student\_ID:3,First\_Name:'John',Middle\_Name:'',Last\_Name:'Doe'})

CREATE (n4:Student {Student\_ID:4,First\_Name:'Stine',Middle\_Name:'',Last\_Name:'Berre'})

CREATE (n5:Student {Student\_ID:5,First\_Name:'John',Middle\_Name:'',Last\_Name:'Travolta'})

CREATE (n6:Course {Course\_Number:1,Course\_Name:'Databases'})

CREATE (n7:Course {Course\_Number:2,Course\_Name:'Programming'})

CREATE (n8:Project {Project\_Number:34,Project\_Name:'eCommerce database'})

CREATE (n9:Project {Project\_Number:24,Project\_Name:'eCommerce website'})

CREATE (n10:Project {Project\_Number:26,Project\_Name:'Reporting'})

CREATE (n11:Project {Project\_Number:13,Project\_Name:'User interface'})

CREATE (n12:Room {Room\_ID:1,Room\_Name:'Pascal'})

CREATE (n13:Room {Room\_ID:3,Room\_Name:'Alpha'})

CREATE (n14:Room {Room\_ID:4,Room\_Name:'Beta'})

CREATE (n15:Room {Room\_ID:2,Room\_Name:'Seminar C'})

MATCH (a:Student{Student\_ID: 1}), (b:Course {Course\_Number: 1})

CREATE (a)-[:Enrolled\_IN]->(b)

MATCH (c:Student{Student\_ID: 2}), (d:Course {Course\_Number: 1})

CREATE (c)-[:Enrolled\_IN]->(d)

MATCH (e:Student{Student\_ID: 4}), (f:Course {Course\_Number: 1})

CREATE (e)-[:Enrolled\_IN]->(f)

MATCH (f:Student{Student\_ID: 3}), (g:Course {Course\_Number: 2})

CREATE (f)-[:Enrolled\_IN]->(g)

MATCH (h:Student{Student\_ID: 1}), (i:Project{Project\_Number: 34})

CREATE (h)-[:`Works\_On` {Hours:'1'}]->(i)

MATCH (j:Student{Student\_ID: 2}), (k:Project{Project\_Number: 34})

CREATE (j)-[:`Works\_On` {Hours:'3'}]->(k)

MATCH (l:Student{Student\_ID: 3}), (m:Project{Project\_Number: 34})

CREATE (l)-[:`Works\_On` {Hours:'1'}]->(m)

MATCH (n:Student{Student\_ID: 1}), (o:Project{Project\_Number: 24})

CREATE (n)-[:`Works\_On` {Hours:'2'}]->(o)

MATCH (p:Student{Student\_ID: 2}), (q:Project{Project\_Number: 24})

CREATE (p)-[:`Works\_On` {Hours:'4'}]->(q)

MATCH (r:Student{Student\_ID: 3}), (t:Project{Project\_Number: 24})

CREATE (r)-[:`Works\_On` {Hours:'2'}]->(t)

MATCH (s:Student{Student\_ID: 2}), (w:Project{Project\_Number: 26})

CREATE (s)-[:`Works\_On` {Hours:'1'}]->(w)

MATCH (u1:Student{Student\_ID: 3}), (w1:Project{Project\_Number: 26})

CREATE (u1)-[:`Works\_On` {Hours:'3'}]->(w1)

MATCH (v:Student{Student\_ID: 2}), (x:Project{Project\_Number: 13})

CREATE (v)-[:`Works\_On` {Hours:'3'}]->(x)

MATCH (y:Course{Course\_Number: 1}), (z:Room{Room\_ID: 1})

CREATE (y)-[:`Takes\_Place\_In`]->(z)

MATCH (y1:Course{Course\_Number: 1}), (z1:Room{Room\_ID: 3})

CREATE (y1)-[:`Takes\_Place\_In`]->(z1)

MATCH (y2:Course{Course\_Number: 1}), (z2:Room{Room\_ID: 4})

CREATE (y2)-[:`Takes\_Place\_In`]->(z2)

MATCH (y3:Course{Course\_Number: 2}), (z3:Room{Room\_ID: 2})

CREATE (y3)-[:`Takes\_Place\_In`]->(z3)

Q1) MATCH (c:Course {Course\_Number: 1})-[:Takes\_Place\_In]->(r:Room)

RETURN c.Course\_Name AS Course\_Name, r.Room\_Name AS Room\_Name

| **Course\_Name** | **Room\_Name** |
| --- | --- |
| **1** | "Databases" | "Pascal" |
| **2** | "Databases" | "Alpha" |
| **3** | "Databases" | "Beta" |

SQL query:

SELECT c.Course\_Name, r.Room\_Name

FROM Courses c

INNER JOIN Rooms r ON c.Room\_ID = r.Room\_ID

WHERE c.Course\_Number = 1;

Q2)

MATCH (s:Student)-[w:Works\_On]->(p:Project)

WHERE s.`Student\_ID` = 1

RETURN s.First\_Name, p.Project\_Name, w.Hours

| **s.First\_Name** | **p.Project\_Name** | **w.Hours** |
| --- | --- | --- |
| **1** | "Ana" | "eCommerce website" | "2" |
| **2** | "Ana" | "eCommerce database" | "1" |

SQL Query:

SELECT s.First\_Name, p.Project\_Name, w.Hours

FROM Student s

JOIN Works\_On w ON s.`Student ID` = w.`Student ID`

JOIN Project p ON w.Project\_Number = p.Project\_Number

WHERE s.`Student ID` = 1;

Q3)

MATCH (s:Student)-[w:Works\_On]->(p:Project {Project\_Number: 24})

RETURN p.Project\_Name, s.Last\_Name, w.Hours

Or

MATCH (s:Student)-[w:Works\_On]->(p:Project)

WHERE p.Project\_Number = 24

RETURN p.Project\_Name, s.Last\_Name, w.Hours

| **p.Project\_Name** | **s.Last\_Name** | **w.Hours** |
| --- | --- | --- |
| **1** | "eCommerce website" | "Doe" | "2" |
| **2** | "eCommerce website" | "Ung" | "4" |
| **3** | "eCommerce website" | "Doe" | "2" |

SQL query:

SELECT p.Project\_Name, s.Last\_Name, w.Hours

FROM Project p

JOIN Works\_On w ON p.Project\_Number = w.Project\_Number

JOIN Student s ON w.Student\_ID = s.Student\_ID

WHERE p.Project\_Number = 24;

Q4) How can we ordered by name?!

MATCH (s:Student)-[w:Works\_On]->(p:Project)

WHERE w.Hours IS NOT NULL

RETURN s.Last\_Name, p.Project\_Name, w.Hours

LIMIT 4

| **s.Last\_Name** | **p.Project\_Name** | **w.Hours** |
| --- | --- | --- |
| **1** | "Doe" | "eCommerce website" | "2" |
| **2** | "Doe" | "eCommerce database" | "1" |
| **3** | "Ung" | "User interface" | "3" |
| **4** | "Ung" | "Reporting" | "1" |

SQL query:

SELECT s.last\_name, p.project\_name, w.hours

FROM works\_on w

JOIN student s ON s.student\_id = w.student\_id

JOIN project p ON p.project\_number = w.project\_number

ORDER BY s.last\_name

LIMIT 4;

Q5)

MATCH (s:Student)-[w:Works\_On]->(p:Project)

WITH s, COUNT(p) as num\_projects

WHERE num\_projects > 2

RETURN s.Last\_Name as Last\_Name, num\_projects

ORDER BY num\_projects

| **Last\_Name** | **num\_projects** |
| --- | --- |
| **1** | "Doe" | 3 |
| **2** | "Ung" | 4 |

SQL Query:

SELECT

students.last\_name,

COUNT(\*) AS num\_projects

FROM

works\_on

INNER JOIN students ON works\_on.student\_id = students.student\_id

GROUP BY

works\_on.student\_id, students.last\_name

HAVING

COUNT(\*) > 2

ORDER BY

num\_projects;

Q6)

MATCH (s1:Student)-[w1:Works\_On]->(p:Project)<-[w2:Works\_On]-(s2:Student)

WHERE s1.Last\_Name = s2.Last\_Name AND w1.Hours = w2.Hours

RETURN s1.First\_Name, p.Project\_Name

| **s1.First\_Name** | **p.Project\_Name** |
| --- | --- |
| **1** | "John" | "eCommerce website" |
| **2** | "John" | "eCommerce database" |
| **3** | "Ana" | "eCommerce website" |
| **4** | "Ana" | "eCommerce database" |

SQL query:

SELECT s1.first\_name, s2.first\_name, p.project\_name

FROM works\_on w1

JOIN works\_on w2 ON w1.project\_number = w2.project\_number AND w1.student\_id < w2.student\_id

JOIN student s1 ON s1.student\_id = w1.student\_id

JOIN student s2 ON s2.student\_id = w2.student\_id AND s1.last\_name = s2.last\_name

JOIN project p ON p.project\_number = w1.project\_number

ORDER BY s1.last\_name, s2.last\_name, p.project\_name;