7.2.1,4

// 创建3个账户人

**CREATE** (accountHolder1:AccountHolder {

FirstName: "John",

LastName: "Doe",

UniqueId: "JohnDoe" })

**CREATE** (accountHolder2:AccountHolder {

FirstName: "Jane",

LastName: "Appleseed",

UniqueId: "JaneAppleseed" })

**CREATE** (accountHolder3:AccountHolder {

FirstName: "Matt",

LastName: "Smith",

UniqueId: "MattSmith" })

// 创建地址1

**CREATE** (address1:Address {

Street: "123 NW 1st Street",

City: "San Francisco",

State: "California",

ZipCode: "94101" })

// 把账户人1、账户人2和账户人3关联到地址1

**CREATE** (accountHolder1)-[:HAS\_ADDRESS]->(address1),

(accountHolder2)-[:HAS\_ADDRESS]->(address1),

(accountHolder3)-[:HAS\_ADDRESS]->(address1)

// 创建电话号码1

**CREATE** (phoneNumber1:PhoneNumber { PhoneNumber: "555-555-5555" })

// 把账户人1和账户人2关联到电话号码1

**CREATE** (accountHolder1)-[:HAS\_PHONENUMBER]->(phoneNumber1),

(accountHolder2)-[:HAS\_PHONENUMBER]->(phoneNumber1)

// 创建社会安全码SSN1

**CREATE** (ssn1:SSN { SSN: "241-23-1234" })

// 把账户人2和账户人3关联到SSN1

**CREATE** (accountHolder2)-[:HAS\_SSN]->(ssn1),

(accountHolder3)-[:HAS\_SSN]->(ssn1)

// 创建社会安全码SSN2并关联到账户人1

**CREATE** (ssn2:SSN { SSN: "241-23-4567" })<-[:HAS\_SSN]-(accountHolder1)

// 创建信用卡号1并关联到账户人1

**CREATE** (creditCard1:CreditCard {

AccountNumber: "1234567890123456",

**Limit**: 5000, Balance: 1442.23,

ExpirationDate: "01-20",

SecurityCode: "123" })<-[:HAS\_CREDITCARD]-(accountHolder1)

// 创建银行账号并关联到账户人1

**CREATE** (bankAccount1:BankAccount {

AccountNumber: "2345678901234567",

Balance: 7054.43 })<-[:HAS\_BANKACCOUNT]-(accountHolder1)

// 创建信用卡2并关联到账户人2

**CREATE** (creditCard2:CreditCard {

AccountNumber: "1234567890123456",

**Limit**: 4000, Balance: 2345.56,

ExpirationDate: "02-20",

SecurityCode: "456" })<-[:HAS\_CREDITCARD]-(accountHolder2)

// 创建银行账号2并连接到账户人2

**CREATE** (bankAccount2:BankAccount {

AccountNumber: "3456789012345678",

Balance: 4231.12 })<-[:HAS\_BANKACCOUNT]-(accountHolder2)

// 创建无抵押贷款2并关联到账户人2

**CREATE** (unsecuredLoan2:UnsecuredLoan {

AccountNumber: "4567890123456789-0",

Balance: 9045.53,

APR: .0541,

LoanAmount: 12000.00 })<-[:HAS\_UNSECUREDLOAN]-(accountHolder2)

// 创建银行账号3并关联到账户人3

**CREATE** (bankAccount3:BankAccount {

AccountNumber: "4567890123456789",

Balance: 12345.45 })<-[:HAS\_BANKACCOUNT]-(accountHolder3)

// 创建无抵押贷款3并关联到账号人3

**CREATE** (unsecuredLoan3:UnsecuredLoan {

AccountNumber: "5678901234567890-0",

Balance: 16341.95, APR: .0341,

LoanAmount: 22000.00 })<-[:HAS\_UNSECUREDLOAN]-(accountHolder3)

// 创建电话号码2并关联到账户人3

**CREATE** (phoneNumber2:PhoneNumber {

PhoneNumber: "555-555-1234" })<-[:HAS\_PHONENUMBER]-(accountHolder3)

**RETURN** \*

7.2.1,5

**MATCH** (accountHolder:AccountHolder)-[]->(contactInformation)

**WITH** contactInformation,

count(accountHolder) **AS** RingSize

**MATCH** (contactInformation)<-[]-(accountHolder)

**WITH** collect(accountHolder.UniqueId) **AS** AccountHolders,

contactInformation, RingSize

**WHERE** RingSize > 1

**RETURN** AccountHolders **AS** FraudRing,

labels(contactInformation) **AS** ContactType,

RingSize

**ORDER** **BY** RingSize **DESC**

7.2.1,6

**MATCH** (accountHolder:AccountHolder)-[]->(contactInformation)

**WITH** contactInformation,

count(accountHolder) **AS** RingSize

**MATCH** (contactInformation)<-[]-(accountHolder),

(accountHolder)-[r:HAS\_CREDITCARD|HAS\_UNSECUREDLOAN]->(unsecuredAccount)

**WITH** collect(**DISTINCT** accountHolder.UniqueId) **AS** AccountHolders,

contactInformation, RingSize,

SUM(**CASE** type(r)

**WHEN** 'HAS\_CREDITCARD' **THEN** unsecuredAccount.Limit

**WHEN** 'HAS\_UNSECUREDLOAN' **THEN** unsecuredAccount.Balance

**ELSE** 0

**END**) **as** FinancialRisk

**WHERE** RingSize > 1

**RETURN** AccountHolders **AS** FraudRing,

labels(contactInformation) **AS** ContactType,

RingSize,

round(FinancialRisk) **as** FinancialRisk

**ORDER** **BY** FinancialRisk **DESC**

7.2.2,4

**CREATE**

(事故1:假事故{事故名:"事故1"}),

(事故2:假事故{事故名:"事故2"}),

(车1:交通工具{作者名:"车1"}),

(车2:交通工具{作者名:"车2"}),

(车3:交通工具{作者名:"车3"}),

(车4:交通工具{作者名:"车4"}),

(参与者1:参与者{名称:"参与者1"}),

(参与者2:参与者{名称:"参与者2"}),

(参与者3:参与者{名称:"参与者3"}),

(保险代理人:参与者{名称:"保险代理人"}),

(医生:参与者{名称:"医生"}),

(律师:参与者{名称:"律师"}),

(车1)-[:卷入]->(事故1),

(车2)-[:卷入]->(事故1),

(车3)-[:卷入]->(事故2),

(车4)-[:卷入]->(事故2),

(参与者1)-[:驾驶]->(车1),

(参与者2)-[:驾驶]->(车2),

(参与者3)-[:驾驶]->(车4),

(参与者1)-[:目击证人]->(车3),

(参与者2)-[:搭乘]->(车3),

(律师)-[:评定]->(车4),

(保险代理人)-[:保险代理]->(参与者1),

(保险代理人)-[:保险代理]->(参与者3),

(医生)-[:治疗]->(参与者3)

**RETURN** \*

7.3,2

**CREATE**

(张教授:研究人员{姓名:"张教授"}),

(李老师:研究人员{姓名:"李老师"}),

(王老师:研究人员{姓名:"王老师"}),

(论文1:论文{论文名:"论文1"}),

(论文2:论文{论文名:"论文2"}),

(论文3:论文{论文名:"论文3"}),

(论文4:论文{论文名:"论文4"}),

(论文5:论文{论文名:"论文5"}),

(论文6:论文{论文名:"论文6"}),

(论文7:论文{论文名:"论文7"}),

(论文8:论文{论文名:"论文8"}),

(学术期刊1:期刊{刊名:"学术期刊1"}),

(学术期刊2:期刊{刊名:"学术期刊2"}),

(学术期刊3:期刊{刊名:"学术期刊3"}),

(关键词1\_1:关键词{词名:"关键词1\_1"}),

(关键词1\_2:关键词{词名:"关键词1\_2"}),

(关键词1\_3:关键词{词名:"关键词1\_3"}),

(关键词2\_1:关键词{词名:"关键词2\_1"}),

(关键词2\_2:关键词{词名:"关键词2\_2"}),

(关键词2\_3:关键词{词名:"关键词2\_3"}),

(关键词5\_1:关键词{词名:"关键词3\_1"}),

(关键词5\_2:关键词{词名:"关键词3\_2"}),

(关键词5\_3:关键词{词名:"关键词3\_3"}),

(张教授)-[:作者]->(论文1),

(张教授)-[:作者]->(论文2),

(张教授)-[:作者]->(论文3),

(张教授)-[:作者]->(论文4),

(张教授)-[:作者]->(论文5),

(张教授)-[:作者]->(论文6),

(张教授)-[:作者]->(论文7),

(张教授)-[:作者]->(论文8),

(李老师)-[:作者]->(论文1),

(李老师)-[:作者]->(论文2),

(王老师)-[:作者]->(论文5),

(王老师)-[:作者]->(论文6),

(论文1)-[:发表]->(学术期刊1),

(论文2)-[:发表]->(学术期刊1),

(论文3)-[:发表]->(学术期刊1),

(论文4)-[:发表]->(学术期刊2),

(论文5)-[:发表]->(学术期刊2),

(论文6)-[:发表]->(学术期刊2),

(论文7)-[:发表]->(学术期刊3),

(论文8)-[:发表]->(学术期刊3),

(论文1)-[:关键词]->( 关键词1\_1),

(论文1)-[:关键词]->( 关键词1\_2),

(论文1)-[:关键词]->( 关键词1\_3),

(论文2)-[:关键词]->( 关键词2\_1),

(论文2)-[:关键词]->( 关键词2\_2),

(论文2)-[:关键词]->( 关键词2\_3),

(论文3)-[:关键词]->( 关键词2\_3),

(论文4)-[:关键词]->( 关键词1\_2),

(论文5)-[:关键词]->( 关键词5\_1),

(论文5)-[:关键词]->( 关键词5\_2),

(论文5)-[:关键词]->( 关键词5\_3),

(论文6)-[:关键词]->( 关键词2\_1),

(论文7)-[:关键词]->( 关键词5\_1),

(论文8)-[:关键词]->( 关键词5\_2)

**RETURN** \*

7.3,3

**CREATE**

(论文1:论文图谱{论文名:"论文1"}),

(论文2:论文图谱{论文名:"论文2"}),

(论文3:论文图谱{论文名:"论文3"}),

(论文4:论文图谱{论文名:"论文4"}),

(论文5:论文图谱{论文名:"论文5"}),

(论文6:论文图谱{论文名:"论文6"}),

(论文7:论文图谱{论文名:"论文7"}),

(论文1)-[:相似]->(论文2),

(论文1)-[:相似]->(论文3),

(论文2)-[:相似]->(论文4),

(论文2)-[:相似]->(论文5),

(论文3)-[:相似]->(论文5),

(论文5)-[:相似]->(论文6),

(论文7)-[:相似]->(论文2),

(论文7)-[:相似]->(论文6)

**RETURN** \*

7.3，4

**CREATE**

(作者1:论文作者{作者名:"作者1"}),

(作者2:论文作者{作者名:"作者2"}),

(作者3:论文作者{作者名:"作者3"}),

(作者4:论文作者{作者名:"作者4"}),

(作者5:论文作者{作者名:"作者5"}),

(作者6:论文作者{作者名:"作者6"}),

(作者1)-[:论文合作]->(作者2),

(作者1)-[:论文合作]->(作者3),

(作者2)-[:论文合作]->(作者4),

(作者2)-[:论文合作]->(作者5),

(作者3)-[:论文合作]->(作者5),

(作者5)-[:论文合作]->(作者6)

**RETURN** \*

7.4,4

**CREATE**

(A:Person{account:"fhdhfhgxcvvxg@163.com"}),

(B:Person{account:"yrdudthfffxddh@126.com"}),

(C1: Person{account:"rbs0901@gmail.com"}),

(C2: Person{account:"eo.lambro@gmail.com "}),

(C3: Person{account:"i.rao@gmail.com "}),

(C4: Person{account:"yuanli@gmail.com "}),

(C5: Person{account:"hoke@gmail.com "}),

(C6: Person{account:"zeta@gmail.com "}),

(D1: Person{account:"uida@sinoclc.com"}),

(D2: Person{account:"uwafir@sinoclc.com"}),

(D3: Person{account:"areg@sinoclc.com"}),

(D4: Person{account:"intern11@sinoclc.com"}),

(D5: Person{account:"liduo@sinoclc.com"}),

(E1: Email{time:"20160802 04:58:01",title:"发票"}),

(E2: Email{time:"20160802 04:58:02",title:"发票"}),

(E3: Email{time:"20160802 04:58:03",title:"发票"}),

(E4: Email{time:"20160802 04:58:04",title:"发票"}),

(E5: Email{time:"20160802 04:58:05",title:"发票"}),

(E6: Email{time:"20160802 04:58:06",title:"发票"}),

(F1: Email{time:"20170308 05:15:01",title:"招聘"}),

(F2: Email{time:"20170308 05:15:02",title:"招聘"}),

(F3: Email{time:"20170308 05:15:03",title:"招聘"}),

(F4: Email{time:"20170308 05:15:04",title:"招聘"}),

(F5: Email{time:"20170308 05:15:05",title:"招聘"}),

(A)-[:SEND]->(E1)-[:TO]-> (C1),

(A)-[:SEND]->(E2)-[:TO]-> (C2),

(A)-[:SEND]->(E3)-[:TO]-> (C3),

(A)-[:SEND]->(E4)-[:TO]-> (C4),

(A)-[:SEND]->(E5)-[:TO]-> (C5),

(A)-[:SEND]->(E6)-[:TO]-> (C6),

(B)-[:SEND]->(F1)-[:TO]-> (D1),

(B)-[:SEND]->(F2)-[:TO]-> (D2),

(B)-[:SEND]->(F3)-[:TO]-> (D3),

(B)-[:SEND]->(F4)-[:TO]-> (D4),

(B)-[:SEND]->(F5)-[:TO]-> (D5)

**RETURN** \*

7.5，2

**create** (中化集团:公司{名字:"中化集团"}),

(中国石化:公司{名字:"中国石化"}),

(北京信托:公司{名字:"北京信托"}),

(中化国际:公司{名字:"中化国际"}),

(中化天然气:公司{名字:"中化天然气"}),

(福建炼化:公司{名字:"福建炼化"}),

(中化润滑:公司{名字:"中化润滑"}),

(广东中贸:公司{名字:"广东中贸"}),

(广州天马:公司{名字:"广州天马"}),

(泛华公司:公司{名字:"泛华公司"}),

(泰达科技:公司{名字:"泰达科技"}),

(国都证券:公司{名字:"国都证券"}),

(江西投燃:公司{名字:"江西投燃"}),

(湖北天然气:公司{名字:"湖北天然气"}),

(华恒能源:公司{名字:"华恒能源"}),

(中化集团)-[:控股]->(中国石化),

(中国石化)-[:控股]->(北京信托),

(中国石化)-[:控股]->(中化国际),

(中国石化)-[:控股]->(中化天然气),

(中国石化)-[:控股]->(福建炼化),

(中国石化)-[:控股]->(中化润滑),

(中国石化)-[:控股]->(广东中贸),

(北京信托)-[:控股]->(广州天马),

(北京信托)-[:控股]->(泛华公司),

(北京信托)-[:控股]->(泰达科技),

(北京信托)-[:控股]->(国都证券),

(中化天然气)-[:控股]->(江西投燃),

(中化天然气)-[:控股]->(湖北天然气),

(中化天然气)-[:控股]->(华恒能源),

(王某:高管{名字:"王某"}),

(张某:高管{名字:"张某"}),

(樊某:高管{名字:"樊某"}),

(李某:高管{名字:"李某"}),

(阎某: 高管{名字:"阎某"}),

(蒋某:高管{名字:"蒋某"}),

(章某:高管{名字:"章某"}),

(汤某:高管{名字:"汤某"}),

(戴某:高管{名字:"戴某"}),

(焦某:高管{名字:"焦某"}),

(刘某:高管{名字:"刘某"}),

(邹某:高管{名字:"邹某"}),

(刘某云:高管{名字:"刘某云"}),

(周某:高管{名字:"周某"}),

(俞某:高管{名字:"俞某"}),

(王某钧:高管{名字:"王某钧"}),

(王某)-[:法人]->(中化集团),

(王某)-[:法人]->(中国石化),

(张某)-[:董事]->(中国石化),

(樊某)-[:董事]->(中国石化),

(李某)-[:董事]->(中国石化),

(阎某)-[:董事]->(中国石化),

(蒋某)-[:董事]->(中国石化),

(章某)-[:董事]->(中国石化),

(汤某)-[:董事]->(中国石化),

(戴某)-[:董事]->(中国石化),

(焦某)-[:董事]->(中国石化),

(王某)-[:董事长]->(中国石化),

(刘某)-[:监事会主席]->(中国石化),

(邹某)-[:监事]->(中国石化),

(刘某云)-[:监事]->(中国石化),

(周某)-[:监事]->(中国石化),

(俞某)-[:监事]->(中国石化),

(王某钧)-[:监事]->(中国石化),

(北京国讯:公司{名字:"北京国讯"}),

(五十人论坛:公司{名字:"五十人论坛"}),

(王某扬:高管{名字:"王某扬"}),

(乔某:高管{名字:"乔某"}),

(朱某:高管{名字:"朱某"}),

(徐某:高管{名字:"徐某"}),

(樊某)-[:监事]-> (北京国讯),

(王某扬)-[:总经理]-> (北京国讯),

(王某扬)-[:参股]-> (北京国讯),

(乔某)-[:法人]-> (北京国讯),

(乔某)-[:执行董事]-> (北京国讯),

(乔某)-[:参股]-> (北京国讯),

(樊某)-[:参股]-> (五十人论坛),

(朱某)-[:监事]-> (五十人论坛),

(徐某)-[:执行董事]-> (五十人论坛),

(徐某)-[:总经理]-> (五十人论坛),

(徐某)-[:参股]-> (五十人论坛),

(徐某)-[:法人]-> (五十人论坛)

7.6，3

**CREATE**

(小北:朋友圈{姓名: "小北"}),

(小菲:朋友圈{姓名: "小菲"}),

(小鹏:朋友圈{姓名: "小鹏"}),

(小颖:朋友圈{姓名: "小颖"}),

(小兰:朋友圈{姓名: "小兰"}),

(小锋:朋友圈{姓名: "小锋"}),

(小讯:朋友圈{姓名: "小讯"}),

(小东:朋友圈{姓名: "小东"}),

(小唯:朋友圈{姓名: "小唯"}),

(小窦:朋友圈{姓名: "小窦"}),

(小齐:朋友圈{姓名: "小齐"}),

(小林:朋友圈{姓名: "小林"}),

(小锐:朋友圈{姓名: "小锐"}),

(小伟:朋友圈{姓名: "小伟"}),

(小玲:朋友圈{姓名: "小玲"}),

(小讯)-[:认识]->(小窦),

(小讯)-[:认识]->(小齐),

(小讯)-[:认识]->(小林),

(小讯)-[:认识]->(小鹏),

(小讯)-[:认识]->(小伟),

(小讯)-[:认识]->(小锋),

(小菲)-[:认识]->(小鹏),

(小菲)-[:认识]->(小锋),

(小菲)-[:认识]->(小唯),

(小锋)-[:认识]->(小北),

(小锋)-[:认识]->(小兰),

(小东)-[:认识]->(小林),

(小东)-[:认识]->(小锐),

(小东)-[:认识]->(小菲),

(小鹏)-[:认识]->(小颖),

(小北)-[:认识]->(小兰),

(小颖)-[:认识]->(小东),

(小唯)-[:认识]->(小鹏),

(小唯)-[:认识]->(小锐),

(小伟)-[:认识]->(小玲),

(小菲)-[:认识]->(小玲)