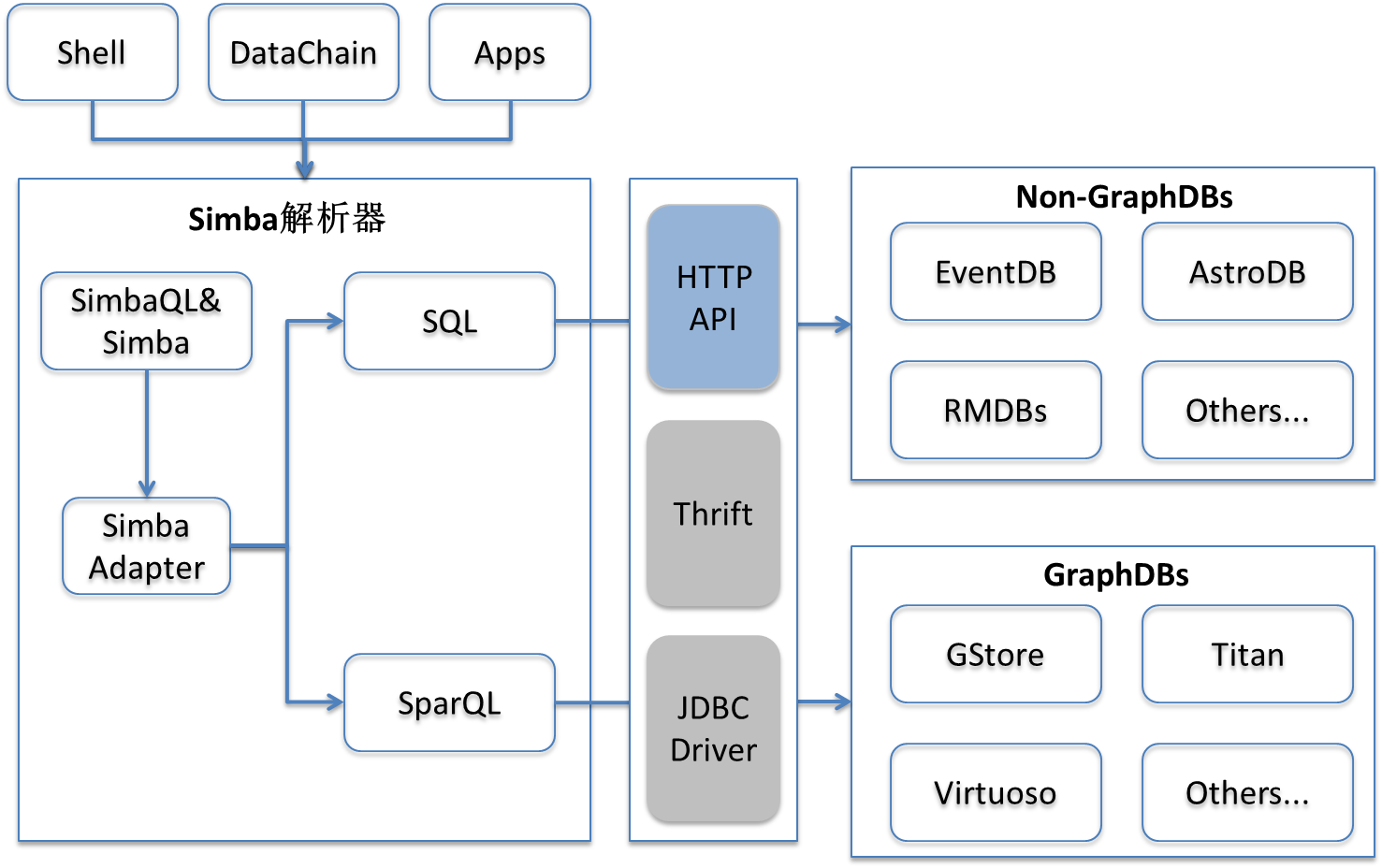
# 大数据访问接口

### 数据访问框架

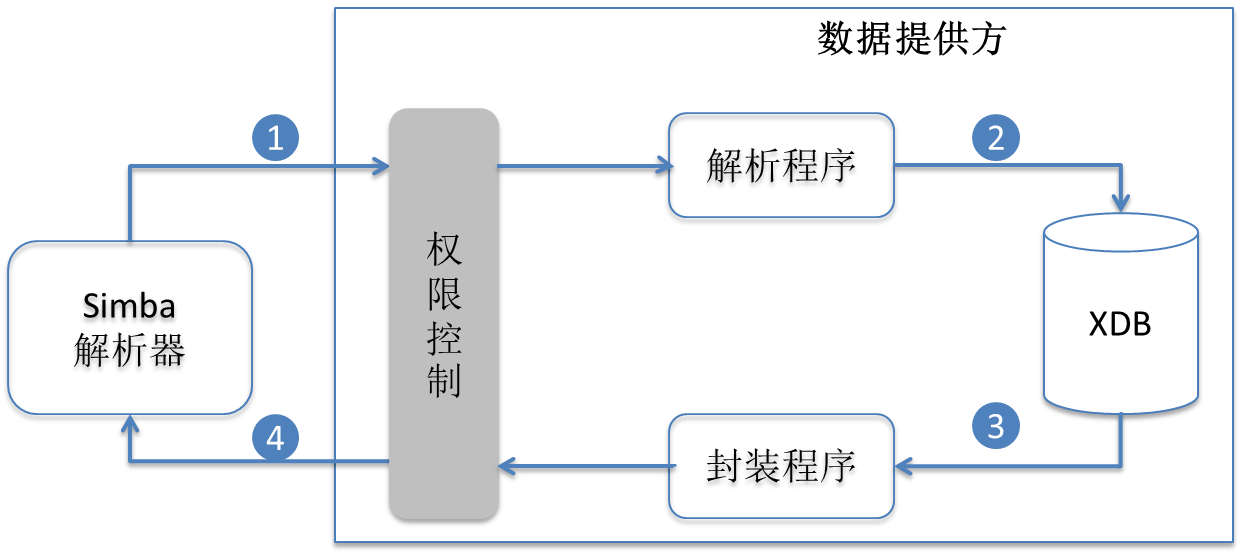


Simba是一种统一图数据库和SQL的数据库语言。Simba支持3种与其他数据库的访问方式，分别为HTTP API（数据提供方）、Thrift、JDBC Driver。本文主要详细介绍HTTP API接口访问方式。

### 数据访问流程

Simba用HTTP API访问其他数据库的流程如下：

1. 解析器进行权限认证后，按HTTP API协议发起数据访问请求；
2. 数据提供方收到请求，按API协议进行接口解析；
3. 数据提供方按要求进行数据操作，并将结果按规范要求进行封装；
4. 数据提供方返回数据查询结果，解析器接收数据进一步处理。



### HTTP API

#### HTTP介绍

1. 使用协议

HTTP 1.1（超文本传输协议）

1. 数据交互方式

GET方式，获取数据列表

POST方式，提交查询请求

PUT方式，批量插入数据

1. 请求参数

Accept：指定客户端能够接受的内容类型，内容类型中的先后顺序表示客户端接受的先后顺序。例如：Accept:text/xml,text/html;

Content-Type：请求的与实体对应的MIME值。例如：Content-Type: text/json, text/text;

1. 查询参数

需在URL中指定查询语言与资源，例如（language=sql）

Get方式时，查询参数编码到URL中

POST、PUT方式时，查询参数封装在请求实体中

1. 返回结果

请求结果将按请求方式进行分装

请求中将包含结果状态码

#### 查询接口定义

1. URL

http://xxxx.abc.com/select?language=simbaql&sql=“select \* from stars”&page\_size=10&index=3 (“可用%22 转义)

1. 功能

获取数据列表

1. 参数

URL参数

指定查询语言language 如 SQL、SimbaQL、SparQL、Gremlin，示例详见章节4、5

查询语句sql，一般select查询语句

分页请求参数，page\_size分页大小，index页码索引

1. Head参数

Accept，接收类型

Content-Type，返回数据类型

1. 实现

接收请求头部，分析URL中访问资源

获取分页参数，按要求获取相应数量资源，如无参数则按照默认方式进行

对获取结果按照Head中参数类型进行封装，同时封装结果状态码

#### 插入接口定义

1. URL

http://xxxx.abc.com/insert

body:{“db”:”database”,”table”:”name”,”data”:[{},...]}

1. 功能

批量插入数据

1. 参数

Head参数

Accept，接收类型

Content-Type，返回数据类型

Body，以JSON格式提交数据

1. 实现

接收请求头部，分析URL中访问资源

解析body中操作及数据，按操作结果返回相应信息

对获取结果按照Head中参数类型进行封装，同时封装结果状态码

#### 删除接口定义

1. URL

http://xxxx.abc.com/delete

body:{“db”:”database”,”table”:”name”,”id”:[{},...]}

1. 功能

批量删除数据

1. 参数

Head参数

Accept，接收类型

Content-Type，返回数据类型

Body，以JSON格式提交数据

1. 实现

接收请求头部，分析URL中访问资源

解析body中操作及数据，按操作结果返回相应信息

对获取结果按照Head中参数类型进行封装，同时封装结果状态码

### SQL&SimbaQL语句

SQL和SimbaQL示例语句如下表所示：

|  |  |  |
| --- | --- | --- |
| # | SQL commands | SimbaQL commands |
| Q1 | select  l\_returnflag, l\_linestatus,  sum(l\_quantity) as sum\_qty,  sum(l\_extendedprice) as sum\_base\_price,  sum(l\_extendedprice\*(1-l\_discount)) as sum\_disc\_price, sum(l\_extendedprice\*(1-l\_discount)**(1+l\_tax)) as sum\_charge,  avg(l\_quantity) as avg\_qty,  avg(l\_extendedprice) as avg\_price,  avg(l\_discount) as avg\_disc,  count(**) as count\_order  from lineitem  where l\_shipdate <= date ‘1998-12-01’ – interval ‘[DELTA]’ day (3)  group by l\_returnflag, l\_linestatus  order by l\_returnflag, l\_linestatus | Select x.l\_returnflag, x.l\_linestatus,  sum(x.l\_quantity) as sum\_qty,  sum(x.l\_extendedprice) as sum\_base\_price,  sum(x.l\_extendedprice\*(1- x.l\_discount)) as sum\_disc\_price, sum(x.l\_extendedprice\*(1- x.l\_discount)**(1+ x.l\_tax)) as sum\_charge,  avg(x.l\_quantity) as avg\_qty,  avg(x.l\_extendedprice) as avg\_price,  avg(x.l\_discount) as avg\_disc,  count(**) as count\_order From lineitem x where x.l\_shipdate <= date (‘1998-12-01’) – interval. day (3) Group by x.l\_returnflag, x.l\_linestatus Order by x.l\_returnflag, x.l\_linestatus |
| Q2 | select  s\_acctbal,  s\_name, n\_name,  p\_partkey, p\_mfgr,  s\_address,  s\_phone,  s\_comment  from part, supplier, partsupp, nation, region  where  p\_partkey = ps\_partkey and  s\_suppkey = ps\_suppke y and  p\_size = [SIZE] and  p\_type like ‘%[TYPE]’ and  s\_nationkey = n\_nationkey and  n\_regionkey = r\_regionkey and  r\_name = ‘[REGION]’ and  ps\_supplycost = (  select min(ps\_supplycost)  from partsupp, supplier, nation, region  where p\_partkey = ps\_partkey and s\_suppkey = ps\_suppkey and s\_nationkey = n\_nationkey and n\_regionkey = r\_regionkey and r\_name = ‘[REGION]’ )  order by s\_acctbal desc, n\_name, s\_name, p\_partkey; | Select s.s\_acctbal,  s.s\_name, n.n\_name,  p.p\_partkey, p.p\_mfgr,  s.s\_address,  s.s\_phone,  s.s\_comment From part p , supplier s, partsupp ps, nation n, region r Where p.p\_partkey = ps .ps\_partkey and  s.s\_suppkey = ps.ps\_suppkey and  p.p\_size = [SIZE] and  p.p\_type like ‘%[TYPE]’ and  s.s\_nationkey = n.n\_nationkey and  n.n\_regionkey = r.r\_regionkey and  r.r\_name = ‘[REGION]’ and  ps.ps\_supplycost = ( Find partsupp ps1, supplier s1, nation n1, region r1 Where p.p\_partkey = ps1.ps\_partkey and s1.s\_suppkey = ps1.ps\_suppkey and s1.s\_nationkey = n1.n\_nationkey and n1.n\_regionkey = r1.r\_regionkey and r1.r\_name = ‘[REGION]’ Return min(ps1.ps\_supplycost)”) Order by s.s\_acctbal desc, n.n\_name, s.s\_name,p. p\_partkey |
| Q3 | Select l\_orderkey, sum(l\_extendedprice\*(1-l\_discount)) as revenue, o\_orderdate,  o\_shippriority From customer, orders, lineitem  where c\_mktsegment = ‘[SEGMENT]’ and  c\_custkey = o\_custkey and l\_orderkey = o\_orderkey and o\_orderdate < date ‘[DATE]’ and  l\_shipdate > date ‘[DATE]’  group by l\_orderkey, o\_orderdate, o\_shippriority  order by revenue desc, o\_orderdate; | Select l.l\_orderkey, sum(l.l\_extendedprice\*(1-l.l\_discount)) as revenue, o.o\_orderdate,  o.o\_shippriority From customer c, orders o, lineitem l Where c.c\_mktsegment = ‘[SEGMENT]’ and  c.c\_custkey = o.o\_custkey and l.l\_orderkey = o.o\_orderkey and o.o\_orderdate < date (‘[DATE]’) and  l.l\_shipdate > date (‘[DATE]’) Group by l.l\_orderkey, o.o\_orderdate, o.o\_shippriority  Order by revenue desc, o.o\_orderdate |
| Q4 | select o\_orderpriority, count(\*) as order\_count  from orders  where o\_orderdate >= date ‘[DATE]’ and  o\_orderdate < date ‘[DATE]’ + interval ‘3’ month and exists ( select \*  from lineitem  where l\_orderkey = o\_orderkey and l\_commitdate < l\_receiptdate  )  group by o\_orderpriority  order by o\_orderpriority; | Select o.o\_orderpriority, count(\*) as order\_count From orders o Where o.o\_orderdate >= date (‘[DATE]’) and  o.o\_orderdate < date (‘[DATE]’) + interval.month(3) and exists ( select \*  from lineitem l  Where l.l\_orderkey = o.o\_orderkey and l.l\_commitdate < l.l\_receiptdate )  group by o.o\_orderpriority  order by o.o\_orderpriority |
| Q5 | Select n\_name,  sum(l\_extendedprice \* (1 – l\_discount)) as revenue From customer, orders, lineitem, supplier, nation, region  where c\_custkey = o\_custkey and  l\_orderkey = o\_orderkey and l\_suppkey = s\_suppkey and  c\_nationkey = s\_nationkey and  s\_nationkey = n\_nationkey and  n\_regionkey = r\_regionkey and  r\_name = ‘[REGION]’ and  o\_orderdate >= date ‘[DATE]’ and  o\_orderdate < date ‘[DATE]’ + interval ‘1’ year  group by n\_name  order by revenue desc; | Select n.n\_name, sum(l.l\_extendedprice \* (1 –l. l\_discount)) as revenue Find customer c, orders o, lineitem l, supplier s, nation n, region r where c.c\_custkey = o.o\_custkey and  l.l\_orderkey = o.o\_orderkey and l.l\_suppkey = s.s\_suppkey and  c.c\_nationkey = s.s\_nationkey and  s.s\_nationkey = n.n\_nationkey and  n.n\_regionkey = r.r\_regionkey and  r.r\_name = ‘[REGION]’ and  o.o\_orderdate >= date(‘[DATE]’) and  o.o\_orderdate < date(‘[DATE]’) + interval.year(1)  group by n.n\_name  order by revenue desc |
| Q6 | select sum(l\_extendedprice\*l\_discount) as revenue  from lineitem where l\_shipdate >= date ‘[DATE]’ and l\_shipdate < date ‘[DATE]’ + interval ‘1’ year and l\_discount between [DISCOUNT] – 0.01 and [DISCOUNT] + 0.01 and l\_quantity < [QUANTITY]; | Select sum(l.l\_extendedprice\*l.l\_discount) as revenue From lineitem l where l.l\_shipdate >= date(‘[DATE]’) and l.l\_shipdate < date(‘[DATE]’) + interval.year(1) and l.l\_discount.between ([DISCOUNT] – 0.01, [DISCOUNT] + 0.01) and l.l\_quantity < [QUANTITY] |
| Q7 | select supp\_nation,  cust\_nation,  l\_year, sum(volume) as revenue from (  select n1.n\_name as supp\_nation,  n2.n\_name as cust\_nation,  extract(year from l\_shipdate) as l\_year,  l\_extendedprice \* (1 – l\_discount) as volume  from supplier, lineitem, orders, customer, nation n1, nation n2 where s\_suppkey = l\_suppkey and o\_orderkey = l\_orderkey and c\_custkey = o\_custkey and  s\_nationkey = n1.n\_nationkey and c\_nationkey = n2.n\_nationkey and ( (n1.n\_name = ‘[NATION1]’ and n2.n\_name = ‘[NATION2]’) or (n1.n\_name = ‘[NATION2]’ and n2.n\_name = ‘[NATION1]’) ) and l\_shipdate between date ‘1995-01-01’ and date ‘1996-12-31’  ) as shipping  group by supp\_nation, cust\_nation, l\_year  order by supp\_nation, cust\_nation, l\_year; | Select shipping .supp\_nation,  shipping .cust\_nation,  shipping .l\_year,  sum(shipping .volume) as revenue From (  Select n1.n\_name as supp\_nation,  n2.n\_name as cust\_nation,  extract(‘year’, l.l\_shipdate) as l\_year,  l.l\_extendedprice \* (1 – l.l\_discount) as volume From supplier s, lineitem l,  orders o, customer c, nation n1, nation n2 where s.s\_suppkey = l.l\_suppkey and o.o\_orderkey = l.l\_orderkey and c.c\_custkey = o.o\_custkey and  s.s\_nationkey = n1.n\_nationkey and c.c\_nationkey = n2.n\_nationkey and ( (n1.n\_name = ‘[NATION1]’ and n2.n\_name = ‘[NATION2]’) or (n1.n\_name = ‘[NATION2]’ and n2.n\_name = ‘[NATION1]’) ) and l.l\_shipdate.between(date(‘1995-01-01’) ,date(‘1996-12-31’))  ) shipping Group by shipping .supp\_nation, shipping .cust\_nation, shipping .l\_year  Order by shipping .supp\_nation, shipping .cust\_nation, shipping .l\_year |
| Q8 | select o\_year,  sum(case when nation = ‘[NATION]’ then volume else 0 end) / sum(volume) as mkt\_share  from (  select extract(year from o\_orderdate) as o\_year,  l\_extendedprice \* (1-l\_discount) as volume,  n2.n\_name as nation from part, supplier, lineitem, orders, customer, nation n1, nation n2, region where p\_partkey = l\_partkey and s\_suppkey = l\_suppkey and l\_orderkey = o\_orderkey and o\_custkey = c\_custkey and c\_nationkey = n1.n\_nationkey and n1.n\_regionkey = r\_regionkey and r\_name = ‘[REGION]’ and  s\_nationkey = n2.n\_nationkey and o\_orderdate between date ‘1995-01-01’ and date ‘1996-12-31’ and p\_type = ‘[TYPE]’  ) as all\_nations  group by o\_year  order by o\_year; | Select all\_nations .o\_year,  sum(case when all\_nations.nation = ‘[NATION]’ then all\_nations.volume else 0 end) / sum(all\_nations .volume) as mkt\_share From (  Select extract(‘year’ , o.o\_orderdate) as o\_year,  l.l\_extendedprice \* (1-l.l\_discount) as volume,  n2.n\_name as nation From part p, supplier s, lineitem l, orders o, customer c, nation n1,  nation n2, region r  where p.p\_partkey = l.l\_partkey and s.s\_suppkey = l.l\_suppkey and l.l\_orderkey = o.o\_orderkey and o.o\_custkey = c.c\_custkey and c.c\_nationkey = n1.n\_nationkey and n1.n\_regionkey = r.r\_regionkey and r.r\_name = ‘[REGION]’ and  s.s\_nationkey = n2.n\_nationkey and o.o\_orderdate.between(date(‘1995-01-01’) , date(‘1996-12-31’)) and p.p\_type = ‘[TYPE]’ ) all\_nations  group by all\_nations .o\_year  order by all\_nations .o\_year |
| Q9 | select nation, o\_year, sum(amount) as sum\_profit  from (  select n\_name as nation, extract(year from o\_orderdate) as o\_year, l\_extendedprice \* (1 – l\_discount) – ps\_supplycost \* l\_quantity as amount from part, supplier, lineitem, partsupp, orders, nation  where s\_suppkey = l\_suppkey and ps\_suppkey = l\_suppkey and  ps\_partkey = l\_partkey and  p\_partkey = l\_partkey and  o\_orderkey = l\_orderkey and  s\_nationkey = n\_nationkey and  p\_name like ‘[COLOR]’  ) as profit group by nation, o\_year  order by nation, o\_year desc; | Select profit.nation, profit.o\_year, sum(profit.amount) as sum\_profit From (  Select n.n\_name as nation,  extract(‘year’ ,o.o\_orderdate) as o\_year,  l.l\_extendedprice \* (1 – l.l\_discount) – ps.ps\_supplycost \* l.l\_quantity as amount From part p, supplier s, lineitem l, partsupp ps, orders o, nation n  where s.s\_suppkey = l.l\_suppkey and ps.ps\_suppkey = l.l\_suppkey and  ps.ps\_partkey = l.l\_partkey and  p.p\_partkey = l.l\_partkey and  o.o\_orderkey = l.l\_orderkey and  s.s\_nationkey = n.n\_nationkey and  p.p\_name like ‘[COLOR]’ ) profit group by profit.nation, profit.o\_year  order by profit.nation, profit.o\_year desc |
| Q10 | select c\_custkey, c\_name,  sum(l\_extendedprice \* (1 – l\_discount)) as revenue,  c\_acctbal, n\_name, c\_address, c\_phone, c\_comment  from customer, orders, lineitem, nation  where c\_custkey = o\_custkey and l\_orderkey = o\_orderkey and  o\_orderdate >= date ‘[DATE]’ and  o\_orderdate < date ‘[DATE]’ + interval ‘3’ month and l\_returnflag = ‘R’ and  c\_nationkey = n\_nationkey  group by c\_custkey, c\_name, c\_acctbal, c\_phone, n\_name, c\_address, c\_comment order by revenue desc; | Select c.c\_custkey, c.c\_name,  sum(l.l\_extendedprice \* (1 – l.l\_discount)) as revenue,  c.c\_acctbal, n.n\_name, c.c\_address, c.c\_phone, c.c\_comment  From customer c, orders o, lineitem l, nation n  where c.c\_custkey = o.o\_custkey and l.l\_orderkey = o.o\_orderkey and  o.o\_orderdate >= date(‘[DATE]’) and  o.o\_orderdate < date(‘[DATE]’) + interval.month(3) and l.l\_returnflag = ‘R’ and  c.c\_nationkey = n.n\_nationkey  group by c.c\_custkey, c.c\_name, c.c\_acctbal, c.c\_phone,  n.n\_name, c.c\_address, c.c\_comment  order by revenue desc |
| Q11 | select ps\_partkey, sum(ps\_supplycost \* ps\_availqty) as value  from partsupp, supplier, nation  where ps\_suppkey = s\_suppkey and s\_nationkey = n\_nationkey and  n\_name = ‘[NATION]’  group by ps\_partkey having sum(ps\_supplycost \* ps\_availqty) > (  select sum(ps\_supplycost \* ps\_availqty) \* [FRACTION]  from partsupp, supplier, nation  where ps\_suppkey = s\_suppkey and  s\_nationkey = n\_nationkey and  n\_name = ‘[NATION]’ )  order by value desc; | Select ps.ps\_partkey, sum(ps.ps\_supplycost \* ps.ps\_availqty) as value From partsupp ps, supplier s, nation n where ps.ps\_suppkey = s.s\_suppkey and s.s\_nationkey = n.n\_nationkey and  n.n\_name = ‘[NATION]’  group by ps.ps\_partkey having  sum(ps.ps\_supplycost \* ps.ps\_availqty) > (  Select sum(ps1.ps\_supplycost \* ps1.ps\_availqty) \* [FRACTION] From partsupp ps1, supplier s1, nation n1 where ps1.ps\_suppkey = s1.s\_suppkey and  s1.s\_nationkey = n1.n\_nationkey and  n1.n\_name = ‘[NATION]’ ) order by value desc |
| Q12 | select l\_shipmode,  sum(case when o\_orderpriority =‘1-URGENT’ or o\_orderpriority =‘2-HIGH’ then 1 else 0 end) as high\_line\_count,  sum(case when o\_orderpriority <> ‘1-URGENT’ and o\_orderpriority <> ‘2-HIGH’ then 1 else 0 end) as low\_line\_count  from orders, lineitem  where o\_orderkey = l\_orderkey and  l\_shipmode in (‘[SHIPMODE1]’, ‘[SHIPMODE2]’) and l\_commitdate < l\_receiptdate and  l\_shipdate < l\_commitdate and  l\_receiptdate >= date ‘[DATE]’ and  l\_receiptdate < date ‘[DATE]’ + interval ‘1’ year  group by l\_shipmode  order by l\_shipmode; | Select l.l\_shipmode,  sum(case when o.o\_orderpriority =‘1-URGENT’ or o.o\_orderpriority =‘2-HIGH’ then 1 else 0 end) as high\_line\_count,  sum(case when o.o\_orderpriority <> ‘1-URGENT’ and o.o\_orderpriority <> ‘2-HIGH’ then 1 else 0 end) as low\_line\_count From orders o, lineitem l where o.o\_orderkey = l.l\_orderkey and  l.l\_shipmode in (‘[SHIPMODE1]’, ‘[SHIPMODE2]’) and l.l\_commitdate < l\_receiptdate and  l.l\_shipdate < l\_commitdate and  l.l\_receiptdate >= date(‘[DATE]’) and  l.l\_receiptdate < date(‘[DATE]’) + interval.year(1)  group by l.l\_shipmode  order by l.l\_shipmode |
| Q13 | select c\_count, count(\*) as custdist  from (  select c\_custkey, count(o\_orderkey)  from customer left outer join orders  on c\_custkey = o\_custkey and o\_comment not like ‘%[WORD1]%[WORD2]%’ group by c\_custkey  )as c\_orders (c\_custkey, c\_count)  group by c\_count  order by custdist desc, c\_count desc; | Select c\_orders.c\_count, count(\*) as custdist From (  Select c.c\_custkey, count(o.o\_orderkey) as c\_count From customer c, orders o Where c.c\_custkey = o.o\_custkey and  o.o\_comment not like ‘%[WORD1]%[WORD2]%’ group by c.c\_custkey  ) c\_orders group by c\_orders.c\_count  order by custdist desc, c\_orders.c\_count desc |
| Q14 | select 100.00 \* sum(case when p\_type like ‘PROMO%’ then l\_extendedprice\*(1-l\_discount) else 0 end) / sum(l\_extendedprice \* (1 – l\_discount)) as promo\_revenue  from lineitem, part  where l\_partkey = p\_partkey and l\_shipdate >= date ‘[DATE]’ and l\_shipdate < date ‘[DATE]’ + interval ‘1’ month; | Select 100.00 \* sum(case when p.p\_type like ‘PROMO%’ then l.l\_extendedprice\*(1-l.l\_discount) else 0 end) / sum(l.l\_extendedprice \* (1 – l.l\_discount)) as promo\_revenue  From lineitem l, part p where l.l\_partkey = p.p\_partkey and  l.l\_shipdate >= date(‘[DATE]’) and  l.l\_shipdate < date(‘[DATE]’) + interval.month(1); |
| Q15 | create view revenue[STREAM\_ID] (supplier\_no, total\_revenue) as  select l\_suppkey, sum(l\_extendedprice \* (1 – l\_discount))  from lineitem  where l\_shipdate >= date ‘[DATE]’ and  l\_shipdate < date ‘[DATE]’ + interval ‘3’ month group by l\_suppkey; select s\_suppkey, s\_name, s\_address, s\_phone, total\_revenue  from supplier, revenue[STREAM\_ID]  where s\_suppkey = supplier\_no and total\_revenue = (  select max(total\_revenue)  from revenue[STREAM\_ID] )  order by s\_suppkey;  drop view revenue[STREAM\_ID]; |  |
| Q16 | select p\_brand, p\_type, p\_size, count(distinct ps\_suppkey) as supplier\_cnt  from partsupp, part  where p\_partkey = ps\_partkey and  p\_brand <> ‘[BRAND]’ and  p\_type not like ‘[TYPE]%’ and  p\_size in ([SIZE1], [SIZE2], [SIZE3], [SIZE4], [SIZE5], [SIZE6], [SIZE7], [SIZE8]) and  ps\_suppkey not in (  select s\_suppkey  from supplier  where s\_comment like ‘Customer%Complaints’ ) group by p\_brand, p\_type, p\_size  order by supplier\_cnt desc, p\_brand, p\_type, p\_size; | Select p.p\_brand, p.p\_type, p.p\_size, count(distinct ps.ps\_suppkey) as supplier\_cnt From partsupp ps, part p  where p.p\_partkey = ps.ps\_partkey and  p.p\_brand <> ‘[BRAND]’ and  p.p\_type not like ‘[TYPE]%’ and  p.p\_size in ([SIZE1], [SIZE2], [SIZE3], [SIZE4], [SIZE5], [SIZE6], [SIZE7], [SIZE8]) and  ps.ps\_suppkey not in (  select s.s\_suppkey  from supplier s where s.s\_comment like ‘Customer%Complaints’ ) group by p.p\_brand, p.p\_type, p.p\_size  order by supplier\_cnt desc, p.p\_brand, p.p\_type, p.p\_size |
| Q17 | select sum(l\_extendedprice) / 7.0 as avg\_yearly  from lineitem, part  where p\_partkey = l\_partkey and  p\_brand = ‘[BRAND]’ and  p\_container = ‘[CONTAINER]’ and  l\_quantity < (  select 0.2 \* avg(l\_quantity)  from lineitem  where l\_partkey = p\_partkey ); | Select sum(l.l\_extendedprice) / 7.0 as avg\_yearly From lineitem l, part p where p.p\_partkey = l.l\_partkey and  p.p\_brand = ‘[BRAND]’ and  p.p\_container = ‘[CONTAINER]’ and  l.l\_quantity < (  Select 0.2 \* avg(l1.l\_quantity) From lineitem l1  Where l1.l\_partkey = p.p\_partkey ) |
| Q18 | select c\_name, c\_custkey, o\_orderkey, o\_orderdate, o\_totalprice, sum(l\_quantity) from customer, orders, lineitem  where o\_orderkey in ( select l\_orderkey  from lineitem  group by l\_orderkey having sum(l\_quantity) > [QUANTITY] ) and  c\_custkey = o\_custkey and  o\_orderkey = l\_orderkey  group by c\_name, c\_custkey, o\_orderkey, o\_orderdate, o\_totalprice  order by o\_totalprice desc, o\_orderdate; | Select c.c\_name, c.c\_custkey, o.o\_orderkey, o.o\_orderdate, o.o\_totalprice, sum(l.l\_quantity) From customer c, orders o, lineitem l where o.o\_orderkey in ( Select l1.l\_orderkey From lineitem l1 group by l1.l\_orderkey having sum(l1.l\_quantity) > [QUANTITY] ) and  c.c\_custkey = o.o\_custkey and  o.o\_orderkey = l.l\_orderkey  group by c.c\_name, c.c\_custkey, o.o\_orderkey, o.o\_orderdate, o.o\_totalprice  order by o.o\_totalprice desc, o.o\_orderdate |
| Q19 | select sum(l\_extendedprice \* (1 – l\_discount) ) as revenue  from lineitem, part where ( p\_partkey = l\_partkey and  p\_brand = ‘[BRAND1]’ and  p\_container in ( ‘SM CASE’, ‘SM BOX’, ‘SM PACK’, ‘SM PKG’) and l\_quantity >= [QUANTITY1] and  l\_quantity <= [QUANTITY1] + 10 and  p\_size between 1 and 5 and  l\_shipmode in (‘AIR’, ‘AIR REG’) and  l\_shipinstruct = ‘DELIVER IN PERSON’ ) or  ( p\_partkey = l\_partkey and  p\_brand = ‘[BRAND2]’ and  p\_container in (‘MED BAG’, ‘MED BOX’, ‘MED PKG’, ‘MED PACK’) and l\_quantity >= [QUANTITY2] and  l\_quantity <= [QUANTITY2] + 10 and  p\_size between 1 and 10 and  l\_shipmode in (‘AIR’, ‘AIR REG’) and  l\_shipinstruct = ‘DELIVER IN PERSON’  ) or ( p\_partkey = l\_partkey and  p\_brand = ‘[BRAND3]’ and  p\_container in ( ‘LG CASE’, ‘LG BOX’, ‘LG PACK’, ‘LG PKG’) and  l\_quantity >= [QUANTITY3] and  l\_quantity <= [QUANTITY3] + 10 and  p\_size between 1 and 15 and  l\_shipmode in (‘AIR’, ‘AIR REG’) and  l\_shipinstruct = ‘DELIVER IN PERSON’ ); | Select sum(l.l\_extendedprice \* (1 – l.l\_discount) ) as revenue From lineitem l, part p where ( p.p\_partkey = l.l\_partkey and  p.p\_brand = ‘[BRAND1]’ and  p.p\_container in ( ‘SM CASE’, ‘SM BOX’, ‘SM PACK’, ‘SM PKG’) and l.l\_quantity >= [QUANTITY1] and  l.l\_quantity <= [QUANTITY1] + 10 and  p.p\_size between 1 and 5 and  l.l\_shipmode in (‘AIR’, ‘AIR REG’) and  l.l\_shipinstruct = ‘DELIVER IN PERSON’ ) or  ( p.p\_partkey = l.l\_partkey and  p.p\_brand = ‘[BRAND2]’ and  p.p\_container in (‘MED BAG’, ‘MED BOX’, ‘MED PKG’, ‘MED PACK’) and l.l\_quantity >= [QUANTITY2] and  l.l\_quantity <= [QUANTITY2] + 10 and  p.p\_size between 1 and 10 and  l.l\_shipmode in (‘AIR’, ‘AIR REG’) and  l.l\_shipinstruct = ‘DELIVER IN PERSON’  ) or ( p.p\_partkey = l.l\_partkey and  p.p\_brand = ‘[BRAND3]’ and  p.p\_container in ( ‘LG CASE’, ‘LG BOX’, ‘LG PACK’, ‘LG PKG’) and  l.l\_quantity >= [QUANTITY3] and  l.l\_quantity <= [QUANTITY3] + 10 and  p.p\_size between 1 and 15 and  l.l\_shipmode in (‘AIR’, ‘AIR REG’) and  l.l\_shipinstruct = ‘DELIVER IN PERSON’ ) |
| Q20 | select s\_name, s\_address  from supplier, nation  where s\_suppkey in (  select ps\_suppkey  from partsupp  where ps\_partkey in (  select p\_partkey  from part  where p\_name like ‘[COLOR]%’ ) and  ps\_availqty > (  select 0.5 \* sum(l\_quantity)  from lineitem  where l\_partkey = ps\_partkey and  l\_suppkey = ps\_suppkey and  l\_shipdate >= date(‘[DATE]’) and  l\_shipdate < date(’[DATE]’) + interval ‘1’ year ) ) and  s\_nationkey = n\_nationkey and  n\_name = ‘[NATION]’  order by s\_name; | Select s.s\_name, s.s\_address From supplier s, nation n where s.s\_suppkey in (  Select ps.ps\_suppkey From partsupp ps where ps.ps\_partkey in ( Select p.p\_partkey From part p where p.p\_name like ‘[COLOR]%’ ) and  ps.ps\_availqty > (  Select 0.5 \* sum(l.l\_quantity) From lineitem l where l.l\_partkey = ps.ps\_partkey and  l.l\_suppkey = ps.ps\_suppkey and  l.l\_shipdate >= date(‘[DATE]’) and  l.l\_shipdate < date(’[DATE]’) + interval.year(1) ) ) and  s.s\_nationkey = n.n\_nationkey and  n.n\_name = ‘[NATION]’ order by s.s\_name; |
| Q21 | select s\_name, count(\*) as numwait  from supplier, lineitem l1, orders, nation  where s\_suppkey = l1.l\_suppkey and  o\_orderkey = l1.l\_orderkey and  o\_orderstatus = ‘F’ and  l1.l\_receiptdate > l1.l\_commitdate and  exists ( select \*  from lineitem l2  where l2.l\_orderkey = l1.l\_orderkey and  l2.l\_suppkey <> l1.l\_suppkey ) and  not exists ( select \*  from lineitem l3  where l3.l\_orderkey = l1.l\_orderkey and  l3.l\_suppkey <> l1.l\_suppkey and  l3.l\_receiptdate > l3.l\_commitdate ) and  s\_nationkey = n\_nationkey and  n\_name = ‘[NATION]’  group by s\_name  order by numwait desc, s\_name; | Select s.s\_name, count(\*) as numwait From supplier s, lineitem l1, orders o, nation n where s.s\_suppkey = l1.l\_suppkey and  o.o\_orderkey = l1.l\_orderkey and  o\_orderstatus = ‘F’ and  l1.l\_receiptdate > l1.l\_commitdate and  exists (  Select \* From lineitem l2 where l2.l\_orderkey = l1.l\_orderkey and  l2.l\_suppkey <> l1.l\_suppkey ) and  not exists (  Select \* From lineitem l3 where l3.l\_orderkey = l1.l\_orderkey and  l3.l\_suppkey <> l1.l\_suppkey and  l3.l\_receiptdate > l3.l\_commitdate) and  s.s\_nationkey = n.n\_nationkey and  n.n\_name = ‘[NATION]’  group by s.s\_name  order by numwait desc, s\_name |
| Q22 | select cntrycode, count(\*) as numcust, sum(c\_acctbal) as totacctbal  from (  select substring(c\_phone from 1 for 2) as cntrycode, c\_acctbal  from customer  where substring(c\_phone from 1 for 2) in (‘[I1]’,‘[I2]’,’[I3]‘,’[I4]‘,’[I5]‘,’[I6]‘,’[I7]‘) and  c\_acctbal > (  select avg(c\_acctbal)  from customer  where c\_acctbal > 0.00 and  substring (c\_phone from 1 for 2) in (’[I1]‘,’[I2]‘,’[I3]‘,’[I4]‘,’[I5]‘,’[I6]‘,’[I7]’) ) and  not exists (  select \*  from orders  where o\_custkey = c\_custkey ) ) as custsale  group by cntrycode  order by cntrycode; | Select custsale.cntrycode, count(\*) as numcust,  sum(custsale.c\_acctbal) as totacctbal From (  Select substring(c.c\_phone ,1 , 2) as cntrycode, c.c\_acctbal From customer c where substring(c.c\_phone ,1 , 2) in(‘[I1]’,‘[I2]’,’[I3]‘,’[I4]‘,’[I5]‘,’[I6]‘,’[I7]‘)  and  c.c\_acctbal > (  Select avg(c1.c\_acctbal) From customer c1 where c1.c\_acctbal > 0.00 and  substring (c1.c\_phone,1 , 2) in (’[I1]‘,’[I2]‘,’[I3]‘,’[I4]‘,’[I5]‘,’[I6]‘,’[I7]’)) and  not exists (  Select \* From orders o where o.o\_custkey = c.c\_custkey) ) custsale  group by custsale.cntrycode  order by custsale.cntrycode |

### SparQL&Gremlin语句

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| --- | --- | --- |
| # | SparQL commands | Gremlin commands |
| Q1 | select ?taxonId from <http://data.wdcm.org.v1/>where {?nameId <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/taxname> 'Bifidobacterium adolescentis'. ?nameId <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/taxid> ?taxonId}limit 1 | g.V().hasLabel("literal").has("lid", "Bifidobacterium adolescentis").inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/taxname").outV().outE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/taxid").outV().values("vid") |
| Q2 | select ?name ?parentId from <http://data.wdcm.org.v1/>where {<http://gcm.wdcm.org/data/gcmAnnotation1/taxonomy/1680> <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/parentTaxid> ?parentId.?nameId <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/taxid> ?parentId;<http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/nameclass> 'scientificName'; <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/taxname> ?name.}limit 1 | g.V().hasLabel("taxonomy").has("vid", "http://gcm.wdcm.org/data/gcmAnnotation1/taxonomy/1680").match(\_\_.as("a").outE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/parentTaxid").inV().as("parent"), \_\_.as("parent").inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/taxid").outV().as("nameid"), \_\_.as("nameid").outE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/nameclass").inV().has("lid", "scientificName"), \_\_.as("nameid").outE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/taxname").inV().as("name")).select("name").values("lid").as("lname").select("parent").values("vid").as("lparent").select("lname", "lparent") |
| Q3 | SELECT ?taxonId ?name from <http://data.wdcm.org.v1/> where { ?taxonId <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/parentTaxid> <http://gcm.wdcm.org/data/gcmAnnotation1/taxonomy/1680>.?nameId <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/taxid> ?taxonId;<http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/nameclass> 'scientificName';<http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/taxname> ?name}ORDER BY ASC[?name] | g.V().hasLabel("taxonomy").has("vid", "http://gcm.wdcm.org/data/gcmAnnotation1/taxonomy/1680").inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/parentTaxid").outV().match(\_\_.as("taxon").inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/taxid").outV().as("nameid"), \_\_.as("nameid").outE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/nameclass").inV().has("lid", "scientificName"), \_\_.as("nameid").outE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/taxname").inV().as("name")).select("taxon").values("vid").as("ltaxonid").select("name").values("lid").as("lname").select("ltaxonid", "lname") |
| Q4 | SELECT (count(DISTINCT ?pdbid) as ?num) from <http://data.wdcm.org.v1/> where {?taxonid <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ancestorTaxid> <http://gcm.wdcm.org/data/gcmAnnotation1/taxonomy/1680>.{?proteinid a <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ProteinNode>;<http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-taxon> ?taxonid;<http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-pdb> ?pdbid.}union{?proteinid a <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ProteinNode>;<http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-taxon> <http://gcm.wdcm.org/data/gcmAnnotation1/taxonomy/1680>;<http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-pdb> ?pdbid.}} | g.V().has("vid", "http://gcm.wdcm.org/data/gcmAnnotation1/taxonomy/1680").union(\_\_.as("isc").match(\_\_.as("a").inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ancestorTaxid").outV().inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-taxon").outV().has("xtype", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ProteinNode").as("protein1"), \_\_.as("protein1").outE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-pdb").inV().as("pdb1")).select("pdb1"), \_\_.as("isc").match(\_\_.as("a").inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-taxon").outV().has("xtype", |
| Q5 | SELECT (count(DISTINCT ?pfam) as ?num) from <http://data.wdcm.org.v1/> where {?taxonid <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ancestorTaxid> <http://gcm.wdcm.org/data/gcmAnnotation1/taxonomy/1680>.{?proteinid a <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ProteinNode>;<http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-taxon> ?taxonid;<http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-pfam> ?pfam.}union{?proteinid a <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ProteinNode>;<http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-taxon> <http://gcm.wdcm.org/data/gcmAnnotation1/taxonomy/1680>;<http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-pfam> ?pfam.}} | g.V().has("vid", "http://gcm.wdcm.org/data/gcmAnnotation1/taxonomy/1680").union(\_\_.as("isc").match(\_\_.as("a").inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ancestorTaxid").outV().inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-taxon").outV().has("xtype", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ProteinNode").as("protein1"), \_\_.as("protein1").outE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-pfam").inV().as("pfam1")).select("pfam1"), match(\_\_.as("a").inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-taxon").outV().has("xtype", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ProteinNode").as("protein2"), \_\_.as("protein2").outE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-pfam").inV().as("pfam2")).select("pfam2")).count() |
| Q6 | SELECT(count(DISTINCT ?goid) as ?num) from <http://data.wdcm.org.v1/> where {?taxonid <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ancestorTaxid> <http://gcm.wdcm.org/data/gcmAnnotation1/taxonomy/1680>.{?proteinid a <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ProteinNode>;<http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-taxon> ?taxonid;<http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-go> ?goid.}union{?proteinid a <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ProteinNode>;<http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-taxon> <http://gcm.wdcm.org/data/gcmAnnotation1/taxonomy/1680>;<http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-go> ?goid.}} | g.V().has("vid", "http://gcm.wdcm.org/data/gcmAnnotation1/taxonomy/1680").union(\_\_.as("isc").match(\_\_.as("a").inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ancestorTaxid").outV().inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-taxon").outV().has("xtype", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ProteinNode").as("protein1"), \_\_.as("protein1").outE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-go").inV().as("go1")).select("go1"), \_\_.as("isc").match(\_\_.as("a").inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-taxon").outV().has("xtype", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ProteinNode").as("protein2"), \_\_.as("protein2").outE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-go").inV().as("go2")).select("go2")).dedup().count() |
| Q7 | SELECT (count(DISTINCT ?pathid) as ?num) from <http://data.wdcm.org.v1/> where {?taxonid <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ancestorTaxid> <http://gcm.wdcm.org/data/gcmAnnotation1/taxonomy/1680>.{?gene a <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/GeneNode>;<http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-taxon> ?taxonid.?pathid a <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/PathwayNode>;<http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-gene> ?gene.}union{?gene a <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/GeneNode>;<http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-taxon> <http://gcm.wdcm.org/data/gcmAnnotation1/taxonomy/1680>.?pathid a <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/PathwayNode>;<http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-gene> ?gene.}} | g.V().has("vid", "http://gcm.wdcm.org/data/gcmAnnotation1/taxonomy/1680").union(\_\_.as("isc").match(\_\_.as("a").inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ancestorTaxid").outV().inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-taxon").outV().has("xtype", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/GeneNode").as("gene1"), \_\_.as("gene1").inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-gene").outV().has("xtype", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/PathwayNode").as("pathid1")).select("pathid1"), \_\_.as("isc").match(\_\_.as("a").inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-taxon").outV().has("xtype", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/GeneNode").as("gene2"), \_\_.as("gene2").inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-gene").outV().has("xtype", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/PathwayNode").as("pathid2")).select("pathid2")).count() |
| Q8 | SELECT (count(DISTINCT ?enzymeId) as ?num) from <http://data.wdcm.org.v1/> where {?taxonid <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ancestorTaxid> <http://gcm.wdcm.org/data/gcmAnnotation1/taxonomy/1680>.{?gene a <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/GeneNode>;<http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-taxon> ?taxonid.?enzymeId a <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/EnzymeNode>;<http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-gene> ?gene.}union{?gene a <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/GeneNode>;<http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-taxon> <http://gcm.wdcm.org/data/gcmAnnotation1/taxonomy/1680>.?enzymeId a <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/EnzymeNode>;<http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-gene> ?gene.}} | g.V().has("vid", "http://gcm.wdcm.org/data/gcmAnnotation1/taxonomy/1680").union(\_\_.as("isc").match(\_\_.as("a").inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ancestorTaxid").outV().inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-taxon").outV().has("xtype", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/GeneNode").as("gene1"), \_\_.as("gene1").inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-gene").outV().has("xtype", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/EnzymeNode").as("enzyme1")).select("enzyme2"), \_\_.as("isc").match(\_\_.as("a").inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-taxon").outV().has("xtype", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/GeneNode").as("gene2"), \_\_.as("gene2").inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-gene").outV().has("xtype", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/EnzymeNode").as("enzyme2")).select("enzyme2")).count() |
| Q9 | SELECT (count(DISTINCT ?geneid) as ?num) from <http://data.wdcm.org.v1/> where {?taxonid <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ancestorTaxid> <http://gcm.wdcm.org/data/gcmAnnotation1/taxonomy/1680>.{?geneid a <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/GeneNode>;<http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-taxon> ?taxonid.}union{?geneid a <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/GeneNode>;<http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-taxon> <http://gcm.wdcm.org/data/gcmAnnotation1/taxonomy/1680>.}} | g.V().has("vid", "http://gcm.wdcm.org/data/gcmAnnotation1/taxonomy/1680").union(\_\_.as("isc").match(\_\_.as("a").inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ancestorTaxid").outV().inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-taxon").outV().has("xtype", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/GeneNode").as("gene1")).select("gene1"), \_\_.as("isc").match(\_\_.as("a").inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-taxon").outV().has("xtype", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/GeneNode").as("gene2")).select("gene2")).dedup().count() |
| Q10 | SELECT (count(DISTINCT ?proteinid) as ?num) from <http://data.wdcm.org.v1/> where {?taxonid <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ancestorTaxid> <http://gcm.wdcm.org/data/gcmAnnotation1/taxonomy/1680>.{?proteinid a <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ProteinNode>;<http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-taxon> ?taxonid.}union{?proteinid a <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ProteinNode>;<http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-taxon> <http://gcm.wdcm.org/data/gcmAnnotation1/taxonomy/1680>.}} | g.V().has("vid", "http://gcm.wdcm.org/data/gcmAnnotation1/taxonomy/1680").union(\_\_.as("isc").match(\_\_.as("a").inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ancestorTaxid").outV().inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-taxon").outV().has("xtype", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ProteinNode").as("protein1")).select("protein1"), match(\_\_.as("a").inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-taxon").outV().has("xtype", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ProteinNode").as("protein2")).select("protein2")).count() |
| Q11 | SELECT (count(?name) as ?num) from <http://data.wdcm.org.v1/> where {?taxonid <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ancestorTaxid> <http://gcm.wdcm.org/data/gcmAnnotation1/taxonomy/1680>.?nameId <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/taxid> ?taxonid;<http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/nameclass> 'scientificName';<http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/taxname> ?name.} | g.V().has("vid", "http://gcm.wdcm.org/data/gcmAnnotation1/taxonomy/1680").inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ancestorTaxid").outV().inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/taxid").outV().union(\_\_.as("isc").match(\_\_.as("nameid").outE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/nameclass").inV().has("lid", "scientificName"), \_\_.as("nameid").outE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/taxname").inV().as("name")).select("name")).count() |
| Q12 | SELECT ?taxonid ?name ?rank from <http://data.wdcm.org.v1/> where {?taxonid <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ancestorTaxid> <http://gcm.wdcm.org/data/gcmAnnotation1/taxonomy/1680>.?nameId <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/taxid> ?taxonid;<http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/nameclass> 'scientificName';<http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/taxname> ?name. ?taxonid <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/nodeRank> ?rank.} OFFSET 0 Limit 15 | g.V().has("vid", "http://gcm.wdcm.org/data/gcmAnnotation1/taxonomy/1680").inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ancestorTaxid").outV().union(\_\_.as("isc").match(\_\_.as("taxonid").inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/taxid").outV().as("nameid"), \_\_.as("nameid").outE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/nameclass").inV().has("lid", "scientificName"), \_\_.as("nameid").outE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/taxname").inV().as("name"), \_\_.as("taxonid").outE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/nodeRank").inV().as("rank")).select("taxonid").values("vid").as("ltaxonid").select("name").values("lid").as("lname").select("rank").values("lid").as("lrank").select("ltaxonid","lname","lrank")) |
| Q13 | SELECT (count(DISTINCT ?genomeid)as ?num) from <http://data.wdcm.org.v1/> where {?genomeid a <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/GenomeNode>;<http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-taxon> <http://gcm.wdcm.org/data/gcmAnnotation1/taxonomy/1437612>.} | g.V().has("vid", "http://gcm.wdcm.org/data/gcmAnnotation1/taxonomy/1437612").inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-taxon").outV().union(\_\_.as("isc").match(\_\_.as("genomeid").outE().has("xlink", "http://www.w3.org/1999/02/22-rdf-syntax-ns#type").inV().has("lid", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/GenomeNode")).select("genomeid")).count() |
| Q14 | SELECT (count(DISTINCT ?geneid) as ?num) from <http://data.wdcm.org.v1/> where {?geneid a <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/GeneNode>;<http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-taxon> <http://gcm.wdcm.org/data/gcmAnnotation1/taxonomy/1437612>.} | g.V().has("vid", "http://gcm.wdcm.org/data/gcmAnnotation1/taxonomy/1437612").inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-taxon").outV().union(\_\_.as("isc").match(\_\_.as("geneid").outE().has("xlink", "http://www.w3.org/1999/02/22-rdf-syntax-ns#type").inV().has("lid", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/GeneNode")).select("geneid")).count() |
| Q15 | SELECT (count(DISTINCT ?proteinid) as ?num) from <http://data.wdcm.org.v1/> where {?proteinid a <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ProteinNode>;<http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-taxon> <http://gcm.wdcm.org/data/gcmAnnotation1/taxonomy/1437612>.} | g.V().has("vid", "http://gcm.wdcm.org/data/gcmAnnotation1/taxonomy/1437612").inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-taxon").outV().union(\_\_.as("isc").match(\_\_.as("proteinid").outE().has("xlink", "http://www.w3.org/1999/02/22-rdf-syntax-ns#type").inV().has("lid", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ProteinNode")).select("proteinid")).count() |
| Q16 | SELECT(count(DISTINCT ?goid) as ?num) from <http://data.wdcm.org.v1/> where {?proteinid a <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ProteinNode>;<http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-taxon> <http://gcm.wdcm.org/data/gcmAnnotation1/taxonomy/1437612>;<http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-go> ?goid.} | g.V().has("vid", "http://gcm.wdcm.org/data/gcmAnnotation1/taxonomy/1437612").inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-taxon").outV().union(\_\_.as("isc").match(\_\_.as("proteinid").outE().has("xlink", "http://www.w3.org/1999/02/22-rdf-syntax-ns#type").inV().has("lid", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ProteinNode"), \_\_.as("proteinid").outE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-go").inV().as("goid"))).select("goid").count() |
| Q17 | SELECT (count(DISTINCT ?pathid) as ?num) from <http://data.wdcm.org.v1/> where {?gene a <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/GeneNode>;<http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-taxon> <http://gcm.wdcm.org/data/gcmAnnotation1/taxonomy/1437612>.?pathid a <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/PathwayNode>;<http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-gene> ?gene.} | g.V().has("vid", "http://gcm.wdcm.org/data/gcmAnnotation1/taxonomy/1437612").inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-taxon").outV().union(\_\_.as("isc").match(\_\_.as("geneid").outE().has("xlink", "http://www.w3.org/1999/02/22-rdf-syntax-ns#type").inV().has("lid", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/GeneNode"), \_\_.as("geneid").inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-gene").outV().as("pathid"), \_\_.as("pathid").outE().has("xlink", "http://www.w3.org/1999/02/22-rdf-syntax-ns#type").inV().has("lid", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/PathwayNode")).select("pathid")).count() |
| Q18 | SELECT (count(?genomeid) as ?num) from <http://data.wdcm.org.v1/> where {?taxonid <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ancestorTaxid> <http://gcm.wdcm.org/data/gcmAnnotation1/taxonomy/1680>.?genomeid a <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/GenomeNode>;<http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-taxon> ?taxonid.} | g.V().has("vid", "http://gcm.wdcm.org/data/gcmAnnotation1/taxonomy/1680").inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ancestorTaxid").outV().union(\_\_.as("isc").match(\_\_.as("taxonid ").inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-taxon").outV().as("genomeid"), \_\_.as("genomeid").outE().has("xlink", "http://www.w3.org/1999/02/22-rdf-syntax-ns#type").inV().has("vid", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/GenomeNode"))) |
| Q19 | SELECT ?taxonid ?name ?genomeid ?accession ?description ?strain from <http://data.wdcm.org.v1/> where {?taxonid <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ancestorTaxid> <http://gcm.wdcm.org/data/gcmAnnotation1/taxonomy/1680>.?nameId a <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/TaxonName>;<http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/taxid> ?taxonid;<http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/nameclass> 'scientificName'; <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/taxname> ?name.?genomeid a <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/GenomeNode>;<http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-taxon> ?taxonid;<http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/accession> ?accession;<http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/definition> ?description.optional{?genomeid <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/strain> ?strain.}} OFFSET 0 Limit 15 | g.V().has("vid", "http://gcm.wdcm.org/data/gcmAnnotation1/taxonomy/1680").union(\_\_.as("isc").match(\_\_.as("taxon").inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ancestorTaxid").outV().as("taxonid"), \_\_.as("taxonid").inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/taxid").outV().has("xtype", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/TaxonName").as("nameid"), \_\_.as("nameid").outE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/nameclass").inV().has("lid", "scientificName"), \_\_.as("nameid").outE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/taxname").inV().as("name"), \_\_.as("taxonid").inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-taxon").has("xtype", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/GenomeNode").outV().as("genomeid"), \_\_.as("genomeid").outE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/accession").inV().as("accession"), \_\_.as("genomeid").outE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/definition").inV().as("description"))).select("taxonid", "name", "genomeid", "accession", "description") |
| Q20 | SELECT count(?geneid) as ?num from <http://data.wdcm.org.v1/> where {?taxonid <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ancestorTaxid> <http://gcm.wdcm.org/data/gcmAnnotation1/taxonomy/1680>.?geneid a <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/GenomeNode>;<http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-taxon> ?taxonid.} | g.V().has("vid", "http://gcm.wdcm.org/data/gcmAnnotation1/taxonomy/1680").inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ancestorTaxid").outV().inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-taxon").outV().match(\_\_.as("geneid").outE().has("xlink", "http://www.w3.org/1999/02/22-rdf-syntax-ns#type").inV().has("lid", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/GenomeNode")).select("geneid") |
| Q21 | SELECT ?taxonid ?name ?genomeid ?geneid ?locusTag ?symbol ?start ?end ?strand ?proteinid ?description from <http://data.wdcm.org.v1/> where {?taxonid <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ancestorTaxid> <http://gcm.wdcm.org/data/gcmAnnotation1/taxonomy/1680>.?nameId <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/taxid> ?taxonid;<http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/nameclass> 'scientificName'; <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/taxname> ?name.?gene a <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/GeneNode>;<http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-taxon> ?taxonid.optional{?gene <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/geneId> ?geneid.}optional{?gene <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/geneId> ?geneid.}optional{?gene <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-genome> ?genomeid.}optional{?gene <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/locusTag> ?locusTag.}optional{?gene <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/symbol> ?symbol.}optional{?gene <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/start> ?start.}optional{?gene <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/end> ?end.}optional{?gene <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/orientation> ?strand.}optional{?proteinid a <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ProteinNode>; <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-taxon> ?taxonid.}optional{?gene <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/description> ?description.}} OFFSET 0 Limit 15 | g.V().has("vid", "http://gcm.wdcm.org/data/gcmAnnotation1/taxonomy/1680").inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ancestorTaxid").outV().match(\_\_.as("taxonid").inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/taxid").outV().as("nameid"), \_\_.as("nameid").outE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/nameclass").inV().has("lid", "scientificName"), \_\_.as("nameid").outE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/taxname").inV().as("name"), \_\_.as("taxonid").inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-taxon").outV().as("gene"), \_\_.as("gene").outE().has("xlink", "http://www.w3.org/1999/02/22-rdf-syntax-ns#type").inV().has("lid", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/GeneNode"), \_\_.as("gene").outE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/geneId").inV().as("geneid")).count() |
| Q22 | SELECT count(\*) as ?num from <http://data.wdcm.org.v1/> where {?taxonid <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ancestorTaxid> <http://gcm.wdcm.org/data/gcmAnnotation1/taxonomy/1680>.?nameId <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/taxid> ?taxonid;<http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/nameclass> 'scientificName';<http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/taxname> ?name.?proteinid a <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ProteinNode>;<http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-taxon> ?taxonid; <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-go> ?goid.?goid <http://www.geneontology.org/formats/oboInOwl#hasOBONamespace> 'biological\_process'.} | g.V().has("vid", "http://gcm.wdcm.org/data/gcmAnnotation1/taxonomy/1680").inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ancestorTaxid").outV().match(\_\_.as("taxonid").inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/taxid").outV().as("nameid"), \_\_.as("nameid").outE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/nameclass").inV().has("lid", "scientificName"), \_\_.as("nameid").outE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/taxname").inV().as("name"), \_\_.as("taxonid").inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-taxon").outV().as("proteinid"), \_\_.as("proteinid").outE().has("xlink", "http://www.w3.org/1999/02/22-rdf-syntax-ns#type").inV().has("lid", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ProteinNode"), \_\_.as("proteinid").outE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-go").inV().as("goid"), \_\_.as("goid").outE().has("xlink", "http://www.geneontology.org/formats/oboInOwl#hasOBONamespace").inV().has("lid", "biological\_process")).count() |
| Q23 | SELECT distinct ?taxonid ?name ?goid ?definition ?goname from <http://data.wdcm.org.v1/> where {?taxonid <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ancestorTaxid> <http://gcm.wdcm.org/data/gcmAnnotation1/taxonomy/1680>.?nameId <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/taxid> ?taxonid;<http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/nameclass> 'scientificName';<http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/taxname> ?name.?proteinid a <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ProteinNode>;<http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-taxon> ?taxonid; <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-go> ?goid.?goid <http://www.geneontology.org/formats/oboInOwl#hasOBONamespace> 'biological\_process'.optional{?goid <http://purl.obolibrary.org/obo/IAO\_0000115> ?definition.}optional{?goid <http://www.w3.org/2000/01/rdf-schema#label> ?goname.}} OFFSET 0 Limit 15 | g.V().has("vid", "http://gcm.wdcm.org/data/gcmAnnotation1/taxonomy/1680").inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ancestorTaxid").outV().match(\_\_.as("taxonid").inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/taxid").outV().as("nameid"), \_\_.as("nameid").outE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/nameclass").inV().has("lid", "scientificName"), \_\_.as("nameid").outE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/taxname").inV().as("name"), \_\_.as("taxonid").inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-taxon").outV().as("proteinid"), \_\_.as("proteinid").outE().has("xlink", "http://www.w3.org/1999/02/22-rdf-syntax-ns#type").inV().has("lid", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ProteinNode"), \_\_.as("proteinid").outE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-go").inV().as("goid")).count() |
| Q24 | select count(\*) as ?num where {?taxonid <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ancestorTaxid> <http://gcm.wdcm.org/data/gcmAnnotation1/taxonomy/1680>. ?geneid a <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/GeneNode>;<http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-taxon> ?taxonid. ?pathwayid a <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/PathwayNode>;<http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-gene> ?geneid.FILTER (regex(?taxonid,'aa')||regex(?pathwayid,'aa')||regex(?pathwayname,'aa')||regex(?pathwayclass,'aa'))} | g.V().has("vid", "http://gcm.wdcm.org/data/gcmAnnotation1/taxonomy/1680").inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ancestorTaxid").outV().inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-taxon").outV().match(\_\_.as("geneid").outE().has("xlink", "http://www.w3.org/1999/02/22-rdf-syntax-ns#type").inV().has("lid", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/GeneNode"), \_\_.as("geneid").inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-gene").outV().as("pathwayid"), \_\_.as("pathwayid").outE().has("xlink", "http://www.w3.org/1999/02/22-rdf-syntax-ns#type").inV().has("lid", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/PathwayNode")).count() |
| Q25 | select ?taxonid ?pathwayid ?pathwayclass ?pathwayname  where {  ?taxonid <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ancestorTaxid> <http://gcm.wdcm.org/data/gcmAnnotation1/taxonomy/1680>.  ?geneid a <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/GeneNode>;  <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-taxon> ?taxonid.  ?pathwayid a <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/PathwayNode>;  <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-gene> ?geneid.  optional{?pathwayid <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/name> ?pathwayname.}  optional{?pathwayid <http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/organism>?pathwayclass.}  }OFFSET 0 Limit 15 | g.V().has("vid", "http://gcm.wdcm.org/data/gcmAnnotation1/taxonomy/1680").inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/ancestorTaxid").outV().inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-taxon").outV().match(\_\_.as("geneid").outE().has("xlink", "http://www.w3.org/1999/02/22-rdf-syntax-ns#type").inV().has("lid", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/GeneNode"), \_\_.as("geneid").inE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/x-gene").outV().as("pathwayid"), \_\_.as("pathwayid").outE().has("xlink", "http://www.w3.org/1999/02/22-rdf-syntax-ns#type").inV().has("lid", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/PathwayNode"),\_\_.as("pathwayid").outE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/name").inV().as("pathwayname"), \_\_.as("pathwayid").outE().has("xlink", "http://gcm.wdcm.org/ontology/gcmAnnotaion/v1/organism").inV().as("pathwayclass")).limit(15).select("geneid").values("vid").as("lgeneid").select("pathwayid").values("vid").as("lpathwayid").select("pathwayclass").values("lid").as("lpathwayclass").select("pathwayname").values("lid").as("lpathwayname").select("lgeneid", "lpathwayid", "lpathwayclass", "lpathwayname") |