%This is a LaTeX template for homework assignments

\documentclass{article}

\usepackage[utf8]{inputenc}

\usepackage{amssymb,amsmath,mathrsfs}

\usepackage{enumitem}

\usepackage{graphicx}

\usepackage{float}

\def\ojoin{\setbox0=\hbox{$\bowtie$}%

\rule[-.02ex]{.25em}{.4pt}\llap{\rule[\ht0]{.25em}{.4pt}}}

\def\leftouterjoin{\mathbin{\ojoin\mkern-5.8mu\bowtie}}

\def\rightouterjoin{\mathbin{\bowtie\mkern-5.8mu\ojoin}}

\def\fullouterjoin{\mathbin{\ojoin\mkern-5.8mu\bowtie\mkern-5.8mu\ojoin}}

\begin{document}

\section\*{DBMS LAB-4}

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\subsection\*{Question 1}

\begin{flushleft}

\begin{enumerate}[label=(\alph\*)]

\item \begin{flushleft}

$\sigma\_{(stock<reorderlevel)}(items)$\\

\bigskip

SELECT \* \\

FROM items \\

WHERE stock $<$ reorderlevel;

\end{flushleft}

\item \begin{flushleft}

$\sideset{\_{invdate}}{}{\mathscr{F}}\_{sum(qty\*price)}(\mbox{sales} \bowtie\_{s.invno=sd.invno} \mbox{salesdetails}) $\\

\bigskip

SELECT invdate, sum(qty\*price) \\

FROM sales as s \\

JOIN salesdetails as sd \\

ON (s.invno=sd.invno) \\

GROUP BY invdate;

\end{flushleft}

\item \begin{flushleft}

$\sigma((\sideset{\_{custid}}{}{\mathscr{F}}\_{sum(qty\*price)} (\mbox{salesdetails} \bowtie\_{s.invno=sd.invno} \mbox{sales})) \bowtie\_{s.customerid=c.custid} \mbox{customer}) \mbox{ORDER BY sum desc LIMIT 1} $\\

\bigskip

SELECT \* \\

FROM ( SELECT sum(qty\*price), custid \\

\quad \quad \quad \quad FROM (salesdetails as sd \\

\quad \quad \quad \quad JOIN sales as s \\

\quad \quad \quad \quad ON (s.invno=sd.invno) ) \\

JOIN customer as c \\

ON (s.customerid=c.custid) \\

GROUP BY c.custid) as r1 \\

ORDER BY sum desc LIMIT 1;

\end{flushleft}

\item \begin{flushleft}

$\sideset{\_{itemcode}}{}{\mathscr{F}}\_{sum(qty)}(salesdetails)\mbox{ORDER BY sum desc LIMIT 1 OFFSET 1} $\\

\bigskip

SELECT sum(qty) \\

FROM salesdetails \\

GROUP BY itemcode \\

ORDER BY sum desc \\

LIMIT 1 OFFSET 1;

\end{flushleft}

\item \begin{flushleft}

$\sideset{\_{customerid}}{}{\mathscr{F}}\_{sum(sd.price-i.averagepurchaseprice)} (\mbox{salesdetails} \bowtie\_{sd.invno=s.invno} \mbox{sales} \bowtie\_{sd.itemcode=i.code} \mbox{items}) \mbox{ORDER BY sum desc LIMIT 1}$\\

\bigskip

SELECT sum(sd.price-i.averagepurchaseprice), customerid \\

FROM (salesdetails as sd \\

JOIN sales as s \\

ON (sd.invno=s.invno) \\

JOIN items as i \\

ON (sd.itemcode=i.code)) \\

GROUP BY customerid \\

ORDER BY sum desc LIMIT 1;

\end{flushleft}

\item \begin{flushleft}

$\sideset{\_{itemcode,year}}{}{\mathscr{F}}\_{(sum(qty),itemcode,extract(year FROM invdate)\longrightarrow year)}(\mbox{salesdetails} \bowtie\_{sd.invno=s.invno} \mbox{sales}) \mbox{ORDER BY sum desc LIMIT 1}$\\

\bigskip

SELECT sum(qty), sd.itemcode , extract(year FROM invdate) as year\\

FROM salesdetails as sd \\

JOIN sales as s \\

ON (sd.invno=s.invno) \\

GROUP BY sd.itemcode, extract(year FROM invdate) \\

ORDER BY sum desc LIMIT 1;

\end{flushleft}

\item \begin{flushleft}

$ \pi\_{(i.code,c.\*)}(\sigma(\mbox{salesdetails} \bowtie\_{s.invno=sd.invno} \mbox{sales} \bowtie\_{s.customerid=c.custid} \mbox{customer} \rightouterjoin\_{i.code=sd.itemcode} \mbox{items} ))$\\

\bigskip

SELECT i.code , c.\* \\

FROM salesdetails as sd \\

JOIN sales as s \\

ON s.invno=sd.invno \\

JOIN customer as c \\

ON s.customerid=c.custid \\

RIGHT JOIN items as i \\

ON i.code=sd.itemcode;

\end{flushleft}

\end{enumerate}

\end{flushleft}

\subsection\*{Question 2}

\begin{flushleft}

\begin{enumerate}[label=(\alph\*)]

\item \begin{flushleft}

$ \pi\_{(r1.instructorid,r2.instructorname,r2.coursename,r1.acadyear,r1.semester)} ($ \\

$( \sideset{\_{instructorid,semester,acadyear}}{}{\mathscr{F}}\_{count(courseno)} (\mbox{offers}) \mbox{HAVING count(courseno)$>$1})\longrightarrow r1 \bowtie\_{(r1.instructorid=r2.instructorid \, \& \, r1.semester=r2.semester \, \& \, r1.acadyear=r2.acadyear)} (\sideset{\_{instructorid,semester,acadyear}}{}{\mathscr{F}}\_{count(courseno)} (\mbox{offers}) \mbox{HAVING count(courseno)$>$1}) \longrightarrow r2

) $\\

\bigskip

SELECT r1.instructorid,r2.instructorname,r2.coursename,r1.acadyear,r1.semester\\ FROM ( SELECT count(courseno),instructorid,semester,acadyear \\

\quad \quad \quad \quad FROM offers \\

\quad \quad \quad \quad GROUP by instructorid,semester,acadyear \\

\quad \quad \quad \quad HAVING count(courseno)$>$1) AS r1 \\

JOIN \\

\quad \quad \quad \quad (SELECT \* \\

\quad \quad \quad \quad FROM course as c \\

\quad \quad \quad \quad NATURAL JOIN offers as o \\

\quad \quad \quad \quad NATURAL JOIN instructor as i ) as r2 \\

ON (r1.instructorid=r2.instructorid AND r1.semester=r2.semester AND r1.acadyear=r2.acadyear);\\

\end{flushleft}

\item \begin{flushleft}

$(\sigma(\mbox{course} \leftouterjoin\_{c.courseno=o.courseno} \mbox{offers}))-(\sigma(\mbox{course} \rightouterjoin\_{c.courseno=o.courseno} \mbox{offers})) $\\

\bigskip

SELECT \* \\

FROM course as c \\

LEFT JOIN offers as o \\

ON (c.courseno=o.courseno) \\

EXCEPT \\

SELECT \* \\

FROM course as c \\

RIGHT JOIN offers as o\\

ON (c.courseno=o.courseno);\\

\end{flushleft}

\item \begin{flushleft}

$\sigma\_{(t.sum<10 \, or \, t.sum>20) \, \& \, progname=Btech(CS) \, \& \, t.batch=2007}(\pi\_{(name,studentid,sum,progid,batch)}$\\

$ (\sideset{\_{studentid}}{}{\mathscr{F}}\_{sum(credit)}(\mbox{course} \bowtie\_{c.courseno=r.courseno} \mbox{registers} \bowtie\_{s.studentid=r.studentid} \mbox{student})) \longrightarrow \mbox{t} \bowtie\_{t.progid=p.progid} \mbox{program}) $\\

\bigskip

SELECT \* \\

FROM ( SELECT s.name, s.studentid,sum(c.credit),s.progid,s.batch \\

\quad \quad \quad \quad FROM course as c \\

\quad \quad \quad \quad JOIN registers as r \\

\quad \quad \quad \quad ON (c.courseno=r.courseno) \\

\quad \quad \quad \quad JOIN student as s \\

\quad \quad \quad \quad ON (s.studentid=r.studentid) \\

\quad \quad \quad \quad GROUP BY s.studentid ) as t \\

JOIN program as p \\

ON (t.progid=p.progid) \\

WHERE (t.sum$<$10 or t.sum$>$20) AND p.progname='Btech(CS)' AND t.batch='2007';\\

\end{flushleft}

\item \begin{flushleft}

$ \pi\_{(s1.studentid,s1.name)}( \sigma\_{count>1}(( \sideset{\_{t.studentid}}{}{\mathscr{F}}\_{count()grade}(\pi\_{s.studentid,s.name,r.grade}$\\

$ (\sigma\_{grade='FF'}(\mbox{registers} \longrightarrow r \bowtie\_{s.studentid=r.studentid} \mbox{student} \longrightarrow s)\longrightarrow t) )) \longrightarrow t1 \bowtie\_{s1.studentid=t1.studentid} \mbox{student} \longrightarrow s1 ) )$\\

\bigskip

SELECT s1.studentid,s1.name \\

FROM ( SELECT count(grade),t.studentid \\

\quad \quad \quad \quad FROM ( SELECT s.studentid,s.name,r.grade \\

\quad \quad \quad \quad \quad \quad \quad \quad FROM registers as r \\

\quad \quad \quad \quad \quad \quad \quad \quad JOIN student as s \\

\quad \quad \quad \quad \quad \quad \quad \quad ON (s.studentid=r.studentid) \\

\quad \quad \quad \quad \quad \quad \quad \quad WHERE grade='FF') as t \\

\quad \quad \quad \quad GROUP BY t.studentid) as t1 \\

JOIN student as s1 \\

ON (s1.studentid=t1.studentid) \\

WHERE count$>$1;\\

\end{flushleft}

\item \begin{flushleft}

$ $\\

\bigskip

select studentid,name

from student as st

natural join

(select rs1.studentid,count(courseno) from registers as rs1

where rs1.courseno

in

(select o1.courseno

from offers as o1

natural join

instructor as i1

where (instructorname='P M Jat' and (acadyear>=2007 or acadyear<=2011)))

group by studentid

having

(count(courseno)=(select count(courseno) from offers as o1 natural join instructor as i1

where (instructorname='P M Jat' and (acadyear>=2007 or acadyear<=2011)))))as r5;

\end{flushleft}

\end{enumerate}

\end{flushleft}

\end{document}