Exercise N:1
Consider the following transactions:
T1: read(A), read(B); B:=A+1; write(B);
T2: read(B); read(A); A:=B+1; write(A);
1) Rewrite T1 and T2 so that they follow the 2PL protocol.
2) Give an incomplete schedule of these two transactions that can result in a deadlock.

Exercise N:2
1) If the basic TO is used, what will happen with the following incomplete schedule?
r2(Z),r2(Y),w2(Y),r3(Y),r3(Z),r1(X),w1(X),w3(Y),w3(Z),r2(X),r1(Y),w1(Y), w2(X).

2) Apply the multiversion timestamp technique to the following incomplete schedule (assume initial value of A in the DB equals to 100):

<table>
<thead>
<tr>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
</tr>
</thead>
<tbody>
<tr>
<td>TS(T1)=150</td>
<td>TS(T2)=200</td>
<td>TS(T3)=175</td>
<td>TS(T4)=225</td>
</tr>
<tr>
<td>R1(A); A:=A+1; w1(A);</td>
<td>r2(A); A:=A+2; w2(A);</td>
<td>r3(A);</td>
<td>r4(A);</td>
</tr>
<tr>
<td>.</td>
<td>.</td>
<td>r3(A);</td>
<td>.</td>
</tr>
<tr>
<td>A:=A+8; w3(A);</td>
<td>.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Exercise N:3
State which of these protocols –conservative 2PL, strict 2PL, and Timestamps with Thomas Write Rule- would allow the execution of these two complete schedules – i.e. allow the execution to occur exactly in the order shown:-
1) S(1): r1(Y),w2(X),w1(X),c2,c1.
2) S(2): w1(X),r2(X),w1(X),a2,c1.

Exercise N:4
Under the MGL protocol, we want to execute 3 transactions according to this incomplete schedule: T1 updates f1, T2 updates r221, T3 reads r121, ....
If we assume a granularity hierarchy as the one illustrated in fig. 20.7 p.680 of the course book, then can we respect the above order?