

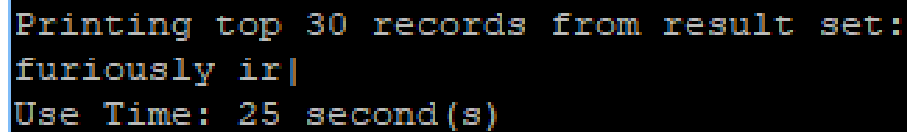
## COMP 530 Assignment 7

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### Test Results:

Query 1:

```
select
    l.l_comment
from
    lineitem as l
where
    (l.l_shipdate = "1994-05-12") and
    (l.l_commitdate = "1994-05-22") and
    (l.l_receiptdate = "1994-06-10");
```



Printing top 30 records from result set:  
furiously ir|  
Use Time: 25 second(s)

Query 2:

```
select
    l.l_orderkey
from
    lineitem as l
where
    (l.l_shipinstruct = "TAKE BACK RETURN") and
    (l.l_extendedprice / l.l_quantity > 1759.6) and
    (l.l_extendedprice / l.l_quantity < 1759.8);
```

```
Printing top 30 records from result set:
2259138|
2261506|
2262272|
2271712|
2274055|
2275105|
2278177|
2282818|
2283714|
2293604|
2295650|
2304581|
2304739|
2310785|
2310982|
2323331|
2326915|
2330400|
2330848|
2332832|
2333698|
2334311|
2334433|
2345602|
2360961|
2365281|
2366023|
2369863|
2369893|
2377408|
Use Time: 25 second(s)
```

Query 3:

```
select
    sum (1),
    avg ((o.o_totalprice - 32592.14) / 32592.14)
from
    orders as o
where
    (o.o_orderstatus = "F") and
    (o.o_orderpriority < "2-HIGH" or o.o_orderpriority = "2-HIGH");
```

```
Printing top 30 records from result set:
292098|3.620425|
Use Time: 4 second(s)
```

Query 4:

```
select
    avg (o.o_totalprice),
    "order priority was " + o.o_orderpriority
from
    orders as o
where
    (o.o_orderstatus = "F")
group by
    o.o_orderpriority;
```

```
Printing top 30 records from result set:
150611.604523|order priority was 5-LOW|
150129.831018|order priority was 4-NOT SPECIFIED|
150068.606146|order priority was 3-MEDIUM|
150724.811169|order priority was 2-HIGH|
150454.466436|order priority was 1-URGENT|
Use Time: 5 second(s)
```

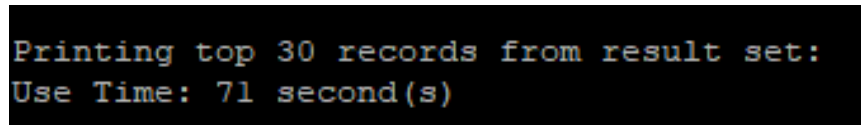
Query 5:

```
select
    "return flag was " + l.l_returnflag,
    sum (l.l_quantity),
    sum (l.l_extendedprice),
    sum (l.l_extendedprice*(1-l.l_discount)),
    sum (l.l_extendedprice*(1-l.l_discount)*(1+l.l_tax)),
    avg (l.l_quantity),
    avg (l.l_extendedprice),
    avg (l.l_discount),
    sum (1)
from
    lineitem as l
where
    (l.l_shipdate < "1998-12-01") and
    (l.l_shipdate > "1998-06-01")
group by
    l.l_returnflag;
```

```
Printing top 30 records from result set:
return flag was N|6249170|9372388639.749935|313614688|669759735|25.487259|38225.315430|0.050036
|245188|
Use Time: 26 second(s)
```

Query 6:

```
select
    l.l_shipmode,
    sum (1)
from
    orders as o,
    lineitem as l
where
    (o.o_orderkey = l.l_orderkey)
    and (o.o_orderstatus = "F")
    and (l.l_shipmode = "truck" or l.l_shipmode = "rail")
    and (l.l_commitdate < l.l_receiptdate)
    and (l.l_shipdate < l.l_commitdate)
    and (l.l_receiptdate > "1996-06-20" or l.l_receiptdate = "1996-
06-20")
    and (l.l_receiptdate < "1997-06-20" or l.l_receiptdate = "1997-
06-20")
group by
    l.l_shipmode;
```



Printing top 30 records from result set:  
Use Time: 71 second(s)

Query 7:

```
select
    ps.ps_partkey,
    avg (ps.ps_supplycost)
from
    part as p,
    partsupp as ps,
    supplier as s,
    nation as n,
    region as r
where
    (p.p_partkey = ps.ps_partkey)
    and (s.s_suppkey = ps.ps_suppkey)
    and (s.s_nationkey = n.n_nationkey)
    and (n.n_regionkey = r.r_regionkey)
    and (r.r_name = "AMERICA")
group by
    ps.ps_partkey;
```

```

Printing top 30 records from result set:
1|665.290000|
2|646.880000|
5|219.830000|
7|763.980000|
8|916.910000|
9|188.020000|
10|418.635000|
12|498.395000|
13|409.506667|
14|891.445000|
15|458.670000|
18|367.633333|
19|144.800000|
20|675.540000|
23|103.130000|
25|694.350000|
27|348.610000|
28|204.860000|
29|857.885000|
33|929.050000|
34|265.310000|
35|540.180000|
37|15.720000|
43|493.190000|
44|608.080000|
45|919.630000|
46|106.800000|
48|611.160000|
53|388.080000|
54|686.510000|
Use Time: 7 second(s)

```

Query 8:

```

select
    n.n_name,
    o.o_orderdate,
    l.l_extendedprice * (1 - l.l_discount) - ps.ps_supplycost *
l.l_quantity
from
    part as p,
    supplier as s,
    lineitem as l,
    partsupp as ps,
    orders as o,
    nation as 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 = l1.l_partkey)
and (o.o_orderkey = l1.l_orderkey)
and (s.s_nationkey = n.n_nationkey)
and (p.p_type = "STANDARD POLISHED TIN" or
      p.p_type = "ECONOMY BRUSHED TIN" or
      p.p_type = "ECONOMY POLISHED NICKEL" or
      p.p_type = "SMALL ANODIZED COPPER");

```

```

Printing top 30 records from result set:
Use Time: 79 second(s)

```

Query 9:

```

select
  "supplier name was " + s.s_name,
  sum (1)
from
  supplier as s,
  lineitem as l1,
  lineitem as l2,
  orders as o,
  nation as n
where
  (s.s_suppkey = l1.l_suppkey)
  and (o.o_orderkey = l1.l_orderkey)
  and (o.o_orderstatus = "F")
  and (l1.l_receiptdate > l1.l_commitdate)
  and (l2.l_orderkey = l1.l_orderkey)
  and (not l2.l_suppkey = l1.l_suppkey)
group by
  s.s_name;

```

```
Printing top 30 records from result set:
supplier name was Supplier#000008245|60|
supplier name was Supplier#000003702|60|
supplier name was Supplier#000007746|60|
supplier name was Supplier#000008567|56|
supplier name was Supplier#000000070|3526|
supplier name was Supplier#000005654|20|
supplier name was Supplier#000006107|48|
supplier name was Supplier#000002798|98|
supplier name was Supplier#000008080|48|
supplier name was Supplier#000008207|48|
supplier name was Supplier#000000589|98|
supplier name was Supplier#000004006|98|
supplier name was Supplier#000002608|98|
supplier name was Supplier#000005584|98|
supplier name was Supplier#000007100|98|
supplier name was Supplier#000002899|60|
supplier name was Supplier#000001915|60|
supplier name was Supplier#000004553|60|
supplier name was Supplier#000001254|112|
supplier name was Supplier#000006049|112|
supplier name was Supplier#000006231|112|
supplier name was Supplier#000003010|48|
supplier name was Supplier#000000624|48|
supplier name was Supplier#000002620|48|
supplier name was Supplier#000000503|50|
supplier name was Supplier#000006435|86|
supplier name was Supplier#000000616|50|
supplier name was Supplier#000009315|70|
supplier name was Supplier#000007025|70|
supplier name was Supplier#000007880|70|

Use Time: 181 second(s)
```

Query 10:

```
select
    "date was " + o.o_orderdate,
    avg (l.l_extendedprice * (1-l.l_discount))
from
    part as p,
    supplier as s,
    lineitem as l,
    orders as o,
    customer as c,
```

```

        nation as n1,
        nation as n2,
        region as r1,
        region as r2
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 = r1.r_regionkey)
    and (r1.r_name = "AMERICA")
    and (n2.n_regionkey = r2.r_regionkey)
    and (r2.r_name = "MIDDLE EAST")
    and (s.s_nationkey = n2.n_nationkey)
    and (o.o_orderdate > "1995-01-01" or o.o_orderdate = "1995-01-
01")
    and (o.o_orderdate < "1996-12-31" or o.o_orderdate = "1996-12-
31")
    and (p.p_type = "ECONOMY ANODIZED STEEL")
group by
    o.o_orderdate;

```

```

Printing top 30 records from result set:
Use Time: 30 second(s)

```

In the project, we implemented aggregation, selection and join. Inside scan join, we'll reduce all the useless columns (does not appear in the select, where or group by). Then, we organized an optimal schedule for the tables to perform joins, from smaller to larger, as long as there's disjunctions that help them to connect. With the help of these features, the SQL parser can parse and perform a query quickly with less memory.