11   Sales Example I

This assignment contains information up to and including aggregate functions and dates. We will be using the table sp.mast which contains the following columns:

Column Name	Description
SID	This is the Salesperson's ID number.
spname	This is the Salesperson's name.
daysworked	The number of total days that the salesperson has worked.
itemssold	The total number of items that the salesperson sold.
bonus	If the salesperson was under the high- or low- bonus plan.
region	What region they worked in.
startdate	The date that they started.
salesdt	The date that the particular sales occurred.
descr	A description of the item sold.
cost	The cost of the item (in cents).
prc	The price of the item (in cents).

Figure D.12: Information regarding SP.MAST

1. How many total sales are in the database?

```
select sum(1) from sp.mast;
```

2. How many sales were completed each month?

```
select count(1), date_trunc('month', salesdt)
from sp.mast group by 2 order by 2;
```

3. How many sales were completed by region?

```
select count(1), region
from sp.mast group by 2 order by 2;
```

4. Using another tool (such as Excel or Google Docs) prepare a graph which contains the following information:

   (a) Month

   (b) Number of sales for that month

   (c) Total Revenue from sales that month

   (d) Total cost of items from that month

```
select
        count(1) as ct
        , date_trunc('month', salesdt)
        , sum(prc) / 100.0 as totalRev
        , sum(cost) / 100.0 as totalCost
from sp.mast group by 2 order by 2;
```

5. Using another tool (such as Excel or Google Docs) prepare a graph which shows, by region and month, the amount of *profit* generated. This should have four lines – one for each region.

```
select
        date_trunc('month', salesdt) as mnt
        , region
        , sum(prc - cost) / 100.0 as prft
from sp.mast
group by 1,2 order by 2,1;
```

6. Identify the top 7 sales people (name and SID) in terms of total revenue generated.

```
select spname, sid
from sp.mast
group by 1,2
order by sum( prc) desc limit 7;
```

7. Plot the monthly revenue (combined) for the top 7 salespeople.

```
select sum(prc) , date_trunc('month', salesdt) as mnt
from sp.mast
where sid in
        (select sid
        from sp.mast
        group by 1
        order by sum( prc) desc limit 7)
group by 2
order by 2;
```

8. Create a pie chart which breaks down all revenue into one of four categories: (a) the salesperson worked less than 10 days (b) the salesperson worked between 10 and 20 days (c) the salesperson worked between 20 and 50 days and (d) the salesperson worked more than 50 days.

```
select sum(prc) as rev,
        case
                when daysworked < 10 then 1
                when daysworked < 20 then 2
                when daysworked < 50 then 3
                else 4
        end
from
        sp.mast
group by 2;
```

9. Calculate the average profit *per region*. In particular, calculate the profit per region and then find the average over the regions.

```
select
        avg(prft) as prft
from
        (select sum(prc - cost) as prft
                from sp.mast
                group by region) as innerq;
```

10. We want to understand where we should concentrate our business – high margin items (which are those where the profit margin (price - cost)/cost >= 23%) or mid margin items (those where the profit margin is between 23% and 18%) or low-margin items (profit margin less than 18%). Create a dataset which identifies, for each distinct item, what margin group (high-, mid-, or low-) it is in.

```
select
        iid
        ,case
                when (prc-cost)::float / cost >= .23 then 'high'
                when (prc-cost)::float / cost >= .18 then 'mid'
                else 'low' end as margin
from
(select distinct prc, cost, iid from sp.mast) as innerQ
```

11. What was the average number of days that a salesperson worked? In particular, identify the number of days that each salesperson worked and then calculate the average of it.

```
select avg( days) as avgdays
from
        (select sid, max(daysworked) as days
        from sp.mast group by 1) as innerQ;
```

12. Salespeople are paid based on one of two plans: The "H" bonus plan which means that they are paid $130 per day, but receive a 10% commission or the "L" bonus plan which they are paid $150 per day, but receive a 5% commission. Calculate the amount of money that each salesperson made *on the non-commission* part.

```
select sid,
case when max(bonus) = 'H' then 130.0*max(daysworked)
else 150*max(daysworked) end as totalcomp
from sp.mast group by 1;
```

13. Calculate the total compensation paid to each salesperson, including both the commission and non-commission portion.

```
select
        sid
        , case
                when max(bonus) = 'H' then 130.0*max(daysworked) + sum(prc/100.0)*.1
                else 150*max(daysworked) + sum(prc/100.0)*.05 end as totalcomp
from sp.mast group by 1;
```

14. The company is thinking about changing the bonus plan so that the "H" bonus plan would be $100 per day, but 20% commission and the "L" bonus Play would be $175 per day with no commission.

Calculate the number of salespeople, within each bonus plant, that would be better off under the new vs. the old plan.

```
select count(1), bh, case when totalcomp > totalcomp2 then 1 else 0 end
from (
select
        sid, max(bonus) as bh
        , case
                when max(bonus) = 'H' then 130.0*max(daysworked) + sum(prc)/100.0*.1
                else 150*max(daysworked) + sum(prc)/100.0*.05 end as totalcomp
        , case
                when max(bonus) = 'H' then 100.0*max(daysworked) + sum(prc)/100.0*.2
                else 175*max(daysworked) end as totalcomp2

        from sp.mast

        group by 1) as iq group by 2,3;
```

15. Write a query which returns the following data per region:

    (a) The total profit (price - cost)

    (b) The average profit per salesperson

    (c) The total number of items sold

```
select
        region
        , sum(prc - cost) as prft
        , sum(prc - cost)::float / count(distinct sid) as pftPerPerson
        , count(1) as numSol
from
        sp.mast
group by 1;
```

16. Write a query which returns the following data, this time by margin – high margin items (which are those where the profit margin (price - cost)/cost $>=$ 23%) or mid margin items (those where the profit margin is between 23% and 18%) or low-margin items (profit margin less than 18%).

    (a) The total profit (price - cost)

    (b) The average profit per item

    (c) The total number of items sold

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```
select
        case
                when (prc-cost)::float / cost >= .23 then 'high'
                when (prc-cost)::float / cost >= .18 then 'mid'
                else 'low' end as margin

        , sum(prc - cost) as prft
        , sum(prc - cost)::float / count(1) as pftPeritem
        , count(1) as numSol
from
        sp.mast
group by 1;
```