

Part 1-1

```
> use hw6
< switched to db hw6
> db.students.find({"學號":"R11945005"})
< {
  _id: ObjectId("647d6710ceea0aeec9d870a3"),
  '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)'
}
```

Part 1-2

```
> db.students.find({"學號":{"$in":["R11945005","R10945002","R11945018","R11945044"]}})
< {
  _id: ObjectId("647d6710ceea0aeec9d870a2"),
  '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: ObjectId("647d6710ceea0aeec9d870a3"),
  '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: ObjectId("647d6710ceea0aeec9d870a4"),
  '身份': '學生',
  '系所': '生醫電資所',
  '年級': 1,
  '學號': 'R11945018',
  '姓名': '曾于瑤 (YU-HSUAN TSENG)',
  '信箱': 'r11945018@ntu.edu.tw',
  '班別': '資料庫系統-從SQL到NoSQL (EE5178)'
}
{
  _id: ObjectId("647d6710ceea0aeec9d870a5"),
  '身份': '學生',
  '系所': '生醫電資所',
  '年級': 1,
  '學號': 'R11945044',
  '姓名': '張瑜健 (ZHANG, YU-JIE)',
  '信箱': 'r11945044@ntu.edu.tw',
  '班別': '資料庫系統-從SQL到NoSQL (EE5178)'
}
```

Part 1-3

```

> db.students.aggregate([
  {
    $group: {
      _id: {
        年級: "$年級",
        系所: "$系所"
      },
      count: { $sum: 1 }
    }
  })
< [
  {
    _id: {
      '年級': 2,
      '系所': '資料科學學程'
    },
    count: 2
  },
  {
    _id: {
      '年級': 2,
      '系所': '資管系'
    },
    count: 3
  }
]

[
  {
    _id: {
      '年級': 6,
      '系所': '電機系'
    },
    count: 1
  },
  {
    _id: {
      '年級': 2,
      '系所': '統計碩士學程'
    },
    count: 2
  },
  {
    _id: {
      '年級': 4,
      '系所': '心理系'
    },
    count: 2
  }
]

[
  {
    _id: {
      '年級': 2,
      '系所': '心理系一般組'
    },
    count: 1
  },
  {
    _id: {
      '年級': 1,
      '系所': '電信所'
    },
    count: 3
  },
  {
    _id: {
      '年級': 2,
      '系所': '資工系'
    },
    count: 5
  }
]

[
  {
    _id: {
      '年級': 4,
      '系所': '機械系'
    },
    count: 1
  },
  {
    _id: {
      '年級': 4,
      '系所': '經濟系'
    },
    count: 4
  },
  {
    _id: {
      '年級': 2,
      '系所': '基經所'
    },
    count: 1
  }
]

[
  {
    _id: {
      '年級': 3,
      '系所': '工科海洋系'
    },
    count: 1
  },
  {
    _id: {
      '年級': 1,
      '系所': '電機系'
    },
    count: 16
  },
  {
    _id: {
      '年級': 2,
      '系所': '農經系'
    },
    count: 1
  }
]

[
  {
    _id: {
      '年級': 2,
      '系所': '土木系水利組'
    },
    count: 1
  },
  {
    _id: {
      '年級': 2,
      '系所': '電機資安碩班'
    },
    count: 1
  },
  {
    _id: {
      '年級': 1,
      '系所': '生醫電資所'
    },
    count: 4
  }
]

[
  {
    _id: {
      '年級': 1,
      '系所': '統計碩士學程'
    },
    count: 2
  },
  {
    _id: {
      '年級': 3,
      '系所': '電機系'
    },
    count: 4
  },
  {
    _id: {
      '年級': 2,
      '系所': '國企系'
    },
    count: 1
  }
]

```

.....(not finished)

Part 1-4

```

db.students.updateMany({}, { $set: { join_date: "2023-03-01" } })
{
  acknowledged: true,
  insertedId: null,
  matchedCount: 98,
  modifiedCount: 98,
  upsertedCount: 0
}
db.students.find({"學號": {$in: ["R11945005", "R10945002", "R11945018", "R11945044"]}})
{
  _id: ObjectId("647d6710ceea0aee9d870a2"),
  '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: ObjectId("647d6710ceea0aee9d870a3"),
  '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: ObjectId("647d6710ceea0aee9d870a4"),
  '身份': '學生',
  '系所': '生醫電資所',
  '年級': 1,
  '學號': 'R11945018',
  '姓名': '曾于瑋 (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: ObjectId("647d6710ceea0aee9d870a5"),
  '身份': '學生',
  '系所': '生醫電資所',
  '年級': 1,
  '學號': 'R11945044',
  '姓名': '張瑞健 (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 1-5

```

> db.students.find({'姓名':{$in:["小紅","小黃","小綠","郭庭沂 (KUO,TING-YI)"]}})
< {
  _id: ObjectId("647d6710ceea0aee9d870a3"),
  '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: ObjectId("647d7bd9ceea0aee9d870c0"),
  '身份': '旁聽生',
  '系所': '電機所',
  '年級': 2,
  '學號': 'R10123456',
  '姓名': '小紅',
  join_date: '2023/6/2'
}
{
  _id: ObjectId("647d7bd9ceea0aee9d870c1"),
  '身份': '學生',
  '系所': '物理系',
  '年級': 3,
  '學號': 'B09987653',
  '姓名': '小黃',
  join_date: '2023/6/2'
}
{
  _id: ObjectId("647d7bd9ceea0aee9d870c2"),
  '身份': '觀察者',
  '系所': '電信所',
  '年級': 1,
  '學號': 'R11123001',
  '姓名': '小綠',
  join_date: '2023/6/2'
}

```

Part 1-6

由於小黃、小紅、小綠是在 6/2 加入的，因此在 3/31 前的輸出結果會沒有這三人的資訊。
3/31 前電信所一年級為三個人，6/10 前則變為四個人。同理，物理系三年級和電機所二年級的學生人數一人皆在 6/10 前才有記錄到。

“2023-03-31”

```
db.students.aggregate([
  {
    $addFields: {
      join_date: {
        $dateFromString: {
          dateString: "$join_date"
        }
      }
    },
    {
      $match: {
        join_date: {
          $lte: ISODate("2023-03-31")
        }
      }
    },
    {
      $group: {
        _id: {
          年級: "$年級",
          系所: "$系所"
        },
        count: { $sum: 1 }
      }
    },
    {
      $out: "tally"
    }
  ])
db.tally.find({})
{
  "_id": {
    "年級": 2,
    "系所": "基壇所"
  },
  "count": 1
},
{
  "_id": {
    "年級": 1,
    "系所": "生醫電資所"
  },
  "count": 4
},
{
  "_id": {
    "年級": 3,
    "系所": "資管系"
  },
  "count": 1
},
{
  "_id": {
    "年級": 2,
    "系所": "電機系"
  },
  "count": 2
},
{
  "_id": {
    "年級": 4,
    "系所": "生物機電系"
  },
  "count": 1
},
{
  "_id": {
    "年級": 4,
    "系所": "機械系"
  },
  "count": 1
},
{
  "_id": {
    "年級": 3,
    "系所": "系統生物學程"
  },
  "count": 1
},
{
  "_id": {
    "年級": 2,
    "系所": "資工系"
  },
  "count": 5
},
{
  "_id": {
    "年級": 1,
    "系所": "資管系"
  },
  "count": 4
},
{
  "_id": {
    "年級": 4,
    "系所": "心理系"
  },
  "count": 2
},
{
  "_id": {
    "年級": 4,
    "系所": "生傳系"
  },
  "count": 1
},
{
  "_id": {
    "年級": 2,
    "系所": "電信所"
  },
  "count": 3
},
{
  "_id": {
    "年級": 1,
    "系所": "鋼鐵所"
  },
  "count": 1
},
{
  "_id": {
    "年級": 1,
    "系所": "資工系"
  },
  "count": 2
},
{
  "_id": {
    "年級": 2,
    "系所": "農經系"
  },
  "count": 1
},
{
  "_id": {
    "年級": 1,
    "系所": "生醫系"
  },
  "count": 1
},
{
  "_id": {
    "年級": 6,
    "系所": "電機系"
  },
  "count": 1
},
{
  "_id": {
    "年級": 1,
    "系所": "應數所"
  },
  "count": 1
},
{
  "_id": {
    "年級": 2,
    "系所": "土木系水利組"
  },
  "count": 1
},
{
  "_id": {
    "年級": 3,
    "系所": "工料海洋系"
  },
  "count": 1
},
{
  "_id": {
    "年級": 1,
    "系所": "國企系"
  },
  "count": 1
},
{
  "_id": {
    "年級": 2,
    "系所": "實管系"
  },
  "count": 3
},
{
  "_id": {
    "年級": 1,
    "系所": "土木系水利組"
  },
  "count": 2
},
{
  "_id": {
    "年級": 4,
    "系所": "實工系"
  },
  "count": 1
},
{
  "_id": {
    "年級": 1,
    "系所": "電機系"
  },
  "count": 16
},
{
  "_id": {
    "年級": 1,
    "系所": "資工系"
  },
  "count": 1
}
```

```
{
  "_id": {
    "年級": 3,
    "系所": "資工系"
  },
  "count": 6
},
{
  "_id": {
    "年級": 1,
    "系所": "資料科學碩士"
  },
  "count": 1
},
{
  "_id": {
    "年級": 2,
    "系所": "電機資安碩士"
  },
  "count": 1
},
{
  "_id": {
    "年級": 1,
    "系所": "土木系電機組"
  },
  "count": 3
},
{
  "_id": {
    "年級": 3,
    "系所": "電機系"
  },
  "count": 4
},
{
  "_id": {
    "年級": 2,
    "系所": "心理系一般組"
  },
  "count": 1
},
{
  "_id": {
    "年級": 4,
    "系所": "物理系"
  },
  "count": 2
},
{
  "_id": {
    "年級": 1,
    "系所": "統計碩士學程"
  },
  "count": 2
},
{
  "_id": {
    "年級": 3,
    "系所": "基壇所"
  },
  "count": 1
},
{
  "_id": {
    "年級": 2,
    "系所": "統計碩士學程"
  },
  "count": 2
},
{
  "_id": {
    "年級": 2,
    "系所": "光電所"
  },
  "count": 1
},
{
  "_id": {
    "年級": 1,
    "系所": "資料科學學程"
  },
  "count": 1
},
{
  "_id": {
    "年級": 3,
    "系所": "公衛系"
  },
  "count": 2
},
{
  "_id": {
    "年級": 2,
    "系所": "生醫系"
  },
  "count": 2
},
{
  "_id": {
    "年級": 1,
    "系所": "電信所"
  },
  "count": 3
},
{
  "_id": {
    "年級": 1,
    "系所": "機械系系統組"
  },
  "count": 1
},
{
  "_id": {
    "年級": 4,
    "系所": "醫工系"
  },
  "count": 1
},
{
  "_id": {
    "年級": 2,
    "系所": "資料科學學程"
  },
  "count": 2
},
{
  "_id": {
    "年級": 1,
    "系所": "電機系"
  },
  "count": 16
},
{
  "_id": {
    "年級": 2,
    "系所": "國企系"
  },
  "count": 1
},
{
  "_id": {
    "年級": 2,
    "系所": "實管系"
  },
  "count": 3
},
{
  "_id": {
    "年級": 1,
    "系所": "土木系水利組"
  },
  "count": 2
},
{
  "_id": {
    "年級": 4,
    "系所": "實工系"
  },
  "count": 1
}
```

“2023-06-10”

```

db.students.aggregate([
  {
    $addFields: {
      join_date: {
        $dateFromString: {
          dateString: "$join_date"
        }
      }
    }
  },
  {
    $match: {
      join_date: {
        $lte: ISODate("2023-06-10")
      }
    }
  },
  {
    $group: {
      _id: {
        年級: "$年級",
        系所: "$系所"
      },
      count: { $sum: 1 }
    }
  },
  {
    $out: "tally"
  }
])
db.tally.find({})

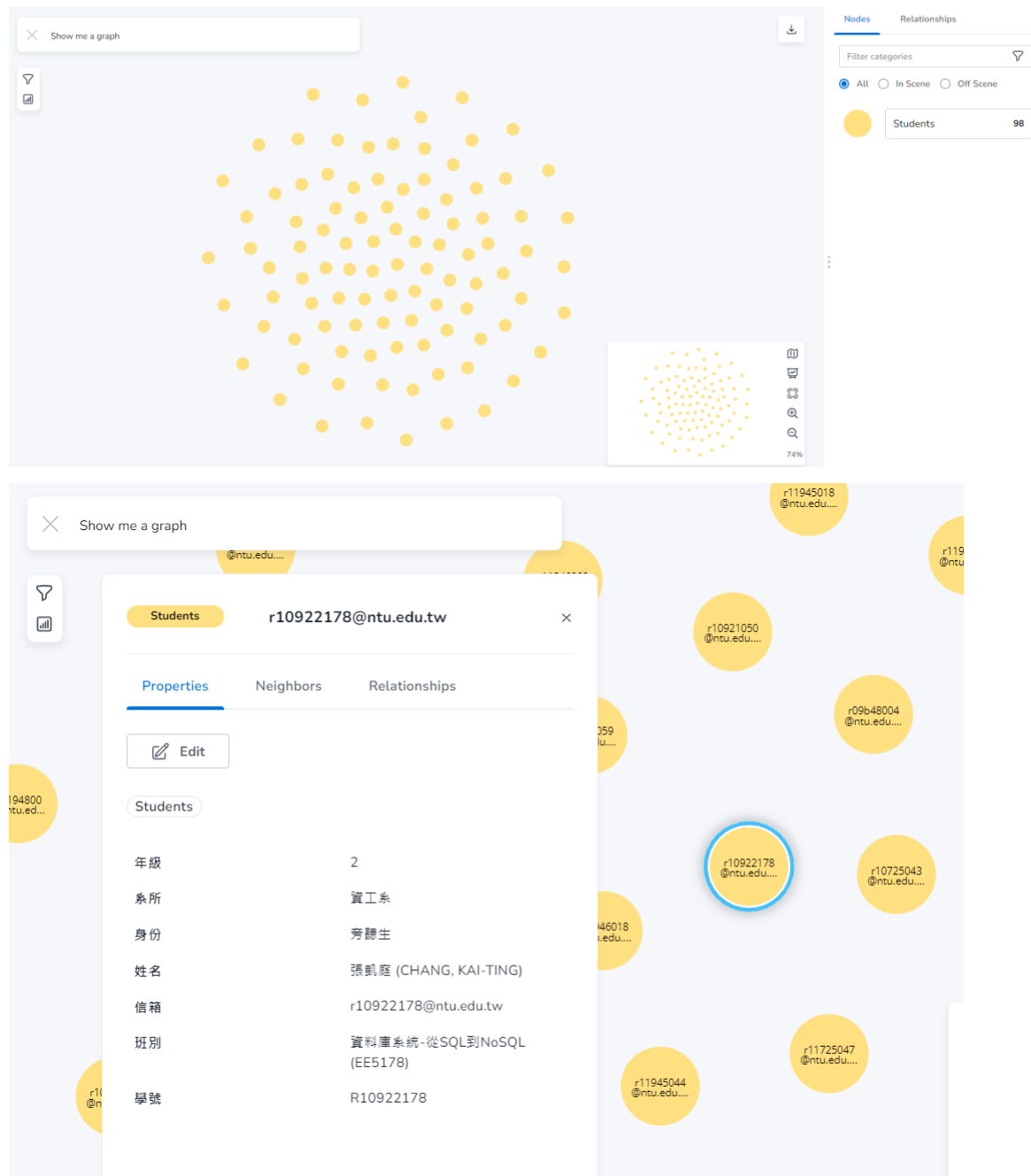
```

{ _id: { '年級': 2, '系所': '國企系' }, count: 1 }	{ _id: { '年級': 2, '系所': '資工系' }, count: 5 }	{ _id: { '年級': 1, '系所': '資管系' }, count: 4 }	{ _id: { '年級': 6, '系所': '電機系' }, count: 1 }
{ _id: { '年級': 3, '系所': '物理系' }, count: 1 }	{ _id: { '年級': 3, '系所': '系統生物學程' }, count: 1 }	{ _id: { '年級': 1, '系所': '網理所' }, count: 1 }	{ _id: { '年級': 1, '系所': '生機系' }, count: 1 }
{ _id: { '年級': 2, '系所': '電機系' }, count: 2 }	{ _id: { '年級': 4, '系所': '生物機電系' }, count: 1 }	{ _id: { '年級': 4, '系所': '生傳系' }, count: 1 }	{ _id: { '年級': 1, '系所': '應數所' }, count: 1 }
{ _id: { '年級': 3, '系所': '資管系' }, count: 1 }	{ _id: { '年級': 1, '系所': '資工系' }, count: 2 }	{ _id: { '年級': 2, '系所': '電信所' }, count: 3 }	{ _id: { '年級': 2, '系所': '農經系' }, count: 1 }
{ _id: { '年級': 4, '系所': '機械系' }, count: 1 }	{ _id: { '年級': 4, '系所': '心理系' }, count: 2 }	{ _id: { '年級': 2, '系所': '土木系水利組' }, count: 1 }	{ _id: { '年級': 3, '系所': '電機系' }, count: 4 }
			{ _id: { '年級': 3, '系所': '資工系' }, count: 6 }

{ _id: { '年級': 1, '系所': '資料科學博士' }, count: 1 }	{ _id: { '年級': 2, '系所': '光電所' }, count: 1 }	{ _id: { '年級': 2, '系所': '電機資訊碩班' }, count: 1 }	{ _id: { '年級': 2, '系所': '電機所' }, count: 1 }	{ _id: { '年級': 2, '系所': '資管系' }, count: 3 }
{ _id: { '年級': 2, '系所': '統計碩士學程' }, count: 2 }	{ _id: { '年級': 1, '系所': '資料科學學程' }, count: 1 }	{ _id: { '年級': 4, '系所': '醫工系' }, count: 1 }	{ _id: { '年級': 4, '系所': '經濟系' }, count: 4 }	{ _id: { '年級': 4, '系所': '資工系' }, count: 1 }
{ _id: { '年級': 3, '系所': '基衛所' }, count: 1 }	{ _id: { '年級': 4, '系所': '物理系' }, count: 2 }	{ _id: { '年級': 2, '系所': '資料科學學程' }, count: 2 }	{ _id: { '年級': 1, '系所': '電信所' }, count: 4 }	{ _id: { '年級': 2, '系所': '基衛所' }, count: 1 }
{ _id: { '年級': 3, '系所': '公衛系' }, count: 2 }	{ _id: { '年級': 1, '系所': '統計碩士學程' }, count: 2 }	{ _id: { '年級': 2, '系所': '生機系' }, count: 2 }	{ _id: { '年級': 1, '系所': '土木系水利組' }, count: 2 }	{ _id: { '年級': 1, '系所': '電機系' }, count: 16 }
				{ _id: { '年級': 1, '系所': '生醫電資所' }, count: 4 }
				{ _id: { '年級': 1, '系所': '機械系系控組' }, count: 1 }

Part 2-1

Use AuraDB to import csv

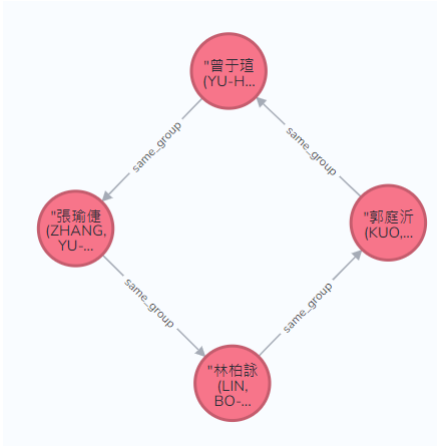


Part 2-2

```

1 MATCH (A:Students{學號:'R10945002'}), (B:Students{學號:'R11945005'}), (C:Students{學號:'R11945018'}), (D:Students{學號:'R11945044'})
2 CREATE (A)-[: same_group]→(B)-[: same_group]→(C)-[: same_group]→(D)-[: same_group]→(A)

```



Part 2-3

```

1 MATCH (student:Students{學號:'R10945002'})-[:same_group*]→(group)
2 RETURN collect([group.姓名])

```

collect(group.姓名)

["郭庭沂 (KUO,TING-YI)", "曾于瑄 (YU-HSUAN TSENG)", "張瑜僊 (ZHANG, YU-JIE)", "林柏詠 (LIN, BO-YONG)"]

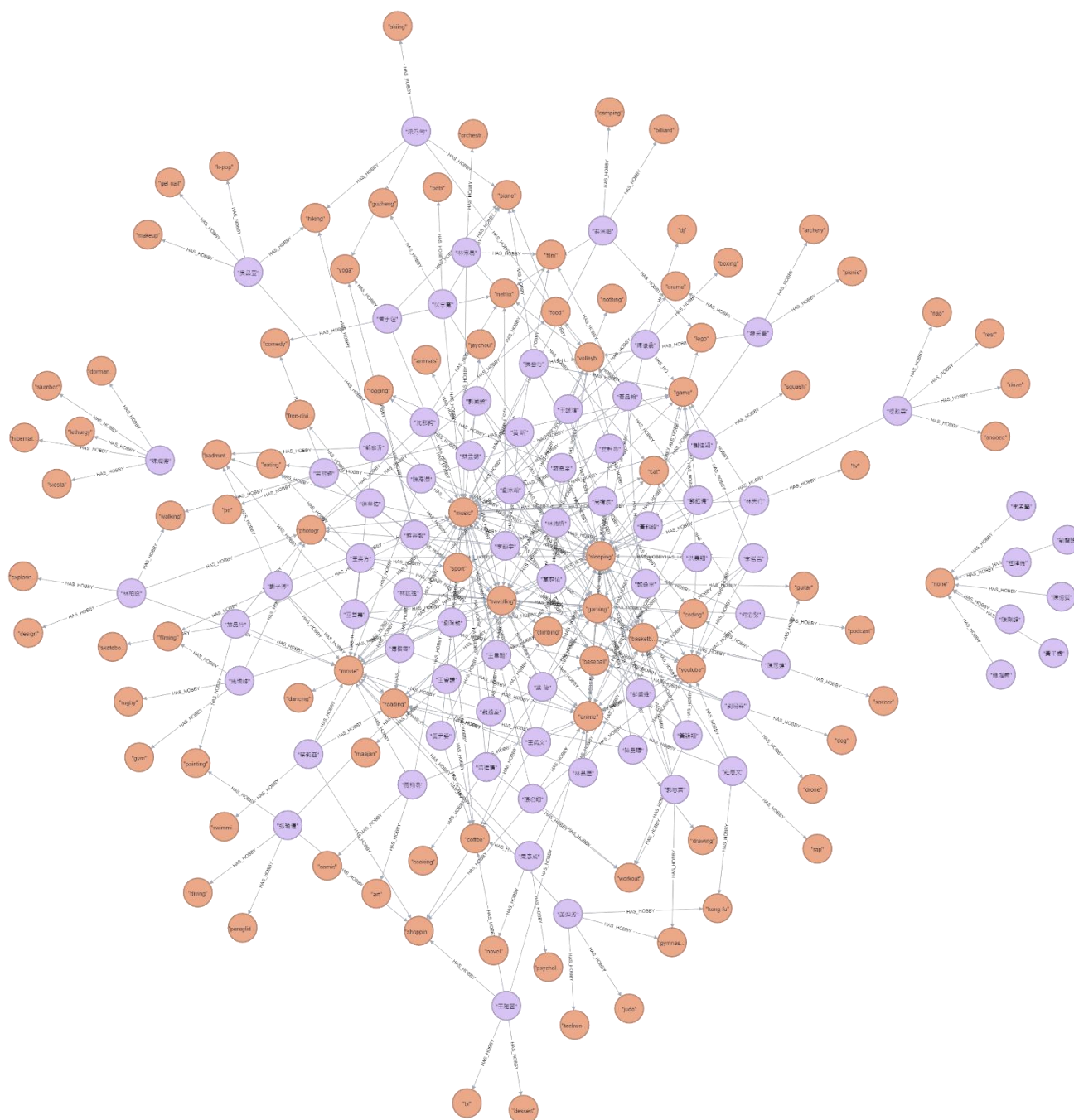
Part 3-1

將所有同學及興趣分別設成 node，並以“HAS_HOBBY”關聯起來。

```

1 LOAD CSV WITH HEADERS FROM 'https://docs.google.com/spreadsheets/d/e/2PACX-1vTf5gXkQyIrGhQEVcwpunB3mNpWHSV7Pm3TrykEhL2DtFYA-CqUf3y6LDw48zCBFQ_jHxmH-0ElgXbY/pub?gid=436205288&single=true&output=csv' AS row
2 MERGE (student:Student {學號: row.學號, 姓名: row.姓名})
3 WITH student, row
4 UNWIND [row.hobby1, row.hobby2, row.hobby3, row.hobby4, row.hobby5] AS hobby
5 MERGE (h: Hobby {name: hobby})
6 MERGE (student)-[:HAS_HOBBY]→(h)
7 MERGE p=()-[:HAS_HOBBY]→(:Hobby) RETURN p;

```



Part 3-2

1. 先取得自己的所有興趣，並找到和自己有同樣興趣的同學，以”Hobby_Friend”關聯起來。並將每位同學的興趣列出來(不包含共同興趣)，結果以 list 的方式呈現。

```

1 MATCH (me:Student {姓名: '郭庭沂'})-[:HAS_HOBBY]-(myHobby)
2 WITH me, COLLECT(DISTINCT myHobby) AS myHobbies
3
4 MATCH (me)-[:HAS_HOBBY]-(:Hobby)←[:HAS_HOBBY]-(friend:Student)-[:HAS_HOBBY]-(newHobby)
5 WHERE NOT newHobby IN myHobbies
6 MERGE (me)-[:HOBBY_Friend]-(friend)
7 RETURN friend.學號 AS 學號, friend.姓名 AS 姓名, COLLECT(DISTINCT newHobby.name) AS newHobbies

```

學號	姓名	newHobbies
"P11922003"	"梁乃勻"	["volleyball", "piano", "yoga", "skiing"]
"R11725058"	"吳品萱"	["makeup", "k-pop", "music", "gel-nail"]
"R11921018"	"徐華佑"	["free-diving", "climbing"]
"R10724039"	"黃 昕"	["film", "music", "gaming"]
"R11921093"	"林貽逸"	["coding", "gaming", "photography"]
"R11521613"	"林沛忻"	["volleyball", "game", "cat"]
"B09902021"	"黃科維"	["game", "lego", "baseball"]
"R11631028"	"劉易霖"	["climbing", "baseball", "drone", "dog"]
"B07202043"	"溫進揚"	["workout", "music", "gaming", "cooking"]
"R11945044"	"張瑜健"	["shopping", "diving", "painting", "paragliding"]
"R11945018"	"曾于瑄"	["yoga", "comedy", "piano", "netflix"]
"R11921008"	"羅恩至"	["climbing", "basketball", "jogging"]
"R11946012"	"王奕方"	["eating", "sport"]
"R11521603"	"陳冠鏞"	["guitar", "basketball", "soccer", "coding"]
"R11521616"	"何宏發"	["podcast", "youtube", "cat"]
"B10902065"	"黃品翰"	["music", "food", "film", "basketball"]
"B09902023"	"蔡孟鈞"	["jaychou", "basketball", "animals", "baseball"]
"R10946030"	"馬培峰"	["photography", "gym", "filming", "rugby"]
"R10455001"	"陳品瑄"	["reading", "drawing", "youtube"]
"B08B01073"	"魏逸豪"	["music", "climbing", "baseball"]
"D11948002"	"巫哲嘉"	["music", "baseball"]
"D06921008"	"黃尹姿"	["reading", "coffee", "music"]
"R10921050"	"王韋翰"	["anime", "gaming", "music"]
"R10H41016"	"翁 俊"	["gaming", "coffee", "music"]
"R11922134"	"許容繁"	["yoga", "youtube", "jogging", "reading"]
"R11921094"	"劉永翰"	["jogging", "gaming", "music", "baseball"]
"R11725047"	"林品歷"	["gaming", "basketball", "baseball"]
"R11921048"	"傅楷睿"	["reading", "anime", "dancing", "music"]
"B09901078"	"葉軒易"	["piano", "anime", "gaming", "music"]
"R11942083"	"伏宇寬"	["piano", "guzheng", "music", "pets"]

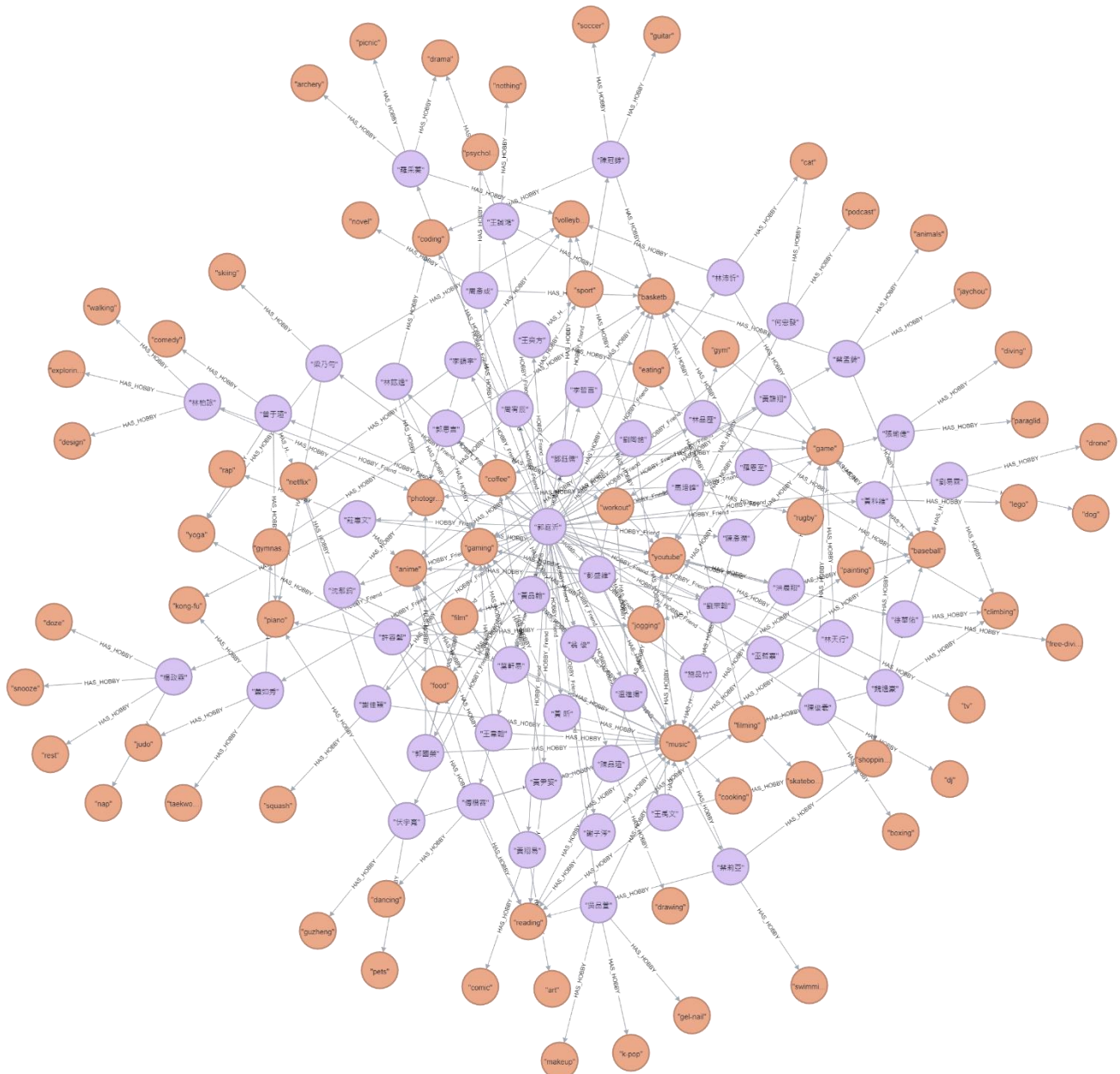
"R09525126"	"周宥辰"	["sport", "photography", "music", "coding"]
"B08902132"	"陳彥淵"	["music", "game", "eating"]
"R11921019"	"彭盛維"	["music", "gaming", "anime", "basketball"]
"R10725059"	"謝佳穎"	["squash", "gaming", "music", "netflix"]
"B08508002"	"郭思言"	["workout", "gymnastics", "basketball", "gaming"]
"B09705059"	"羅采菱"	["volleyball", "archery", "picnic", "drama"]
"R11921014"	"郭國榮"	["music", "gaming", "film", "photography"]
"B09902111"	"李哲言"	["youtube", "anime", "basketball", "game"]
"T11901205"	"陳俊義"	["boxing", "game", "music", "dj"]
"R11521305"	"黃詣翔"	["basketball", "baseball", "youtube", "workout"]
"R08424026"	"莊惠文"	["kong-fu", "anime", "rap", "youtube"]
"R10942155"	"洪晨翔"	["baseball", "game", "music", "youtube"]
"R11921013"	"王誠鴻"	["basketball", "nothing", "drama"]
"B09901133"	"林天行"	["youtube", "music", "game", "tv"]
"R10921069"	"沈郁鈞"	["photography", "netflix", "food", "music"]
"R11246002"	"王禹文"	["reading", "youtube", "shopping", "music"]
"R11725044"	"鄧鈺儒"	["music", "volleyball", "game", "anime"]
"R11521323"	"楊政霖"	["snooze", "nap", "rest", "doze"]
"R11921072"	"謝子彥"	["filming", "music", "reading"]
"R11921074"	"劉陶銘"	["music", "gaming", "volleyball", "coffee"]
"B08305037"	"周彥成"	["psychology", "coffee", "basketball", "novel"]
"R11921017"	"施品竹"	["painting", "photography", "skateboard", "music"]
"B08303047"	"黃翔易"	["art", "comic", "anime", "music"]
"R11921078"	"李鎮宇"	["photography", "youtube", "netflix", "volleyball"]
"R10945002"	"林柏詠"	["exploring", "design", "photography", "walking"]
"R11942195"	"蔡莉亞"	["reading", "music", "swimming", "shopping"]
"R09B48004"	"蕭如秀"	["taekwondo", "judo", "gymnastics", "kong-fu"]

2. 同 1，結果以 graph 呈現。

```

1 MATCH (me:Student {姓名: '郭庭沂'})-[:HAS_HOBBY]→(myHobby)
2 WITH me, COLLECT(DISTINCT myHobby) AS myHobbies
3
4 MATCH (me)-[:HAS_HOBBY]→(:Hobby)←[:HAS_HOBBY]-(friend:Student)-[:HAS_HOBBY]→(newHobby)
5 WHERE NOT newHobby IN myHobbies
6 MERGE (me)-[:HOBBY_Friend]→(friend)
7 MERGE p=()-[:HOBBY_Friend]→()-[:HAS_HOBBY]→(newHobby) RETURN p;
```





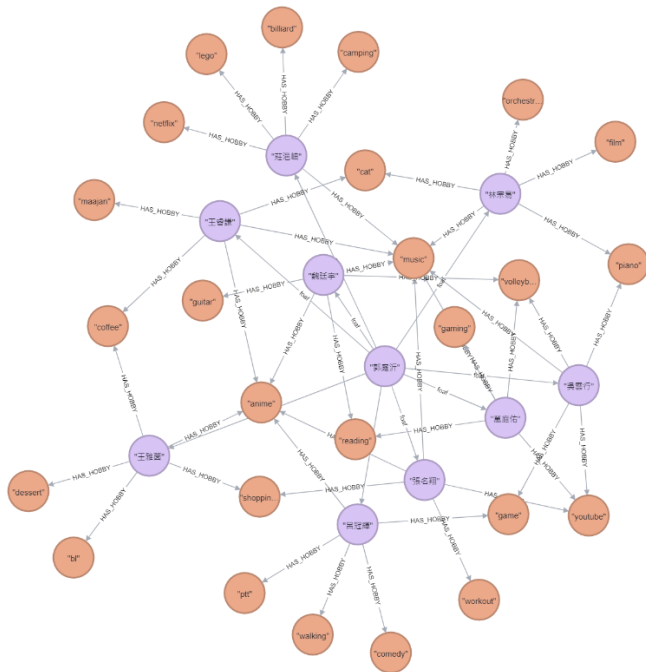
Part 3-3

先取得自己的所有興趣，並找出和上題朋友有共同興趣的同學，將他們和自己以"foaf"關聯起來，並取得他們的興趣(不包含和自己的共同興趣)，以 graph 呈現。

```

1 MATCH (me:Student {姓名: '郭庭沂'})-[:HAS_HOBBY]→(myHobby)
2 WITH me, COLLECT(DISTINCT myHobby) AS myHobbies
3
4 MATCH (me)-[:HOBBY_Friend]→(friend)-[:HAS_HOBBY]→(:Hobby)←[:HAS_HOBBY]-(foaf:Student)-
  [:HAS_HOBBY]→(newHobby: Hobby)
5 WHERE foaf <> me
6   AND NOT newHobby in myHobbies
7   AND NOT (foaf)←[:HOBBY_Friend]-(me)
8 MERGE (me)-[:foaf]→(foaf)
9
10 MERGE p=()-[:foaf]→()-[:HAS_HOBBY]→(newHobby) RETURN p;

```



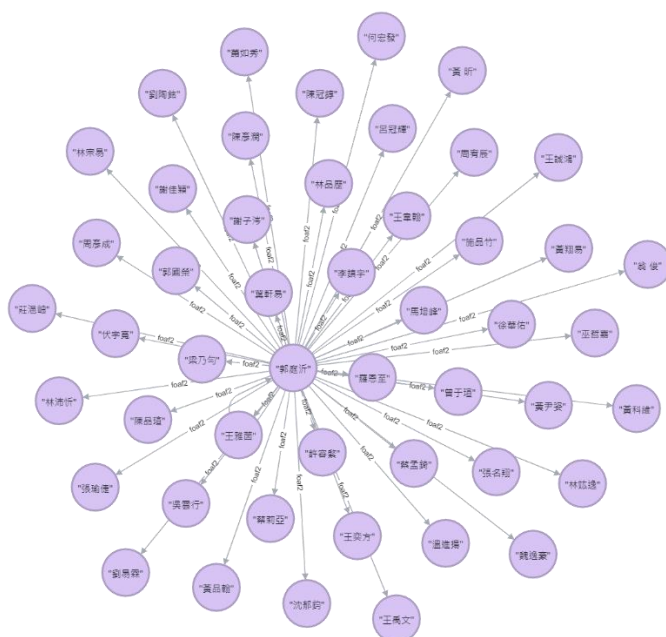
Part 3-4

先將同組的組員以"same_group"關聯起來，並找到和組員有共同興趣的同學，將這些同學以"foaf2"和自己關聯起來，最後以 graph 呈現所有的 foaf2，共 49 個。

```

1 MATCH (me:Student {姓名: '郭庭沂'}),(mem1:Student {學號: 'R10945002'}),(mem2:Student {學號: 'R11945018'}),(mem3:Student {學號: 'R11945044'})
2 MERGE (me)-[:same_group]→(mem1)
3 MERGE (me)-[:same_group]→(mem2)
4 MERGE (me)-[:same_group]→(mem3)
5 WITH me
6 MATCH (me)-[:same_group]→(member:Student)-[:HAS_HOBBY]→(:Hobby)←[:HAS_HOBBY]-(foaf2:Student)
7 MERGE (me)-[:foaf2]→(foaf2)
8
9 MERGE p=()-[:foaf2]→() RETURN p;

```



Part 3-5

找到和自己關聯的 foaf2，且同時不為 foaf 的同學，以 graph 呈現結果，共 43 個。

```
1 MATCH p=(me:Student {姓名: '郭庭沂'})-[:foaf2]→(A:Student)
2 WHERE NOT(A:Student)←[:foaf]- (me:Student {姓名: '郭庭沂'})
3 RETURN p;
```

