Part I (MongoDB)

Task1

```
(base) Jason@Home:~/Desktop$ mongoimport --db hw6 --collection students --drop --type csv --headerline --file /home/Jason/Downloads/hw6_student_data.csv
2021-06-16T01:47:21.780+0800    connected to: mongodb://localhost/
2021-06-16T01:47:21.780+0800    dropping: hw6.students
2021-06-16T01:47:21.788+0800    84 document(s) imported successfully. 0 document(s) failed to import.
(base) Jason@Home:~/Desktop$ mongo
MongoDB shell version v4.4.6
connecting to: mongodb://127.0.0.1:27017/?compressors=disabled&gssapiServiceName=mongodb
Implicit session: session { "id" : UUID("fba5cb24-1285-466e-a58a-ce29753c1a2d") }
MongoDB server version: 4.4.6
---
The server generated these startup warnings when booting:
        2021-06-16T05:24:33.004+08:00: Using the XFS filesystem is strongly recommended with the WiredTiger storage engine. See http://dochub.mongodb.org/core/prodnotes-filesystem
        2021-06-16T05:24:33.262+08:00: Access control is not enabled for the database. Read and write access to data and configuration is unrestricted
---
---
        Enable MongoDB's free cloud-based monitoring service, which will then receive and display
        metrics about your deployment (disk utilization, CPU, operation statistics, etc).

        The monitoring data will be available on a MongoDB website with a unique URL accessible to you
        and anyone you share the URL with. MongoDB may use this information to make product
        improvements and to suggest MongoDB products and deployment options to you.

        To enable free monitoring, run the following command: db.enableFreeMonitoring()
        To permanently disable this reminder, run the following command: db.disableFreeMonitoring()
---
> use hw6
switched to db hw6
> db.students.find({學號:"r09922146"})
{ "_id" : ObjectId("60c8e7a9b83a0c9c9bd41113"), "身份" : "校內生", "系所" : "資工系碩士班_一年級", "學號" : "r09922146", "姓名" : "簡辰哲" }
>
```

Task2

```
> db.students.find({$and: [{系所: "資工系碩士班_一年級"}, {學號: {$ne: "r09922146"}}]})
{ "_id" : ObjectId("60c8e7a9b83a0c9cbd41109"), "身份" : "校內生", "系所" : "資工系碩士班_一年級", "學號" : "r09922003", "姓名" : "吳政緯" }
{ "_id" : ObjectId("60c8e7a9b83a0c9cbd4110a"), "身份" : "校內生", "系所" : "資工系碩士班_一年級", "學號" : "r09922009", "姓名" : "林詩杏" }
{ "_id" : ObjectId("60c8e7a9b83a0c9cbd4110b"), "身份" : "校內生", "系所" : "資工系碩士班_一年級", "學號" : "r09922056", "姓名" : "王柏元" }
{ "_id" : ObjectId("60c8e7a9b83a0c9cbd4110c"), "身份" : "校內生", "系所" : "資工系碩士班_一年級", "學號" : "r09922063", "姓名" : "鄭鈞庭" }
{ "_id" : ObjectId("60c8e7a9b83a0c9cbd4110d"), "身份" : "校內生", "系所" : "資工系碩士班_一年級", "學號" : "r09922080", "姓名" : "魯尹均" }
{ "_id" : ObjectId("60c8e7a9b83a0c9cbd4110f"), "身份" : "校內生", "系所" : "資工系碩士班_一年級", "學號" : "r09922083", "姓名" : "阮明皓" }
{ "_id" : ObjectId("60c8e7a9b83a0c9cbd41110"), "身份" : "校內生", "系所" : "資工系碩士班_一年級", "學號" : "r09922090", "姓名" : "王文佐" }
{ "_id" : ObjectId("60c8e7a9b83a0c9cbd41111"), "身份" : "校內生", "系所" : "資工系碩士班_一年級", "學號" : "r09922095", "姓名" : "陳昕蝶" }
{ "_id" : ObjectId("60c8e7a9b83a0c9cbd41112"), "身份" : "校內生", "系所" : "資工系碩士班_一年級", "學號" : "r09922111", "姓名" : "張聖昌" }
{ "_id" : ObjectId("60c8e7a9b83a0c9cbd41114"), "身份" : "校內生", "系所" : "資工系碩士班_一年級", "學號" : "r09922116", "姓名" : "鐘青昌" }
{ "_id" : ObjectId("60c8e7a9b83a0c9cbd41115"), "身份" : "校內生", "系所" : "資工系碩士班_一年級", "學號" : "r09922155", "姓名" : "印聖約" }
{ "_id" : ObjectId("60c8e7a9b83a0c9cbd41116"), "身份" : "校內生", "系所" : "資工系碩士班_一年級", "學號" : "r09922156", "姓名" : "簡丞甄" }
{ "_id" : ObjectId("60c8e7a9b83a0c9cbd41117"), "身份" : "校內生", "系所" : "資工系碩士班_一年級", "學號" : "r09922167", "姓名" : "林琮珉" }
```

Task3

```
> db.students.aggregate([{$group:{_id:{系所: "$系所"}, number:{$sum:1}}}])
{ "_id" : { "系所" : "機械系熱學組碩士班_二年級" }, "number" : 1 }
{ "_id" : { "系所" : "機械系_四年級" }, "number" : 1 }
{ "_id" : { "系所" : "網媒所碩士班_一年級" }, "number" : 1 }
{ "_id" : { "系所" : "環職所碩士班_二年級" }, "number" : 1 }
{ "_id" : { "系所" : "生機系碩士班_一年級" }, "number" : 1 }
{ "_id" : { "系所" : "資工系碩士班_一年級" }, "number" : 14 }
{ "_id" : { "系所" : "資工系碩士班_三年級" }, "number" : 1 }
{ "_id" : { "系所" : "財金系_一年級" }, "number" : 1 }
{ "_id" : { "系所" : "地理系碩士班_三年級" }, "number" : 1 }
{ "_id" : { "系所" : "資料科學博士博士班_一年級" }, "number" : 1 }
{ "_id" : { "系所" : "電機資安碩班碩士班_二年級" }, "number" : 1 }
{ "_id" : { "系所" : "網媒所碩士班_二年級" }, "number" : 1 }
{ "_id" : { "系所" : "電信所碩士班_二年級" }, "number" : 3 }
{ "_id" : { "系所" : "電機系碩士班_一年級" }, "number" : 10 }
{ "_id" : { "系所" : "生機系碩士班_二年級" }, "number" : 1 }
{ "_id" : { "系所" : "電子所碩士班_四年級" }, "number" : 1 }
{ "_id" : { "系所" : "工科海洋系_三年級" }, "number" : 1 }
{ "_id" : { "系所" : "電機系碩士班_二年級" }, "number" : 2 }
{ "_id" : { "系所" : "資料科學學程碩士班_一年級" }, "number" : 2 }
{ "_id" : { "系所" : "材料系_四年級" }, "number" : 2 }
Type "it" for more
> it
{ "_id" : { "系所" : "經濟系碩士班_二年級" }, "number" : 1 }
{ "_id" : { "系所" : "資工系_三年級" }, "number" : 8 }
{ "_id" : { "系所" : "電機系_一年級" }, "number" : 1 }
{ "_id" : { "系所" : "生技系_一年級" }, "number" : 1 }
{ "_id" : { "系所" : "電信所碩士班_一年級" }, "number" : 5 }
{ "_id" : { "系所" : "生醫電資所碩士班_二年級" }, "number" : 1 }
{ "_id" : { "系所" : "工科海洋系碩士班_一年級" }, "number" : 3 }
{ "_id" : { "系所" : "資管系_四年級" }, "number" : 1 }
{ "_id" : { "系所" : "資工系碩士班_二年級" }, "number" : 2 }
{ "_id" : { "系所" : "國企系_四年級" }, "number" : 1 }
{ "_id" : { "系所" : "電機系_四年級" }, "number" : 4 }
{ "_id" : { "系所" : "電機系_三年級" }, "number" : 2 }
{ "_id" : { "系所" : "資工系_四年級" }, "number" : 7 }
>
```

Task4

db.students.updateMany({}, {$set:{日期: new Date("2021-03-01")}})
{
  "acknowledged" : true,
  "matchedCount" : 84,
  "modifiedCount" : 84
}
db.students.find({學號: "r09922146"})
{ "_id" : ObjectId("60c8e7a9b83a0c9c9bd41113"), "身份" : "校內生", "系所" : "資工系碩士班一年級", "學號" : "r09922146", "姓名" : "簡辰哲", "日期" : ISODate("2021-03-01T00:00:00Z") }
db.students.find({系所:{$and:[{系所: "資工系碩士班一年級"},{學號:{$ne:"r09922146"}}]})
{ "_id" : ObjectId("60c8e7a9b83a0c9c9bd41109"), "身份" : "校內生", "系所" : "資工系碩士班一年級", "學號" : "r09922003", "姓名" : "吳政樺", "日期" : ISODate("2021-03-01T00:00:00Z") }
{ "_id" : ObjectId("60c8e7a9b83a0c9c9bd4110a"), "身份" : "校內生", "系所" : "資工系碩士班一年級", "學號" : "r09922009", "姓名" : "林詩菱", "日期" : ISODate("2021-03-01T00:00:00Z") }
{ "_id" : ObjectId("60c8e7a9b83a0c9c9bd4110b"), "身份" : "校內生", "系所" : "資工系碩士班一年級", "學號" : "r09922056", "姓名" : "王柏元", "日期" : ISODate("2021-03-01T00:00:00Z") }
{ "_id" : ObjectId("60c8e7a9b83a0c9c9bd4110c"), "身份" : "校內生", "系所" : "資工系碩士班一年級", "學號" : "r09922063", "姓名" : "鄭喬庭", "日期" : ISODate("2021-03-01T00:00:00Z") }
{ "_id" : ObjectId("60c8e7a9b83a0c9c9bd4110d"), "身份" : "校內生", "系所" : "資工系碩士班一年級", "學號" : "r09922080", "姓名" : "曾尹均", "日期" : ISODate("2021-03-01T00:00:00Z") }
{ "_id" : ObjectId("60c8e7a9b83a0c9c9bd4110e"), "身份" : "校內生", "系所" : "資工系碩士班一年級", "學號" : "r09922083", "姓名" : "阮明培", "日期" : ISODate("2021-03-01T00:00:00Z") }
{ "_id" : ObjectId("60c8e7a9b83a0c9c9bd4110f"), "身份" : "校內生", "系所" : "資工系碩士班一年級", "學號" : "r09922090", "姓名" : "王文豪", "日期" : ISODate("2021-03-01T00:00:00Z") }
{ "_id" : ObjectId("60c8e7a9b83a0c9c9bd41110"), "身份" : "校內生", "系所" : "資工系碩士班一年級", "學號" : "r09922095", "姓名" : "陳昕瑋", "日期" : ISODate("2021-03-01T00:00:00Z") }
{ "_id" : ObjectId("60c8e7a9b83a0c9c9bd41111"), "身份" : "校內生", "系所" : "資工系碩士班一年級", "學號" : "r09922109", "姓名" : "鍾青昌", "日期" : ISODate("2021-03-01T00:00:00Z") }
{ "_id" : ObjectId("60c8e7a9b83a0c9c9bd41112"), "身份" : "校內生", "系所" : "資工系碩士班一年級", "學號" : "r09922111", "姓名" : "邱聖凱", "日期" : ISODate("2021-03-01T00:00:00Z") }
{ "_id" : ObjectId("60c8e7a9b83a0c9c9bd41114"), "身份" : "校內生", "系所" : "資工系碩士班一年級", "學號" : "r09922116", "姓名" : "廖彥欽", "日期" : ISODate("2021-03-01T00:00:00Z") }
{ "_id" : ObjectId("60c8e7a9b83a0c9c9bd41115"), "身份" : "校內生", "系所" : "資工系碩士班一年級", "學號" : "r09922155", "姓名" : "高泳甄", "日期" : ISODate("2021-03-01T00:00:00Z") }
{ "_id" : ObjectId("60c8e7a9b83a0c9c9bd41116"), "身份" : "校內生", "系所" : "資工系碩士班一年級", "學號" : "r09922156", "姓名" : "李昭妤", "日期" : ISODate("2021-03-01T00:00:00Z") }
{ "_id" : ObjectId("60c8e7a9b83a0c9c9bd41117"), "身份" : "校內生", "系所" : "資工系碩士班一年級", "學號" : "r09922167", "姓名" : "林琇珉", "日期" : ISODate("2021-03-01T00:00:00Z") }

Task5

```
> db.students.insert([
...{
...身份:"旁聽生",
...系所:"歷史系_一年級",
...學號:"b09900201",
...姓名:"小花",
...日期:new Date("2021-06-02")
...},
...{
...身份:"校內生",
...系所:"歷史系_四年級",
...學號:"b06900332",
...姓名:"小璽",
...日期:new Date("2021-06-02")
...},
...{
...身份:"校內生",
...系所:"機械系_四年級",
...學號:"b06502055",
...姓名:"小天",
...日期:new Date("2021-06-02")
...}
...]);
BulkWriteResult({
...	"writeErrors" : [ ],
...	"writeConcernErrors" : [ ],
...	"nInserted" : 3,
...	"nUpserted" : 0,
...	"nMatched" : 0,
...	"nModified" : 0,
...	"nRemoved" : 0,
...	"upserted" : [ ]
...})
> db.students.find(
...{
...$or:[
...	{學號:"r09922146"},
...	{學號:"b09900201"},
...	{學號:"b06900332"},
...	{學號:"b06502055"},
...	]
...}
...)
{ "_id" : ObjectId("60c8e7a9b83a0c9bd41113"), "身份" : "資工系碩士班_一年級", "學號" : "r09922146", "姓名" : "簡辰哲", "日期" : ISODate("2021-03-01T00:00:00Z") }
{ "_id" : ObjectId("60c8e29a406fd9a17a13118d"), "身份" : "旁聽生", "系所" : "歷史系_一年級", "學號" : "b09900201", "姓名" : "小花", "日期" : ISODate("2021-06-02T00:00:00Z") }
{ "_id" : ObjectId("60c8e29a406fd9a17a13118e"), "身份" : "校內生", "系所" : "歷史系_四年級", "學號" : "b06900332", "姓名" : "小璽", "日期" : ISODate("2021-06-02T00:00:00Z") }
{ "_id" : ObjectId("60c8e29a406fd9a17a13118f"), "身份" : "校內生", "系所" : "機械系_四年級", "學號" : "b06502055", "姓名" : "小天", "日期" : ISODate("2021-06-02T00:00:00Z") }
```

Task 6

myupdate(new Date("2021-03-31"))

{ "_id" : { "系所" : "財金系_一年級" }, "tally" : 1 }
{ "_id" : { "系所" : "資工系_三年級" }, "tally" : 8 }
{ "_id" : { "系所" : "地理系碩士班_三年級" }, "tally" : 1 }
{ "_id" : { "系所" : "資管系_四年級" }, "tally" : 1 }
{ "_id" : { "系所" : "電信所碩士班_一年級" }, "tally" : 5 }
{ "_id" : { "系所" : "生技系_一年級" }, "tally" : 1 }
{ "_id" : { "系所" : "工科海洋系_三年級" }, "tally" : 1 }
{ "_id" : { "系所" : "資料科學學程碩士班_一年級" }, "tally" : 2 }
{ "_id" : { "系所" : "生機系碩士班_二年級" }, "tally" : 1 }
{ "_id" : { "系所" : "材料系_四年級" }, "tally" : 2 }
{ "_id" : { "系所" : "資工系碩士班_二年級" }, "tally" : 2 }
{ "_id" : { "系所" : "工科海洋系碩士班_一年級" }, "tally" : 3 }
{ "_id" : { "系所" : "資工系_四年級" }, "tally" : 7 }
Type "it" for more
> it
{ "_id" : { "系所" : "經濟系碩士班_二年級" }, "tally" : 1 }
{ "_id" : { "系所" : "電機系碩士班_二年級" }, "tally" : 2 }
{ "_id" : { "系所" : "電機系_三年級" }, "tally" : 2 }
{ "_id" : { "系所" : "電機系_四年級" }, "tally" : 4 }
{ "_id" : { "系所" : "生醫電資所碩士班_二年級" }, "tally" : 1 }
{ "_id" : { "系所" : "生機系碩士班_一年級" }, "tally" : 1 }
{ "_id" : { "系所" : "電機資安碩班碩士班_二年級" }, "tally" : 1 }
{ "_id" : { "系所" : "資工系碩士班_三年級" }, "tally" : 1 }
{ "_id" : { "系所" : "電機系碩士班_一年級" }, "tally" : 10 }
{ "_id" : { "系所" : "網媒所碩士班_一年級" }, "tally" : 1 }
{ "_id" : { "系所" : "機械系_四年級" }, "tally" : 1 }
{ "_id" : { "系所" : "國企系_四年級" }, "tally" : 1 }
{ "_id" : { "系所" : "環職所碩士班_二年級" }, "tally" : 1 }
{ "_id" : { "系所" : "網媒所碩士班_二年級" }, "tally" : 1 }
{ "_id" : { "系所" : "機械系熱學組碩士班_二年級" }, "tally" : 1 }
{ "_id" : { "系所" : "電信所碩士班_二年級" }, "tally" : 3 }
{ "_id" : { "系所" : "電子所碩士班_四年級" }, "tally" : 1 }
{ "_id" : { "系所" : "電機系_一年級" }, "tally" : 1 }
{ "_id" : { "系所" : "資工系碩士班_一年級" }, "tally" : 14 }
{ "_id" : { "系所" : "資料科學博士博士班_一年級" }, "tally" : 1 }
> it
no cursor
>

myupdate(new Date("2021-06-10"))

```
{ "_id" : { "系所" : "財金系_一年級" }, "tally" : 1 }
{ "_id" : { "系所" : "資工系_三年級" }, "tally" : 8 }
{ "_id" : { "系所" : "地理系碩士班_三年級" }, "tally" : 1 }
{ "_id" : { "系所" : "資管系_四年級" }, "tally" : 1 }
{ "_id" : { "系所" : "電信所碩士班_一年級" }, "tally" : 5 }
{ "_id" : { "系所" : "生技系_一年級" }, "tally" : 1 }
{ "_id" : { "系所" : "工科海洋系_三年級" }, "tally" : 1 }
{ "_id" : { "系所" : "資料科學學程碩士班_一年級" }, "tally" : 2 }
{ "_id" : { "系所" : "生機系碩士班_二年級" }, "tally" : 1 }
{ "_id" : { "系所" : "材料系_四年級" }, "tally" : 2 }
{ "_id" : { "系所" : "資工系碩士班_二年級" }, "tally" : 2 }
{ "_id" : { "系所" : "工科海洋系碩士班_一年級" }, "tally" : 3 }
{ "_id" : { "系所" : "資工系_四年級" }, "tally" : 7 }
Type "it" for more
> it
{ "_id" : { "系所" : "經濟系碩士班_二年級" }, "tally" : 1 }
{ "_id" : { "系所" : "電機系碩士班_二年級" }, "tally" : 2 }
{ "_id" : { "系所" : "電機系_三年級" }, "tally" : 2 }
{ "_id" : { "系所" : "電機系_四年級" }, "tally" : 4 }
{ "_id" : { "系所" : "生醫電資所碩士班_二年級" }, "tally" : 1 }
{ "_id" : { "系所" : "生機系碩士班_一年級" }, "tally" : 1 }
{ "_id" : { "系所" : "電機資安碩班碩士班_二年級" }, "tally" : 1 }
{ "_id" : { "系所" : "資工系碩士班_三年級" }, "tally" : 1 }
{ "_id" : { "系所" : "電機系碩士班_一年級" }, "tally" : 10 }
{ "_id" : { "系所" : "網媒所碩士班_一年級" }, "tally" : 1 }
{ "_id" : { "系所" : "機械系_四年級" }, "tally" : 2 }
{ "_id" : { "系所" : "國企系_四年級" }, "tally" : 1 }
{ "_id" : { "系所" : "環職所碩士班_二年級" }, "tally" : 1 }
{ "_id" : { "系所" : "網媒所碩士班_二年級" }, "tally" : 1 }
{ "_id" : { "系所" : "機械系熱學組碩士班_二年級" }, "tally" : 1 }
{ "_id" : { "系所" : "電信所碩士班_二年級" }, "tally" : 3 }
{ "_id" : { "系所" : "電子所碩士班_四年級" }, "tally" : 1 }
{ "_id" : { "系所" : "電機系_一年級" }, "tally" : 1 }
{ "_id" : { "系所" : "資工系碩士班_一年級" }, "tally" : 14 }
{ "_id" : { "系所" : "資料科學博士博士班_一年級" }, "tally" : 1 }
Type "it" for more
> it
{ "_id" : { "系所" : "歷史系_一年級" }, "tally" : 1 }
{ "_id" : { "系所" : "歷史系_四年級" }, "tally" : 1 }
>
```

Part II (Graph DB Basic)

Task 1

```
neo4j@neo4j> LOAD CSV WITH HEADERS FROM "file:///hw6_student_data.csv"
             AS line FIELDTERMINATOR ',' CREATE (p:Student { 身份: line.身份, 系所: line.系所, 學號: line.學號, 姓名: line.姓名})
             RETURN p;
+-------------------------------------------------------------------------------------+
| p                                                                                   |
+-------------------------------------------------------------------------------------+
| (:Student {姓名: "林祐寬", 系所: "材料系_四年級 ", 身份: "校內生 ", 學號: "b04507017"})        |
| (:Student {姓名: "徐鈺泓", 系所: "機械系_四年級 ", 身份: "校內生 ", 學號: "b05502172"})        |
| (:Student {姓名: "林容與", 系所: "工科海洋系_三年級 ", 身份: "校內生 ", 學號: "b05505006"})      |
| (:Student {姓名: "戴若竹", 系所: "材料系_四年級 ", 身份: "校內生 ", 學號: "b06507019"})        |
| (:Student {姓名: "廖偉丞", 系所: "國企系_四年級 ", 身份: "校內生 ", 學號: "b06704094"})        |
| (:Student {姓名: "馮正安", 系所: "資管系_四年級 ", 身份: "校內生 ", 學號: "b06705056"})        |
| (:Student {姓名: "陳奐廷", 系所: "電機系_四年級 ", 身份: "校內生 ", 學號: "b06901023"})        |
| (:Student {姓名: "葉曜德", 系所: "電機系_四年級 ", 身份: "校內生 ", 學號: "b06901046"})        |
| (:Student {姓名: "陳宇軒", 系所: "電機系_四年級 ", 身份: "校內生 ", 學號: "b06901103"})        |
| (:Student {姓名: "郭芝均", 系所: "電機系_四年級 ", 身份: "校內生 ", 學號: "b06901164"})        |
| (:Student {姓名: "陳義榮", 系所: "資工系_四年級 ", 身份: "校內生 ", 學號: "b06902001"})        |
| (:Student {姓名: "黃紹輔", 系所: "資工系_四年級 ", 身份: "校內生 ", 學號: "b06902013"})        |
| (:Student {姓名: "洪佳生", 系所: "資工系_四年級 ", 身份: "校內生 ", 學號: "b06902019"})        |
| (:Student {姓名: "唐 浩", 系所: "資工系_四年級 ", 身份: "校內生 ", 學號: "b06902020"})        |
| (:Student {姓名: "張道然", 系所: "資工系_四年級 ", 身份: "校內生 ", 學號: "b06902045"})        |
| (:Student {姓名: "李 謙", 系所: "資工系_四年級 ", 身份: "校內生 ", 學號: "b06902072"})        |
| (:Student {姓名: "袁其崧", 系所: "資工系_四年級 ", 身份: "校內生 ", 學號: "b06902077"})        |
| (:Student {姓名: "沈信樺", 系所: "電機系_三年級 ", 身份: "校內生 ", 學號: "b07901043"})        |
| (:Student {姓名: "陳映樵", 系所: "電機系_三年級 ", 身份: "校內生 ", 學號: "b07901184"})        |
| (:Student {姓名: "林則仰", 系所: "資工系_三年級 ", 身份: "校內生 ", 學號: "b07902006"})        |
| (:Student {姓名: "蔡承濬", 系所: "資工系_三年級 ", 身份: "校內生 ", 學號: "b07902014"})        |
| (:Student {姓名: "江律旻", 系所: "資工系_三年級 ", 身份: "校內生 ", 學號: "b07902015"})        |
| (:Student {姓名: "張鈞堯", 系所: "資工系_三年級 ", 身份: "校內生 ", 學號: "b07902022"})        |
| (:Student {姓名: "高偉倫", 系所: "資工系_三年級 ", 身份: "校內生 ", 學號: "b07902027"})        |
| (:Student {姓名: "李宥霆", 系所: "資工系_三年級 ", 身份: "校內生 ", 學號: "b07902048"})        |
| (:Student {姓名: "許浩鳴", 系所: "資工系_三年級 ", 身份: "校內生 ", 學號: "b07902053"})        |
| (:Student {姓名: "鄭世朋", 系所: "資工系_三年級 ", 身份: "校內生 ", 學號: "b07902124"})        |
| (:Student {姓名: "江妙真", 系所: "資料科學博士博士班_一年級 ", 身份: "校內生 ", 學號: "d09948004"}) |
| (:Student {姓名: "譚雋飛", 系所: "電子所碩士班_四年級 ", 身份: "校內生 ", 學號: "r05943167"})     |
| (:Student {姓名: "杜承軒", 系所: "地理系碩士班_三年級 ", 身份: "校內生 ", 學號: "r07228005"})     |
| (:Student {姓名: "黃宇丞", 系所: "環職所碩士班_二年級 ", 身份: "校內生 ", 學號: "r07844012"})     |
| (:Student {姓名: "王立友", 系所: "經濟系碩士班_三年級 ", 身份: "校內生 ", 學號: "r07922178"})     |
| (:Student {姓名: "林祐辰", 系所: "經濟系碩士班_二年級 ", 身份: "校內生 ", 學號: "r08323046"})     |
| (:Student {姓名: "劉丁豪", 系所: "機械系熱學組碩士班_二年級 ", 身份: "校內生 ", 學號: "r08522313"}) |
| (:Student {姓名: "許述文", 系所: "生機系碩士班_二年級 ", 身份: "校內生 ", 學號: "r08631006"})     |
| (:Student {姓名: "白曜瑋", 系所: "電機系碩士班_二年級 ", 身份: "校內生 ", 學號: "r08921050"})     |
| (:Student {姓名: "羅浩倫", 系所: "電機系碩士班_二年級 ", 身份: "校內生 ", 學號: "r08921051"})     |
| (:Student {姓名: "洪瑞隆", 系所: "電機資安碩班碩士班_二年級 ", 身份: "校內生 ", 學號: "r08921a02"}) |
| (:Student {姓名: "王 甯", 系所: "資工系碩士班_二年級 ", 身份: "校內生 ", 學號: "r08922099"})     |
| (:Student {姓名: "王俞禮", 系所: "資工系碩士班_二年級 ", 身份: "校內生 ", 學號: "r08922181"})     |
| (:Student {姓名: "鄭元嘉", 系所: "電信所碩士班_二年級 ", 身份: "校內生 ", 學號: "r08942154"})     |
| (:Student {姓名: "翁孅婷", 系所: "電信所碩士班_二年級 ", 身份: "校內生 ", 學號: "r08942155"})     |
| (:Student {姓名: "徐子崴", 系所: "電信所碩士班_二年級 ", 身份: "校內生 ", 學號: "r08942160"})     |
| (:Student {姓名: "白語彤", 系所: "網媒所碩士班_二年級 ", 身份: "校內生 ", 學號: "r08944012"})     |
| (:Student {姓名: "曾显衡", 系所: "生醫電資所碩士班_二年級 ", 身份: "校內生 ", 學號: "r08945056"})   |
| (:Student {姓名: "張泳絜", 系所: "工科海洋系碩士班_一年級 ", 身份: "校內生 ", 學號: "r09525060"})   |
| (:Student {姓名: "廖晨閔", 系所: "工科海洋系碩士班_一年級 ", 身份: "校內生 ", 學號: "r09525068"})   |
| (:Student {姓名: "陳 顥", 系所: "工科海洋系碩士班_一年級 ", 身份: "校內生 ", 學號: "r09525109"})   |
| (:Student {姓名: "薛孟謙", 系所: "生機系碩士班_一年級 ", 身份: "校內生 ", 學號: "r09631012"})     |
| (:Student {姓名: "葉沛鎧", 系所: "電機系碩士班_一年級 ", 身份: "校內生 ", 學號: "r09921036"})     |
| (:Student {姓名: "林奕昀", 系所: "電機系碩士班_一年級 ", 身份: "校內生 ", 學號: "r09921051"})     |
| (:Student {姓名: "丁 維", 系所: "電機系碩士班_一年級 ", 身份: "校內生 ", 學號: "r09921064"})     |
| (:Student {姓名: "黃賀伶", 系所: "電機系碩士班_一年級 ", 身份: "校內生 ", 學號: "r09921089"})     |
| (:Student {姓名: "吳林宣", 系所: "電機系碩士班_一年級 ", 身份: "校內生 ", 學號: "r09921091"})     |
| (:Student {姓名: "黃靖中", 系所: "電機系碩士班_一年級 ", 身份: "校內生 ", 學號: "r09921092"})     |
| (:Student {姓名: "張景翰", 系所: "電機系碩士班_一年級 ", 身份: "校內生 ", 學號: "r09921095"})     |
| (:Student {姓名: "廖耕新", 系所: "電機系碩士班_一年級 ", 身份: "校內生 ", 學號: "r09921096"})     |
| (:Student {姓名: "楊智凱", 系所: "電機系碩士班_一年級 ", 身份: "校內生 ", 學號: "r09921104"})     |
| (:Student {姓名: "何政剛", 系所: "電機系碩士班_一年級 ", 身份: "校內生 ", 學號: "r09921107"})     |
| (:Student {姓名: "吳政緯", 系所: "資工系碩士班_一年級 ", 身份: "校內生 ", 學號: "r09922003"})     |
| (:Student {姓名: "林詩芩", 系所: "資工系碩士班_一年級 ", 身份: "校內生 ", 學號: "r09922009"})     |
| (:Student {姓名: "王柏元", 系所: "資工系碩士班_一年級 ", 身份: "校內生 ", 學號: "r09922056"})     |
| (:Student {姓名: "鄭筠庭", 系所: "資工系碩士班_一年級 ", 身份: "校內生 ", 學號: "r09922063"})     |
| (:Student {姓名: "曾尹均", 系所: "資工系碩士班_一年級 ", 身份: "校內生 ", 學號: "r09922080"})     |
| (:Student {姓名: "阮明皓", 系所: "資工系碩士班_一年級 ", 身份: "校內生 ", 學號: "r09922083"})     |
| (:Student {姓名: "王文依", 系所: "資工系碩士班_一年級 ", 身份: "校內生 ", 學號: "r09922090"})     |
| (:Student {姓名: "陳昕璘", 系所: "資工系碩士班_一年級 ", 身份: "校內生 ", 學號: "r09922095"})     |
| (:Student {姓名: "鍾育昌", 系所: "資工系碩士班_一年級 ", 身份: "校內生 ", 學號: "r09922111"})     |
| (:Student {姓名: "邱聖約", 系所: "資工系碩士班_一年級 ", 身份: "校內生 ", 學號: "r09922116"})     |
| (:Student {姓名: "簡辰哲", 系所: "資工系碩士班_一年級 ", 身份: "校內生 ", 學號: "r09922146"})     |
| (:Student {姓名: "簡丞珮", 系所: "資工系碩士班_一年級 ", 身份: "校內生 ", 學號: "r09922155"})     |
| (:Student {姓名: "李昭妤", 系所: "資工系碩士班_一年級 ", 身份: "校內生 ", 學號: "r09922156"})     |
| (:Student {姓名: "林琮珉", 系所: "資工系碩士班_一年級 ", 身份: "校內生 ", 學號: "r09922167"})     |
| (:Student {姓名: "蔡昌廷", 系所: "電信所碩士班_一年級 ", 身份: "校內生 ", 學號: "r09942038"})     |
| (:Student {姓名: "蕭如芸", 系所: "電信所碩士班_一年級 ", 身份: "校內生 ", 學號: "r09942069"})     |
| (:Student {姓名: "黃郁珊", 系所: "電信所碩士班_一年級 ", 身份: "校內生 ", 學號: "r09942089"})     |
| (:Student {姓名: "許之豪", 系所: "電信所碩士班_一年級 ", 身份: "校內生 ", 學號: "r09942141"})     |
| (:Student {姓名: "黃庭宇", 系所: "電信所碩士班_一年級 ", 身份: "校內生 ", 學號: "r09942142"})     |
| (:Student {姓名: "杜秉翰", 系所: "網媒所碩士班_一年級 ", 身份: "校內生 ", 學號: "r09944062"})     |
| (:Student {姓名: "曹佳穎", 系所: "資料科學學程碩士班_一年級 ", 身份: "校內生 ", 學號: "r09946013"}) |
| (:Student {姓名: "張焗郁", 系所: "資料科學學程碩士班_一年級 ", 身份: "校內生 ", 學號: "r09946031"}) |
| (:Student {姓名: "許 恒", 系所: "財金系_一年級 ", 身份: "校內生 ", 學號: "t09703328"})        |
| (:Student {姓名: "廖哲暉", 系所: "電機系_一年級 ", 身份: "校內生 ", 學號: "t09901311"})        |
| (:Student {姓名: "李 昀", 系所: "生技系_一年級 ", 身份: "校內生 ", 學號: "t09b02310"})        |
+-------------------------------------------------------------------------------------+

84 rows available after 12 ms, consumed after another 4 ms
Added 84 nodes, Set 336 properties, Added 84 labels
neo4j@neo4j>
```

Task 2

```
neo4j@neo4j> MATCH (self: Student {學號: 'r09922146'})
            MATCH (peer: Student {系所: "資工系碩士班_一年級 "})
            WHERE NOT peer.學號 = 'r09922146'
            CREATE (self)-[rel:peer]->(peer);
0 rows available after 13 ms, consumed after another 0 ms
Created 13 relationships
neo4j@neo4j>
```

Task 3

```
neo4j@neo4j> MATCH (selfAndPeer: Student {系所: "資工系碩士班_一年級 "})
            return collect(selfAndPeer);
+-------------------------------------------------------------------------------

| collect(selfAndPeer)

                                        |
+-------------------------------------------------------------------------------

| [(:Student {姓名: "吳政緯", 系所: "資工系碩士班 一年級 ", 身份: "校內生 ", 學號: "r09922003"}), (:Student {姓名: "林詩芩", 系所: "資工系碩士班 一年級 ", 身
份: "校內生 ", 學號: "r09922009"}), (:Student {姓名: "王柏元", 系所: "資工系碩士班 一年級 ", 身份: "校內生 ", 學號: "r09922056"}), (:Student {姓名: "鄭筠庭",
系所: "資工系碩士班 一年級 ", 身份: "校內生 ", 學號: "r09922063"}), (:Student {姓名: "曾尹均", 系所: "資工系碩士班 一年級 ", 身份: "校內生 ", 學號: "r09922080
"}), (:Student {姓名: "阮明皓", 系所: "資工系碩士班 一年級 ", 身份: "校內生 ", 學號: "r09922083"}), (:Student {姓名: "王文依", 系所: "資工系碩士班 一年級 "
身份: "校內生 ", 學號: "r09922090"}), (:Student {姓名: "陳昕璃", 系所: "資工系碩士班 一年級 ", 身份: "校內生 ", 學號: "r09922095"}), (:Student {姓名: "鍾育昌"
16"}), (:Student {姓名: "簡辰哲", 系所: "資工系碩士班 一年級 ", 身份: "校內生 ", 學號: "r09922146"}), (:Student {姓名: "簡丞瑞", 系所: "資工系碩士班 一年級 "
身份: "校內生 ", 學號: "r09922155"}), (:Student {姓名: "李昭妤", 系所: "資工系碩士班 一年級 ", 身份: "校內生 ", 學號: "r09922156"}), (:Student {姓名: "林琮珉
", 系所: "資工系碩士班 一年級 ", 身份: "校內生 ", 學號: "r09922167"})] |
+-------------------------------------------------------------------------------

1 row available after 1 ms, consumed after another 0 ms
neo4j@neo4j>
```

Part III

Task 1

property "hobbies" is a list of hobbies.

i.e.

hobbies:[hobby1, hobby2, hobby3, hobby4, hobby5]

```
neo4j@neo4j> LOAD CSV WITH HEADERS FROM "file:///hw6_hobbies.csv" AS row FIELDTERMINATOR ','
            CREATE (all:Student { 學號: row.學號, 姓名: row.姓名, hobbies: [row.hobby1, row.hobby2, row.hobby3, row.hobby4, row.hobby5]})
            return all;
+----------------------------------------------------------------------------------------------------------+
| all                                                                                                      |
+----------------------------------------------------------------------------------------------------------+
| (:Student {姓名: "杜承軒", 學號: "r07228005", hobbies: ["發廢文", "排球", "看youtube", "聽音樂", "唱歌"]})          |
| (:Student {姓名: "林祐辰", 學號: "r08323046", hobbies: ["看youtube", "看小說", "聽音樂", "玩遊戲", "飛翔"]})        |
| (:Student {姓名: "林容與", 學號: "b05505006", hobbies: ["無", "無", "無", "無", "無"]})                        |
| (:Student {姓名: "戴若竹", 學號: "b06507019", hobbies: ["跳舞", "看書", "攝影", "聽音樂", "吃美食"]})              |
| (:Student {姓名: "劉丁豪", 學號: "r08522313", hobbies: ["無", "無", "無", "無", "無"]})                        |
| (:Student {姓名: "張詠絜", 學號: "r09525060", hobbies: ["跳舞", "聽音樂", "彈吉他", "看劇", "看書"]})              |
| (:Student {姓名: "廖晨閔", 學號: "r09525068", hobbies: ["聊天", "吃美食", "健身", "追劇", "彈鋼琴"]})              |
| (:Student {姓名: "陳 顥", 學號: "r09525109", hobbies: ["無", "無", "無", "無", "無"]})                        |
| (:Student {姓名: "許述文", 學號: "r08631006", hobbies: ["攝影", "彈吉他", "爵士鼓", "看劇", "打荒野亂鬥意者私"]})       |
| (:Student {姓名: "許 恒", 學號: "t09703328", hobbies: ["看youtube", "看劇", "聽音樂", "看memes", "旅遊"]})       |
| (:Student {姓名: "廖偉丞", 學號: "b06704094", hobbies: ["足球", "電動", "看劇", "看漫畫", "無"]})                |
| (:Student {姓名: "馮正安", 學號: "b06705056", hobbies: ["健身", "手遊", "看劇", "社交軟體", "桌球"]})             |
| (:Student {姓名: "沈信樺", 學號: "b07901043", hobbies: ["彈吉他", "看動漫", "看youtube", "打lol", "吃東西"]})      |
| (:Student {姓名: "陳映樵", 學號: "b07901184", hobbies: ["看小說", "看書", "健身", "看youtube", "聽音樂"]})        |
| (:Student {姓名: "陳奐廷", 學號: "b06901023", hobbies: ["看電影", "看劇", "看棒球", "看youtube", "睡覺"]})        |
| (:Student {姓名: "葉曜德", 學號: "b06901046", hobbies: ["聽音樂", "唱歌", "跳舞", "烹飪", "騎腳踏車"]})             |
| (:Student {姓名: "陳宇軒", 學號: "b06901103", hobbies: ["看劇", "看電影", "游泳", "攝影", "聽音樂"]})             |
| (:Student {姓名: "郭芝均", 學號: "b06901164", hobbies: ["玩貓", "抱大白", "抱小白", "陪大白跳舞", "陪小白挖蜂蜜"]})      |
| (:Student {姓名: "林則仰", 學號: "b07902006", hobbies: ["籃球", "吃美食", "看劇", "打電動", "看youtube"]})        |
| (:Student {姓名: "蔡鈞濬", 學號: "b07902014", hobbies: ["看youtube", "打電動", "籃球", "聽音樂", "看動漫"]})       |
| (:Student {姓名: "張鈞堯", 學號: "b07902022", hobbies: ["羽球", "唱歌", "聽音樂", "騎車", "旅遊"]})              |
| (:Student {姓名: "李宥霆", 學號: "b07902048", hobbies: ["籃球", "游泳", "看youtube", "騎車", "看劇"]})           |
| (:Student {姓名: "許浩鳴", 學號: "b07902053", hobbies: ["看電影", "運動", "上網", "吃飯", "看Netflix"]})         |
| (:Student {姓名: "鄭世明", 學號: "b07902124", hobbies: ["籃球", "看劇", "打電動", "吃美食", "看youtube"]})        |
| (:Student {姓名: "陳義榮", 學號: "b06902001", hobbies: ["彈吉他", "吃美食", "看動漫", "攝影", "看youtube"]})       |
| (:Student {姓名: "黃紹輔", 學號: "b06902013", hobbies: ["無", "無", "無", "無", "無"]})                       |
| (:Student {姓名: "洪佳生", 學號: "b06902019", hobbies: ["無", "無", "無", "無", "無"]})                       |
| (:Student {姓名: "唐 浩", 學號: "b06902020", hobbies: ["無", "無", "無", "無", "無"]})                       |
| (:Student {姓名: "張道然", 學號: "b06902045", hobbies: ["Netflix", "看書", "聽 podcast", "看youtube", "運動"]})  |
| (:Student {姓名: "李 謙", 學號: "b06902072", hobbies: ["看動漫", "足球", "看輕小說", "吃拉麵", "看youtube"]})       |
| (:Student {姓名: "袁其崧", 學號: "b06902077", hobbies: ["無", "無", "無", "無", "無"]})                       |
| (:Student {姓名: "葉沛鎧", 學號: "r09921036", hobbies: ["看棒球", "打電動", "網球", "程式", "遛狗"]})             |
| (:Student {姓名: "林奕昀", 學號: "r09921051", hobbies: ["聽音樂", "看韓劇", "睡覺", "排球", "看綜藝"]})            |
| (:Student {姓名: "丁 維", 學號: "r09921064", hobbies: ["籃球", "排球", "youtube", "睡覺", "跳舞"]})            |
| (:Student {姓名: "黃賀伶", 學號: "r09921089", hobbies: ["聽音樂", "看韓劇", "睡覺", "看PTT", "看動畫"]})           |
| (:Student {姓名: "吳林宣", 學號: "r09921091", hobbies: ["打電動", "看漫畫", "看劇", "看實況", "寫程式"]})           |
| (:Student {姓名: "黃靖中", 學號: "r09921092", hobbies: ["學習mysql", "學習mariadb", "學習nosql", "學習graphdb", "寫db作業"]}) |
| (:Student {姓名: "張景翰", 學號: "r09921095", hobbies: ["打網球", "看網球", "讀書", "睡覺", "玩電動"]})            |
| (:Student {姓名: "廖顯新", 學號: "r09921096", hobbies: ["無", "無", "無", "無", "無"]})                       |
| (:Student {姓名: "楊智凱", 學號: "r09921104", hobbies: ["網球", "電動", "音樂", "Netflix", "Chill"]})          |
| (:Student {姓名: "何政剛", 學號: "r09921107", hobbies: ["無", "無", "無", "無", "無"]})                       |
| (:Student {姓名: "白曜瑋", 學號: "r08921050", hobbies: ["看棒球", "打電動", "看youtube", "看動畫", "寫 code"]})     |
| (:Student {姓名: "羅浩倫", 學號: "r08921051", hobbies: ["看動畫", "看漫畫", "唱歌", "手遊", "寫 code"]})          |
| (:Student {姓名: "洪瑞隆", 學號: "r08921a02", hobbies: ["彈鋼琴", "打電動", "看漫畫", "看youtube", "看小說"]})      |
| (:Student {姓名: "吳政緯", 學號: "r09922003", hobbies: ["打羽球", "騎腳踏車", "看電影", "爬山", "旅遊"]})           |
| (:Student {姓名: "林詩芩", 學號: "r09922009", hobbies: ["寫 code", "睡覺", "看動畫", "玩手遊", "看漫畫"]})         |
| (:Student {姓名: "王柏元", 學號: "r09922056", hobbies: ["無", "無", "無", "無", "無"]})                       |
| (:Student {姓名: "鄭筠庭", 學號: "r09922063", hobbies: ["畫圖", "看電影", "看遊戲實況", "聽音樂", "逛展"]})           |
| (:Student {姓名: "曾尹均", 學號: "r09922080", hobbies: ["看電影", "看書", "游泳", "旅遊", "跳舞"]})              |
| (:Student {姓名: "阮明皓", 學號: "r09922083", hobbies: ["電影", "看書", "聽團", "打棒球", "耍廢"]})              |
| (:Student {姓名: "王文依", 學號: "r09922090", hobbies: ["看韓劇", "看youtube", "吃美食", "睡覺", "看ptt"]})        |
| (:Student {姓名: "陳昕璐", 學號: "r09922095", hobbies: ["無", "無", "無", "無", "無"]})                       |
| (:Student {姓名: "鍾育昌", 學號: "r09922111", hobbies: ["學外文", "打電動", "看youtube", "聊天", "聽音樂"]})        |
| (:Student {姓名: "邱聖約", 學號: "r09922116", hobbies: ["睡覺", "打電動", "寫程式", "寫作業", "上課"]})            |
| (:Student {姓名: "簡辰哲", 學號: "r09922146", hobbies: ["無", "無", "無", "無", "無"]})                       |
| (:Student {姓名: "簡丞珮", 學號: "r09922155", hobbies: ["看綜藝", "看劇", "聽音樂", "跑步", "睡覺"]})             |
| (:Student {姓名: "李昭妤", 學號: "r09922156", hobbies: ["看Netflix", "吃甜點", "跟貓咪玩", "睡覺", "看韓劇"]})        |
| (:Student {姓名: "林琮珉", 學號: "r09922167", hobbies: ["電玩", "迷因", "睡覺", "youtube廢片", "排球"]})          |
| (:Student {姓名: "王 甯", 學號: "r08922099", hobbies: ["騎單車", "寫 code", "睡覺", "看youtube", "看遊戲實況"]})    |
| (:Student {姓名: "王俞禮", 學號: "r08922181", hobbies: ["無", "無", "無", "無", "無"]})                       |
| (:Student {姓名: "蔡昌廷", 學號: "r09942038", hobbies: ["看棒球", "看漫畫", "玩手遊", "打棒球", "看youtube"]})       |
| (:Student {姓名: "蕭如芸", 學號: "r09942069", hobbies: ["寫程式", "看棒球", "睡覺", "看Netflix", "玩魔術"]})        |
| (:Student {姓名: "黃郁珊", 學號: "r09942089", hobbies: ["看電視劇", "看綜藝", "逛街買東西", "看舞台劇", "打羽球"]})       |
| (:Student {姓名: "許之豪", 學號: "r09942141", hobbies: ["看youtube", "打電動", "睡覺", "看劇", "看ptt"]})         |
| (:Student {姓名: "鄭元嘉", 學號: "r08942154", hobbies: ["程式", "看喜劇", "Netflix", "睡覺", "聽 podcast"]})      |
| (:Student {姓名: "翁嬿婷", 學號: "r08942155", hobbies: ["看youtube", "聽音樂", "跳舞", "睡覺", "唱歌"]})          |
| (:Student {姓名: "徐子崴", 學號: "r08942160", hobbies: ["程式", "打電動", "Netflix", "睡覺", "看youtube"]})       |
| (:Student {姓名: "杜秉翰", 學號: "r09944062", hobbies: ["騎單車", "爬山", "看youtube", "看ptt", "打籃球"]})        |
| (:Student {姓名: "曾昱衡", 學號: "r08945056", hobbies: ["看youtube", "手遊", "飛鏢", "騎車", "排球"]})           |
| (:Student {姓名: "曹佳穎", 學號: "r09946013", hobbies: ["看劇", "寫程式", "看書", "聽音樂", "打球"]})             |
| (:Student {姓名: "張燗郁", 學號: "r09946031", hobbies: ["打網球", "看劇", "爬山", "看3C", "開發美食"]})            |
+----------------------------------------------------------------------------------------------------------+

71 rows available after 9 ms, consumed after another 5 ms
Added 71 nodes, Set 213 properties, Added 71 labels
neo4j@neo4j>
```

Task 2


```
neo4j@neo4j> MATCH (self: Student {學號: "r07228005"}), (friend: Student)
             WHERE ANY(x IN self.hobbies where x IN friend.hobbies) AND NOT friend.學號 = "r07228005"
             WITH self, friend
             MATCH (self), (friend)
             CREATE (self)-[rel:IS_FRIENDS_WITH]->(friend)
             WITH self, friend
             MATCH (friend), (foaf)
             WHERE ANY(x IN friend.hobbies WHERE x IN foaf.hobbies) AND NOT foaf.學號 = "r07228005" AND NOT exists((self)-[:IS_FRIENDS_WITH]->(foaf))
             RETURN collect(DISTINCT foaf.姓名), foaf.hobbies;
```

collect(DISTINCT foaf.姓名)	foaf.hobbies
["戴若竹"]	["跳舞", "看書", "攝影", "聽音樂", "吃美食"]
["張詠絜"]	["跳舞", "聽音樂", "彈吉他", "看劇", "看書"]
["許 恒"]	["看youtube", "看劇", "聽音樂", "看memes", "旅遊"]
["沈信樺"]	["彈吉他", "看動漫", "看youtube", "打lol", "吃東西"]
["陳映樵"]	["看小說", "看書", "健身", "看youtube", "聽音樂"]
["陳奐廷"]	["看電影", "看劇", "看棒球", "看youtube", "睡覺"]
["葉曜德"]	["聽音樂", "唱歌", "跳舞", "烹飪", "騎腳踏車"]
["陳宇軒"]	["看劇", "看電影", "游泳", "攝影", "聽音樂"]
["林則仰"]	["籃球", "吃美食", "看劇", "打電動", "看youtube"]
["蔡承濬"]	["看youtube", "打電動", "籃球", "聽音樂", "看動漫"]
["張鈞堯"]	["羽球", "唱歌", "聽音樂", "騎車", "旅遊"]
["李宥霆"]	["籃球", "游泳", "看youtube", "騎車", "看劇"]
["鄭世朋"]	["籃球", "看劇", "打電動", "吃美食", "看youtube"]
["陳義榮"]	["彈吉他", "吃美食", "看動漫", "攝影", "看youtube"]
["張道然"]	["Netflix", "看書", "聽 podcast", "看youtube", "運動"]
["李 謙"]	["看動漫", "足球", "看輕小說", "吃拉麵", "看youtube"]
["林奕昀"]	["聽音樂", "看韓劇", "睡覺", "排球", "看綜藝"]
["丁 維"]	["籃球", "排球", "youtube", "睡覺", "聽音樂"]
["黃賀伶"]	["聽音樂", "看韓劇", "睡覺", "看PTT", "看動畫"]
["白曜瑋"]	["看棒球", "打電動", "看youtube", "看動畫", "寫 code"]
["洪瑞隆"]	["彈鋼琴", "打電動", "看漫畫", "看youtube", "看小說"]
["鄭筠庭"]	["畫圖", "看電影", "看遊戲實況", "聽音樂", "逛展"]
["王文依"]	["看韓劇", "看youtube", "吃美食", "睡覺", "看ptt"]
["鍾育昌"]	["學外文", "打電動", "看youtube", "聊天", "聽音樂"]
["簡亦珮"]	["看綜藝", "看劇", "聽音樂", "跑步", "睡覺"]
["王 甯"]	["騎單車", "寫 code", "睡覺", "看youtube", "看遊戲實況"]
["蔡昌廷"]	["看棒球", "看漫畫", "玩手遊", "打棒球", "看youtube"]
["許之豪"]	["看youtube", "打電動", "睡覺", "看劇", "看ptt"]
["翁嬿婷"]	["看youtube", "聽音樂", "跳舞", "睡覺", "唱歌"]
["徐子崴"]	["程式", "打電動", "Netflix", "睡覺", "看youtube"]
["杜秉翰"]	["騎單車", "爬山", "看youtube", "看ptt", "打籃球"]
["曾昱衡"]	["看youtube", "手遊", "飛鏢", "騎車", "排球"]
["曹佳穎"]	["看劇", "寫程式", "看書", "聽音樂", "打球"]
["廖晨閔"]	["聊天", "吃美食", "健身", "追劇", "彈鋼琴"]
["許述文"]	["攝影", "彈吉他", "爵士鼓", "看劇", "打荒野亂鬥意者私"]
["曾尹均"]	["看電影", "看書", "游泳", "旅遊", "跳舞"]
["阮明皓"]	["電影", "看書", "聽團", "打棒球", "耍廢"]
["廖偉丞"]	["足球", "電動", "看劇", "看漫畫", "無"]
["馮正安"]	["健身", "手遊", "看劇", "社交軟體", "桌球"]
["吳林宣"]	["打電動", "看漫畫", "看劇", "看實況", "寫程式"]
["張炯郁"]	["打網球", "看劇", "爬山", "看3C", "開發美食"]
["吳政緯"]	["打羽球", "騎腳踏車", "看電影", "爬山", "旅遊"]
["許浩鳴"]	["看電影", "運動", "上網", "吃飯", "看Netflix"]
["葉沛鈺"]	["看棒球", "打電動", "網球", "程式", "遛狗"]
["張景翰"]	["打網球", "看網球", "讀書", "睡覺", "玩電動"]
["林詩岑"]	["寫 code", "睡覺", "看動畫", "玩手遊", "看漫畫"]
["邱聖約"]	["睡覺", "打電動", "寫程式", "寫作業", "上課"]
["李昭妤"]	["看Netflix", "吃甜點", "跟貓咪玩", "睡覺", "看韓劇"]
["林琮珉"]	["電玩", "迷因", "睡覺", "youtube廢片", "排球"]
["蕭如芸"]	["寫程式", "看棒球", "睡覺", "看Netflix", "玩魔術"]
["鄭元嘉"]	["程式", "看喜劇", "Netflix", "睡覺", "聽 podcast"]
["羅浩倫"]	["看動畫", "看漫畫", "唱歌", "手遊", "寫 code"]
["楊智凱"]	["網球", "電動", "音樂", "Netflix", "Chill"]
["黃郁珊"]	["看電視劇", "看綜藝", "逛街買東西", "看舞台劇", "打羽球"]

```
54 rows available after 35 ms, consumed after another 51 ms
Created 36 relationships
```

使用"杜承軒"同學為例

//filter out **friend**，friend 有至少一個共同 hobby 且 friend 不能是自己

MATCH (self: Student {學號: "r07228005"}), (friend: Student)

WHERE ANY(x IN self.hobbies where x IN friend.hobbies) AND NOT friend.學號 = "r07228005"

//建立自己與 friend 的關係

WITH self, friend

MATCH (self), (friend)

CREATE (self)-[rel:IS_FRIENDS_WITH]->(friend)

//filter out **foaf**，foaf 與 friend 有至少一個共同 hobby 且 foaf 不能是自己，且 foaf 不能是 friend

WITH self, friend

MATCH (friend), (foaf)

WHERE ANY(x IN friend.hobbies WHERE x IN foaf.hobbies) AND NOT foaf.學號 = "r07228005" AND NOT exists((self)-[:IS_FRIENDS_WITH]->(foaf))

RETURN collect(DISTINCT foaf.姓名), foaf.hobbies;

Task3

```
neo4j@neo4j> MATCH (self: Student {學號: "r07228005"}), (friend: Student)
             WHERE ANY(x IN self.hobbies where x IN friend.hobbies) AND NOT friend.學號 = "r07228005"
             WITH self, friend
             MATCH (self), (friend)
             CREATE (self)-[rel:IS_FRIENDS_WITH]->(friend)
             WITH self, friend
             MATCH (friend), (foaf)
             WHERE ANY(x IN friend.hobbies WHERE x IN foaf.hobbies) AND NOT foaf.學號 = "r07228005" AND NOT exists((self)-[:IS_FRIENDS_WITH]->(foaf))
             UNWIND foaf.hobbies AS NH
             return DISTINCT NH;
+-------------+
| NH          |
+-------------+
| "看動漫"        |
| "足球"         |
| "看輕小說"       |
| "吃拉麵"        |
| "看youtube"   |
| "網球"         |
| "電動"         |
| "音樂"         |
| "Netflix"    |
| "Chill"      |
| "看棒球"        |
| "打電動"        |
| "看動畫"        |
| "寫 code"     |
| "彈鋼琴"        |
| "看漫畫"        |
| "看小說"        |
| "看電影"        |
| "看書"         |
| "游泳"         |
| "旅遊"         |
| "跳舞"         |
| "電影"         |
| "聽團"         |
| "打棒球"        |
| "耍廢"         |
| "看韓劇"        |
| "吃美食"        |
| "睡覺"         |
| "看ptt"       |
| "學外文"        |
| "聊天"         |
| "聽音樂"        |
| "騎單車"        |
| "看遊戲實況"      |
| "玩手遊"        |
| "看劇"         |
| "程式"         |
| "看喜劇"        |
| "聽 podcast"  |
| "唱歌"         |
| "爬山"         |
| "打籃球"        |
| "手遊"         |
| "飛鏢"         |
| "騎車"         |
| "排球"         |
| "寫程式"        |
| "打球"         |
| "玩遊戲"        |
| "飛翔"         |
| "攝影"         |
| "彈吉他"        |
| "看memes"     |
| "打lol"       |
| "吃東西"        |
| "健身"         |
| "籃球"         |
| "運動"         |
| "上網"         |
| "吃飯"         |
| "看Netflix"   |
| "無"          |
| "youtube"    |
| "看PTT"       |
| "打網球"        |
| "看網球"        |
| "讀書"         |
| "玩電動"        |
| "畫圖"         |
| "逛展"         |
| "寫作業"        |
| "上課"         |
| "看綜藝"        |
| "跑步"         |
| "吃甜點"        |
| "跟貓咪玩"       |
| "電玩"         |
| "迷因"         |
| "youtube廢片"  |
| "玩魔術"        |
| "看電視劇"       |
| "逛街買東西"      |
| "看舞台劇"       |
| "打羽球"        |
| "烹飪"         |
| "騎腳踏車"       |
| "羽球"         |
| "遛狗"         |
| "看實況"        |
| "社交軟體"       |
| "桌球"         |
| "追劇"         |
| "看3C"        |
| "開發美食"       |
| "爵士鼓"        |
| "打荒野亂鬥意者私"   |
+-------------+

97 rows available after 30 ms, consumed after another 28 ms
Created 36 relationships
neo4j@neo4j>
```

MATCH (self: Student {學號: "r07228005"}), (friend: Student)

WHERE ANY(x IN self.hobbies where x IN friend.hobbies) AND NOT friend.學號 = "r07228005"

WITH self, friend

MATCH (self), (friend)

CREATE (self)-[rel:IS_FRIENDS_WITH]->(friend)

WITH self, friend

MATCH (friend), (foaf)

WHERE ANY(x IN friend.hobbies WHERE x IN foaf.hobbies) AND NOT foaf.學號 = "r07228005" AND

NOT exists((self)-[:IS_FRIENDS_WITH]->(foaf))

UNWIND foaf.hobbies AS NH

return DISTINCT NH;