1.  **Consider a relation scheme R = (A, B, C, D, E, H) on which the following functional dependencies hold: {A–>B, BC–> D, E–>C, D–>A}. What are the candidate keys of R?**

    Closure of AEH, i.e. AEH+ = {ABCDEH}
    Closure of BEH, i.e. BEH+ = {ABCDEH}
    Closure of DEH, i.e. DEH+ = {ABCDEH}

    Candidate keys of R (AEH,BEH,DEH)

2.  Consider schema R = (A, B, C, G, H, I) and the set F of functional dependencies {A → B, A → C, CG → H, CG → I, B → H}. Prove that AG → I Holds.

    R = (A, B, C, G, H, I)
    F = { A → B, A → C, CG → H, CG → I, B → H}
    • some members of F+ − A → H
    • by transitivity from A → B and B → H − AG → I
    • by augmenting A → C with G, to get AG → CG and then transitivity with CG → I

3.  Consider the relation scheme R = {E, F, G, H, I, J, K, L, M, M} and the set of functional dependencies {{E, F} -> {G}, {F} -> {I, J}, {E, H} -> {K, L}, K -> {M}, L -> {N} on R. What is the key for R?

    $\{E, F, H\}^+ = \{E, F, H, G, I, J, K, L, M, N\}$

    ∴ it is a key

    Key for R is {E, F, H}.

4.  Compute the closure of the following set F of functional dependencies for relation schema R = (A, B, C, D, E). A –> BC   CD –> E B –>D E –> A List the candidate keys for R.

    ```
    A -> BC, B -> D so A -> D so A -> DC -> E
    therefore A -> ABCDE

    E -> A, A -> ABCDE, so E -> ABCDE
    CD -> E, so CD -> ABCDE
    B -> D, BC -> CD, so BC -> ABCDE

    Attribute closure:
    A -> ABCDE
    B -> BD
    C -> C
    D -> D
    E -> ABCDE
    AB -> ABCDE
    AC -> ABCDE
    AD -> ABCDE
    AE -> ABCDE
    BC -> ABCDE
    BD -> BD
    BE -> ABCDE
    ```

```
CD  -> ABCDE
CE  -> ABCDE
DE  -> ABCDE
ABC -> ABCDE
ABD -> ABCDE
ABE -> ABCDE
ACD -> ABCDE
ACE -> ABCDE
ADE -> ABCDE
BCD -> ABCDE
BDE -> ABCDE
CDE -> ABCDE
ABCD -> ABCDE
ABCE -> ABCDE
ABDE -> ABCDE
ACDE -> ABCDE
BCDE -> ABCDE

The candidate keys are A, E, CD, and BC
```

5. Write a PL/SQL program that fetches records of all students and insert record as students having CPI > 4 in ELIGIBLE table and students having CPI <= 4 in NOT_ELIGIBLE table from student_master table.