PART 1 – TASK 1

```
JS hw6_part1_task1.mongodb.js > ...
      Currently connected to homework6.uqfhenw.mongodb.net. Click here to change connection.
1     // TASK 1
2     use ('hw6');
3     db.students.find({ "學號": "R10945002" })
4
5
6
7
8
9
10
11
12
13
14
```


```
[
  {
    "_id": {
      "$oid": "64801a0dfc04b88e94d3c05d"
    },
    "身份": "學生",
    "系所": "生醫電資所",
    "年級": 1,
    "學號": "R10945002",
    "姓名": "林柏詠 (LIN, BO-YONG)",
    "信箱": "r10945002@ntu.edu.tw",
    "班別": "資料庫系統-從SQL到NoSQL (EE5178)"
  }
]
```


PART 1 – TASK 2

```
JS hw6_part1_task1.mongodb.js > ...
16    use ('hw6');
17    db.students.find({ "系所": "生醫電資所" })
18
19
20
21
```


```
[
  {
    "_id": {
      "$oid": "64801a0dfc04b88e94d3c05d"
    },
    "身份": "學生",
    "系所": "生醫電資所",
    "年級": 1,
    "學號": "R10945002",
    "姓名": "林柏詠 (LIN, BO-YONG)",
    "信箱": "r10945002@ntu.edu.tw",
    "班別": "資料庫系統-從SQL到NoSQL (EE5178)"
  },
  {
    "_id": {
      "$oid": "64801a0dfc04b88e94d3c05f"
    },
    "身份": "學生",
    "系所": "生醫電資所",
    "年級": 1,
    "學號": "R11945005",
    "姓名": "郭庭沂 (KUO,TING-YI)",
    "信箱": "r11945005@ntu.edu.tw",
    "班別": "資料庫系統-從SQL到NoSQL (EE5178)"
  },
  {
    "_id": {
      "$oid": "64801a0dfc04b88e94d3c060"
    },
    "身份": "學生",
    "系所": "生醫電資所",
    "年級": 1,
    "學號": "R11945018",
    "姓名": "曾于瑄 (YU-HSUAN TSENG)",
    "信箱": "r11945018@ntu.edu.tw",
    "班別": "資料庫系統-從SQL到NoSQL (EE5178)"
  },
  {
    "_id": {
      "$oid": "64801a0dfc04b88e94d3c061"
    },
    "身份": "學生",
    "系所": "生醫電資所",
    "年級": 1,
    "學號": "R11945044",
    "姓名": "張瑜傑 (ZHANG, YU-JIE)",
    "信箱": "r11945044@ntu.edu.tw",
    "班別": "資料庫系統-從SQL到NoSQL (EE5178)"
  }
]
```

PART 1 – TASK 3

hw6_part1_task1.mongodb.js > ...

```
db.students.aggregate([
    {
      $group: {
        _id: { 系所: "$系所", 年級: "$年級" },
        count: { $sum: 1 }
      }
    }
  ]);
```


```
[
  {
    "_id": {
      "系所": "資工系",
      "年級": 2
    },
    "count": 5
  },
  {
    "_id": {
      "系所": "資工系",
      "年級": 4
    },
    "count": 1
  },
  {
    "_id": {
      "系所": "基蛋所",
      "年級": 3
    },
    "count": 1
  },
  {
    "_id": {
      "系所": "資料科學學程",
      "年級": 2
    },
    "count": 2
  },
  {
    "_id": {
      "系所": "物理系",
      "年級": 4
    },
    "count": 2
  },
  {
    "_id": {
      "系所": "土木系水利組",
      "年級": 1
    },
    "count": 2
  },
  {
    "_id": {
      "系所": "生物機電系",
      "年級": 4
    },
    "count": 1
  },
  {
    "_id": {
      "系所": "資管系",
      "年級": 2
    },
    "count": 3
  },
  {
    "_id": {
      "系所": "電機系",
      "年級": 1
    },
    "count": 16
  },
  {
    "_id": {
      "系所": "機械系系控組",
      "年級": 1
    },
    "count": 1
  },
  {
    "_id": {
      "系所": "土木系電輔組",
      "年級": 1
    },
    "count": 3
  },
  {
    "_id": {
      "系所": "電機系",
      "年級": 2
    },
    "count": 2
  },
  {
    "_id": {
      "系所": "基蛋所",
      "年級": 2
    },
    "count": 1
  },
```

PART 1 – TASK 4

hw6_part1_task1.mongodb.js > ...

```
db.students.insertMany([
  {
    身份: "旁聽生",
    系所: "電機所",
    年級: 2,
    學號: "R10123456",
    姓名: "小紅",
    信箱: "r10123456@ntu.edu.tw",
    join_date: "2023-06-02",
  },
  {
    身份: "學生",
    系所: "物理系",
    年級: 3,
    學號: "B09987653",
    姓名: "小黃",
    信箱: "b09987653@ntu.edu.tw",
    join_date: "2023-06-02",
  },
  {
    身份: "觀察者",
    系所: "電信所",
    年級: 1,
    學號: "R11123001",
    姓名: "小綠",
    信箱: "r11123001@ntu.edu.tw",
    join_date: "2023-06-02",
  },
]);
db.students.find({
    $or: [
      { 學號: "R10945002" },
      { join_date: "2023-06-02" }
    ]
  });

```


```
[
  {
    "_id": {
      "$oid": "64801a0dfc04b88e94d3c05d"
    },
    "身份": "學生",
    "系所": "生醫電資所",
    "年級": 1,
    "學號": "R10945002",
    "姓名": "林柏詠 (LIN, BO-YONG)",
    "信箱": "r10945002@ntu.edu.tw",
    "班別": "資料庫系統-從SQL到NoSQL (EE5178)",
    "join_date": "2023-03-01"
  },
  {
    "_id": {
      "$oid": "648034e3dd27123e04da4fd0"
    },
    "身份": "旁聽生",
    "系所": "電機所",
    "年級": 2,
    "學號": "R10123456",
    "姓名": "小紅",
    "信箱": "r10123456@ntu.edu.tw",
    "join_date": "2023-06-02"
  },
  {
    "_id": {
      "$oid": "648034e3dd27123e04da4fd1"
    },
    "身份": "學生",
    "系所": "物理系",
    "年級": 3,
    "學號": "B09987653",
    "姓名": "小黃",
    "信箱": "b09987653@ntu.edu.tw",
    "join_date": "2023-06-02"
  },
  {
    "_id": {
      "$oid": "648034e3dd27123e04da4fd2"
    },
    "身份": "觀察者",
    "系所": "電信所",
    "年級": 1,
    "學號": "R11123001",
    "姓名": "小綠",
    "信箱": "r11123001@ntu.edu.tw",
    "join_date": "2023-06-02"
  }
]
```

PART 1 – TASK 5

hw6_part1_task1.mongodb.js > ...

```
db.students.updateMany({}, { $set: { join_date: "2023-03-01" } });
db.students.find({ 系所: "生醫電資所" });
```


```
[
  {
    "_id": {
      "$oid": "64801a0dfc04b88e94d3c05d"
    },
    "身份": "學生",
    "系所": "生醫電資所",
    "年級": 1,
    "學號": "R10945002",
    "姓名": "林柏詠 (LIN, BO-YONG)",
    "信箱": "r10945002@ntu.edu.tw",
    "班別": "資料庫系統-從SQL到NoSQL (EE5178)",
    "join_date": "2023-03-01"
  },
  {
    "_id": {
      "$oid": "64801a0dfc04b88e94d3c05f"
    },
    "身份": "學生",
    "系所": "生醫電資所",
    "年級": 1,
    "學號": "R11945005",
    "姓名": "郭庭沂 (KUO,TING-YI)",
    "信箱": "r11945005@ntu.edu.tw",
    "班別": "資料庫系統-從SQL到NoSQL (EE5178)",
    "join_date": "2023-03-01"
  },
  {
    "_id": {
      "$oid": "64801a0dfc04b88e94d3c060"
    },
    "身份": "學生",
    "系所": "生醫電資所",
    "年級": 1,
    "學號": "R11945018",
    "姓名": "曾于瑄 (YU-HSUAN TSENG)",
    "信箱": "r11945018@ntu.edu.tw",
    "班別": "資料庫系統-從SQL到NoSQL (EE5178)",
    "join_date": "2023-03-01"
  },
  {
    "_id": {
      "$oid": "64801a0dfc04b88e94d3c061"
    },
    "身份": "學生",
    "系所": "生醫電資所",
    "年級": 1,
    "學號": "R11945044",
    "姓名": "張瑜倢 (ZHANG, YU-JIE)",
    "信箱": "r11945044@ntu.edu.tw",
    "班別": "資料庫系統-從SQL到NoSQL (EE5178)",
    "join_date": "2023-03-01"
  }
]
```

PART 1 – TASK 6.1

hw6_part1_task1.mongodb.js > ...

```
var queryDate = "2023-03-31";
var updateSessionStats = function (queryDate) {
  db.students.aggregate([
    {
      $match: {
        join_date: { $lt: queryDate },
      },
    },
    {
      $group: {
        _id: { 系所: "$系所", 年級: "$年級" },
        count: { $sum: 1 },
      },
    },
    {
      $project: {
        value: {
          count: "$count",
        },
      },
    },
    {
      $merge: {
        into: "tally",
        whenMatched: [
          {
            $set: {
              "value.count": { $add: ["$value.count", "$$new.value.
              count"] },
            },
          },
        ],
        whenNotMatched: "insert",
      },
    },
  ]);
};
updateSessionStats(queryDate);
db.tally.find({ "_id.系所": { $in: ["電機所", "物理系", "電信所"] } });
```

```
[
  {
    "_id": {
      "系所": "電信所",
      "年級": 1
    },
    "value": {
      "count": 3
    }
  },
  {
    "_id": {
      "系所": "電信所",
      "年級": 2
    },
    "value": {
      "count": 3
    }
  },
  {
    "_id": {
      "系所": "物理系",
      "年級": 4
    },
    "value": {
      "count": 2
    }
  }
]
```

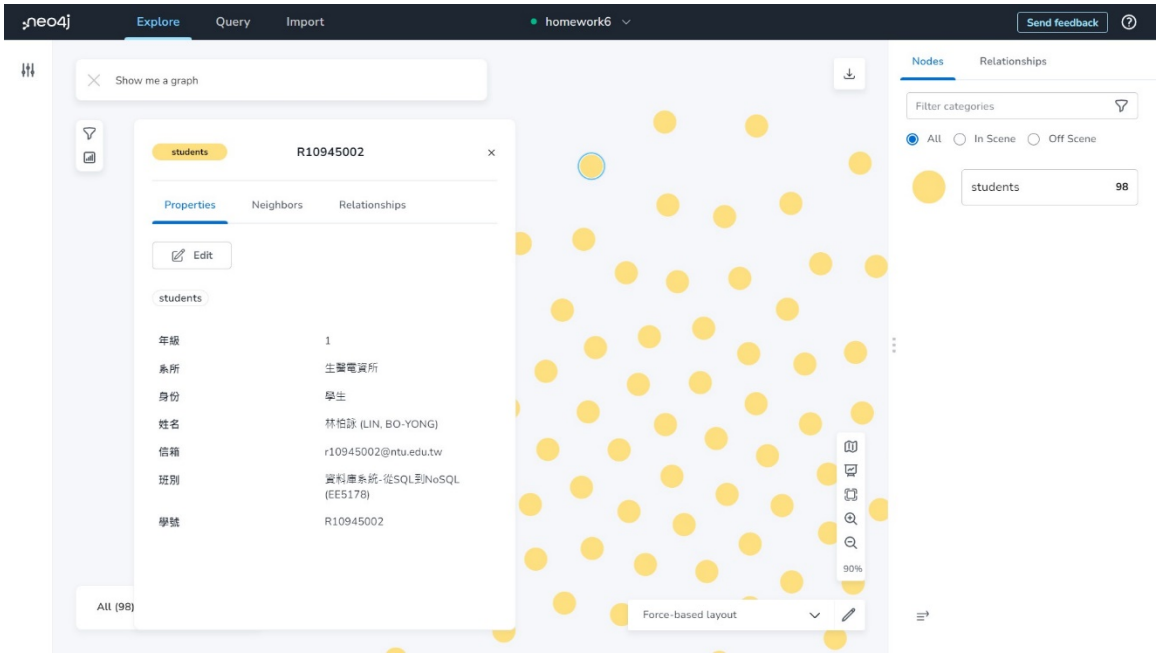
PART 1 – TASK 6.2

hw6_part1_task1.mongodb.js > ...

```
var queryDate = "2023-06-10";
var updateSessionStats = function (queryDate) {
  db.students.aggregate([
    {
      $match: {
        join_date: { $lt: queryDate },
      },
    },
    {
      $group: {
        _id: { 系所: "$系所", 年級: "$年級" },
        count: { $sum: 1 },
      },
    },
    {
      $project: {
        value: {
          count: "$count",
        },
      },
    },
    {
      $merge: {
        into: "tally",
        whenMatched: [
          {
            $set: {
              "value.count": { $add: ["$value.count", "$$new.value.
              count"] },
            },
          },
        ],
        whenNotMatched: "insert",
      },
    },
  ]);
};
updateSessionStats(queryDate);
db.tally.find({ "_id.系所": { $in: ["電機所", "物理系", "電信所"] } });
```

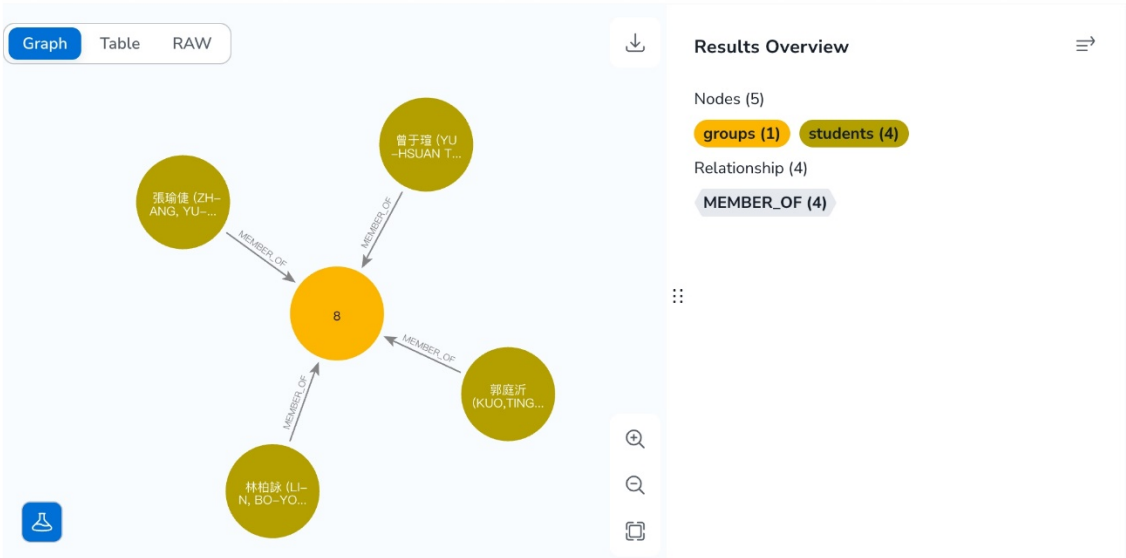
```
[
  {
    "_id": {
      "系所": "電機所",
      "年級": 2
    },
    "value": {
      "count": 1
    }
  },
  {
    "_id": {
      "系所": "物理系",
      "年級": 4
    },
    "value": {
      "count": 2
    }
  },
  {
    "_id": {
      "系所": "電信所",
      "年級": 2
    },
    "value": {
      "count": 3
    }
  },
  {
    "_id": {
      "系所": "電信所",
      "年級": 1
    },
    "value": {
      "count": 4
    }
  },
  {
    "_id": {
      "系所": "物理系",
      "年級": 3
    },
    "value": {
      "count": 1
    }
  }
]
```

PART 2 – TASK 1

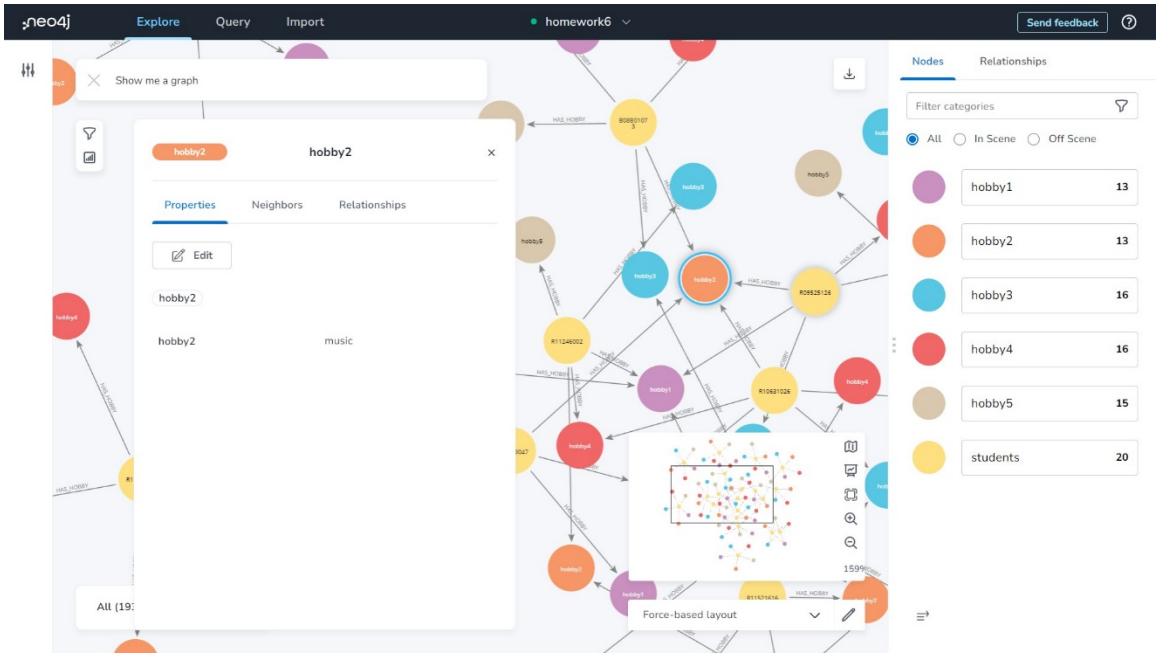


PART 2 – TASK 3

```
1  CREATE (g:groups {group: 8})
2  WITH g
3  MATCH (s1:students {`學號`: 'R10945002'}),
4        (s2:students {`學號`: 'R11945044'}),
5        (s3:students {`學號`: 'R11945005'}),
6        (s4:students {`學號`: 'R11945018'})
7  CREATE p1=(s1)-[:MEMBER_OF]→(g),
8         p2=(s2)-[:MEMBER_OF]→(g),
9         p3=(s3)-[:MEMBER_OF]→(g),
10        p4=(s4)-[:MEMBER_OF]→(g)
11 RETURN *
```

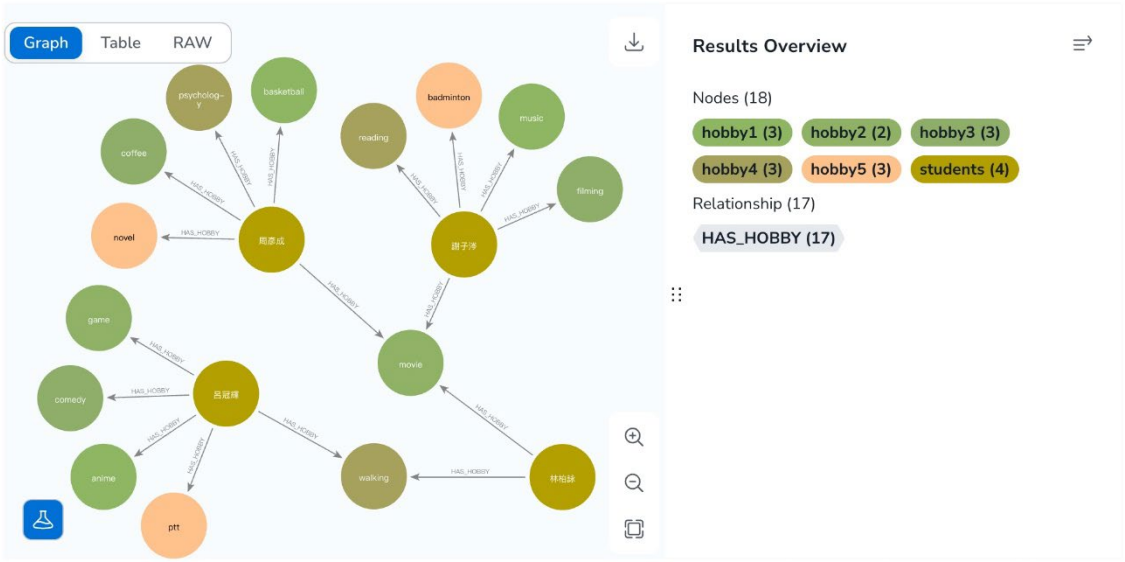


PART 3 – TASK 1



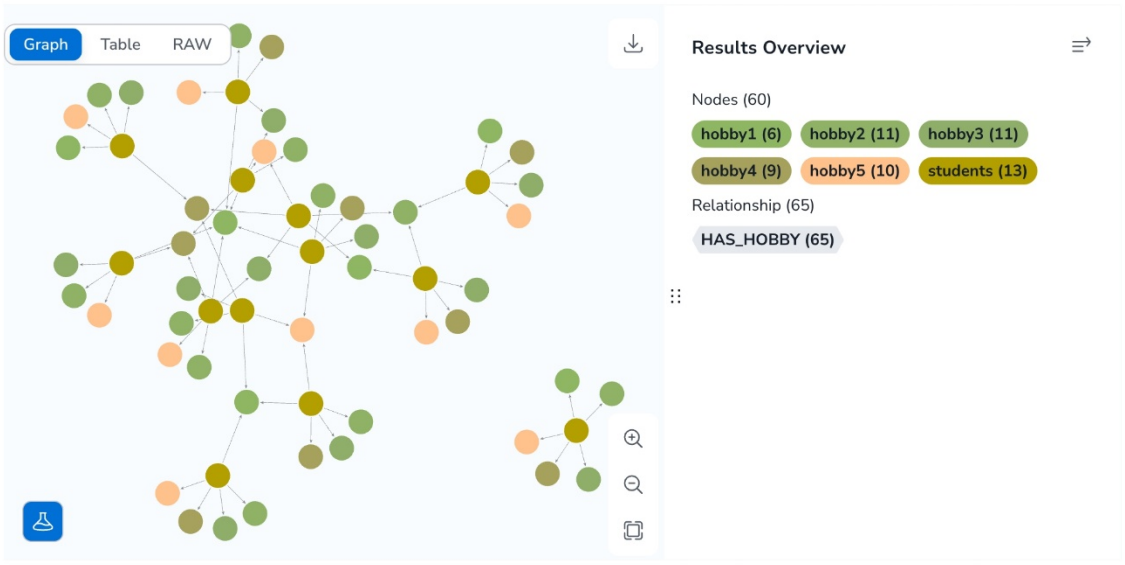
PART 3 – TASK 2

```
1 MATCH hf=(me:students {`學號`: 'R10945002'})-[:HAS_HOBBY]→(h)←
  [:HAS_HOBBY]-(other:students)
2 MATCH hfh=(other:students)-[:HAS_HOBBY]→(h2)
3 RETURN *
```

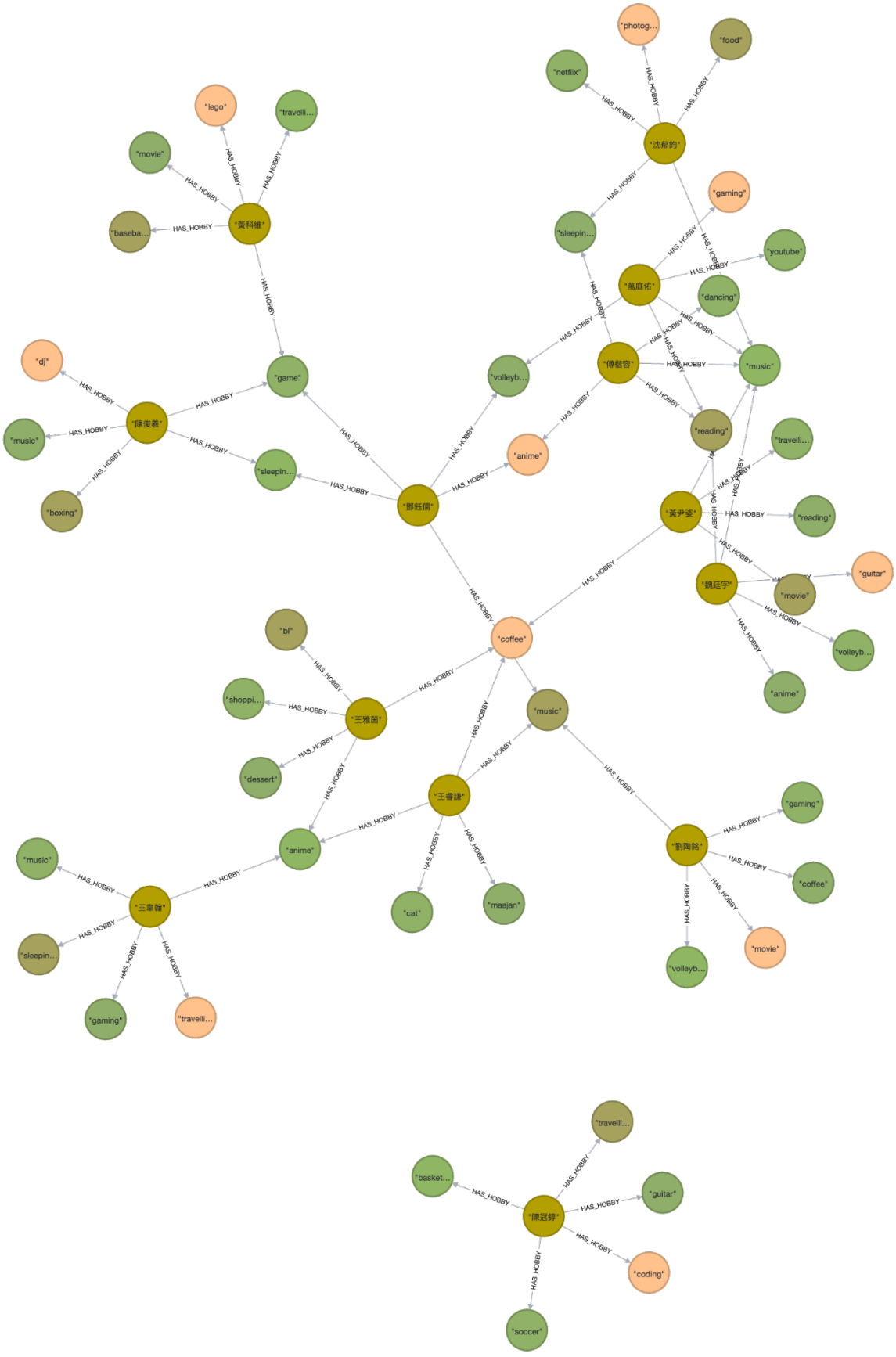


PART 3 – TASK 3

```
1 MATCH p1=(me:students {`學號`: 'R10945002'})-[:HAS_HOBBY]→(h)←
  [:HAS_HOBBY]-(hf:students)
2 MATCH p2=(hf:students)-[:HAS_HOBBY]→(h2)←[:HAS_HOBBY]-
  (foaf:students)
3 MATCH p3=(foaf)-[:HAS_HOBBY]→(h3)
4 WHERE me <> foaf AND NOT EXISTS((me)-[:HAS_HOBBY]→()-[:HAS_HOBBY]-
  (foaf))
5 RETURN p3
```

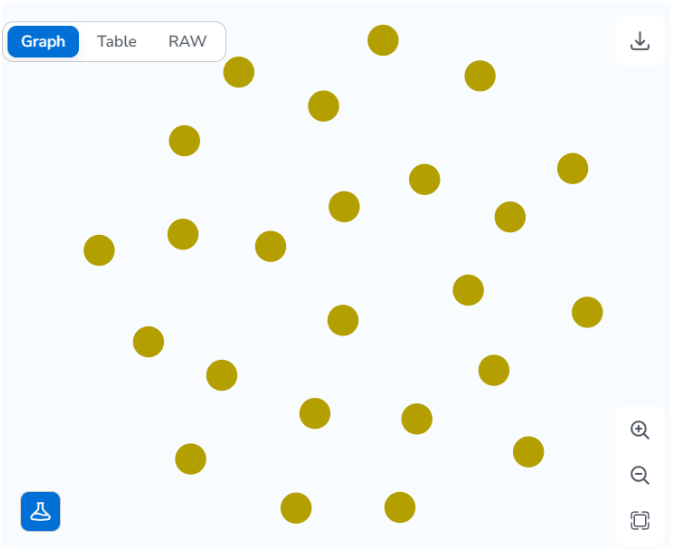


Started streaming 80 records after 2ms and completed after 7ms.


"photog..."
"food"
"netflix"
"沈郁鈞"
"lego"
"travelli..."
"movie"
"黃科維"
"baseba..."
"gaming"
"sleepin..."
"youtube"
"萬庭佑"
"dancing"
"dj"
"game"
"volleyb..."
"傅楷容"
"music"
"陳俊義"
"music"
"reading"
"boxing"
"sleepin..."
"anime"
"travelli..."
"鄧鈺倩"
"黃尹姿"
"reading"
"guitar"
"魏廷宇"
"movie"
"volleyb..."
"bl"
"coffee"
"anime"
"shoppi..."
"王雅茵"
"music"
"dessert"
"王睿謙"
"music"
"anime"
"gaming"
"劉陶銘"
"coffee"
"王韋翰"
"cat"
"maajan"
"movie"
"sleepin..."
"volleyb..."
"gaming"
"travelli..."
"travelli..."
"basket..."
"陳冠鋒"
"guitar"
"coding"
"soccer"

PART 3 – TASK 4

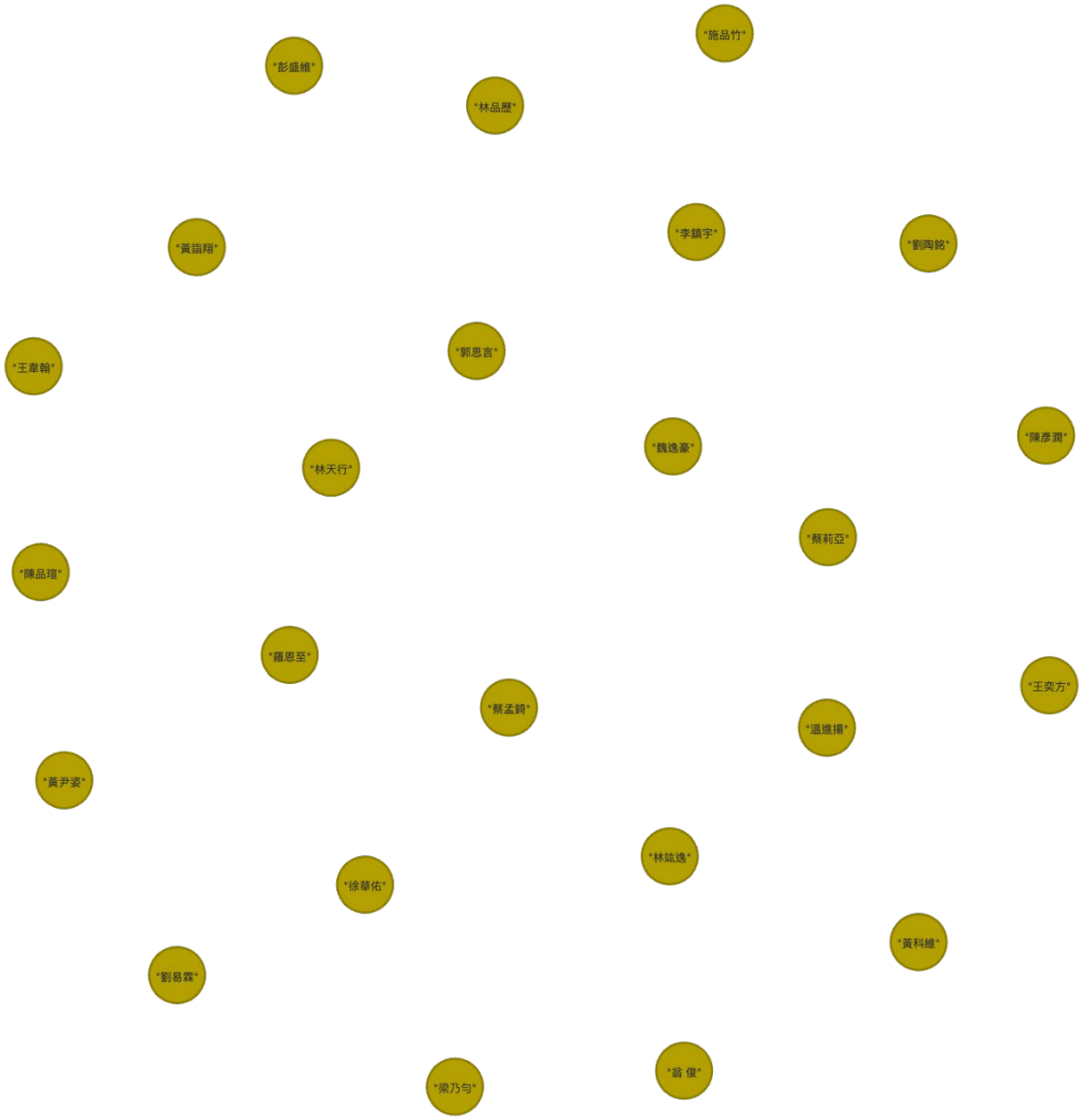
```
1 MATCH (g:students)-[:HAS_HOBBY]→(h)←[:HAS_HOBBY]-(foaf2:students)
2 WHERE g.`學號` IN ['R11945044', 'R11945005', 'R11945018']
3 WITH collect(DISTINCT g) AS gList, collect(DISTINCT foaf2) AS foaf2List
4 RETURN [foaf2 IN foaf2List WHERE NOT foaf2 IN gList] AS foaf2
```



Results Overview

Nodes (24)

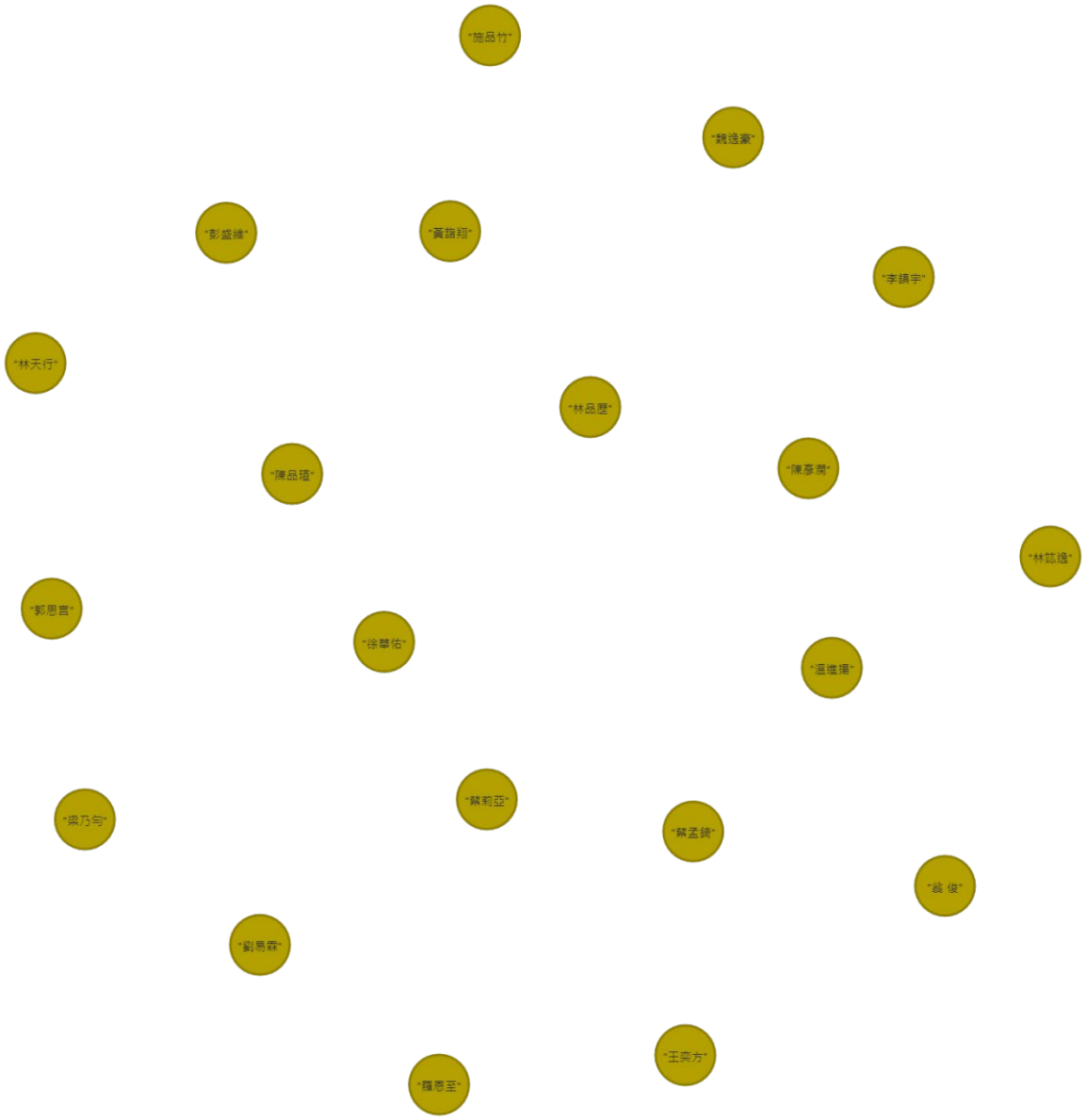
students (24)


"施品竹"
"彭盛維"
"林品歷"
"李鎮宇"
"黃詣翔"
"劉陶銘"
"郭思言"
"王韋翰"
"陳彥澗"
"魏逸豪"
"林天行"
"蔡莉亞"
"陳品瑄"
"羅恩至"
"王奕方"
"蔡孟錡"
"溫雅揚"
"黃尹姿"
"林竑逸"
"徐華佑"
"黃科維"
"劉易霖"
"翁 俊"
"梁乃勻"

PART 3 – TASK 5

```
MATCH p1=(me:students {`學號`: 'R10945002'})-[:HAS_HOBBY]→(h)←[:HAS_HOBBY]-(hf:students)
MATCH p2=(hf:students)-[:HAS_HOBBY]→(h2)←[:HAS_HOBBY]-(foaf:students)
MATCH p3=(foaf)-[:HAS_HOBBY]→(h3)
WHERE me <> foaf AND NOT EXISTS((me)-[:HAS_HOBBY]→()-[:HAS_HOBBY]-(foaf))
WITH foaf

MATCH (g:students)-[:HAS_HOBBY]→(h)←[:HAS_HOBBY]-(foaf2:students)
WHERE g.`學號` IN ['R11945044', 'R11945005', 'R11945018']
WITH collect(DISTINCT g) AS gList, collect(DISTINCT foaf2) AS foaf2List,
collect(DISTINCT foaf) AS foafList
RETURN [foaf2 IN foaf2List WHERE NOT foaf2 IN gList AND NOT foaf2 IN foafList]
AS foaf2
```


"施品竹"
"魏逸豪"
"彭盛維"
"黃鎮翔"
"李鎮宇"
"林天行"
"林品歷"
"陳品瑄"
"陳彥閎"
"林筑逸"
"郭思言"
"徐華佑"
"溫維揚"
"蔡莉亞"
"梁乃勻"
"蔡孟錡"
"翁俊"
"劉易霖"
"王奕方"
"羅恩至"