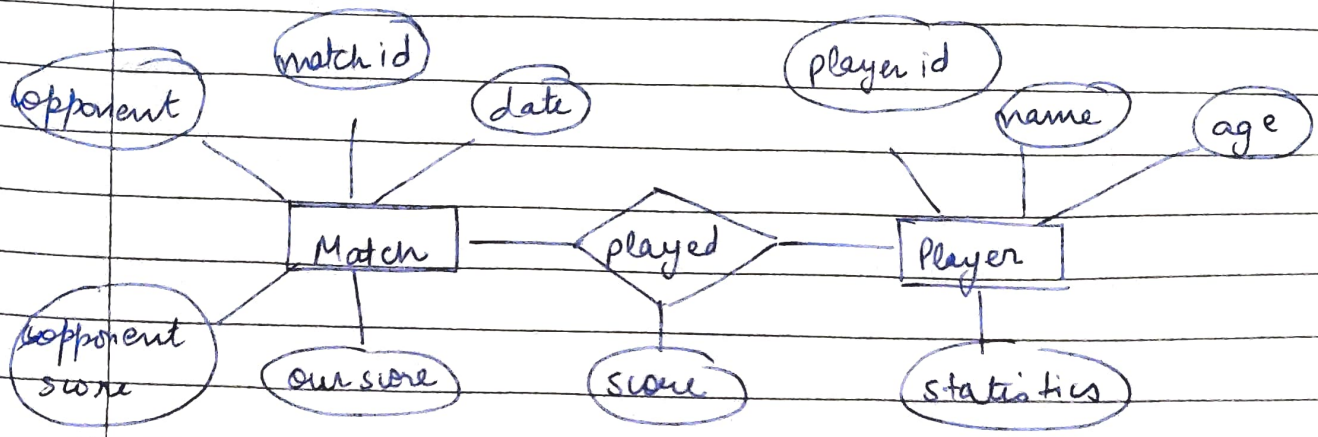
Ans 1:- The ER model is:



The information required:

1) The matches played.
2) The score in each match
3) Indian players in each match
4) Player statistics for each match

So, to describe all the important details of the match we can have one match entity. eg. date, our score, opponent score, opponent team and the match id.

⇒ The match id will be unique primary key for the entity.

⇒ We can have one player entity with → name, player id, age and statistics.

They can be joined by a many match to many players relationship by a played relationship which will store.
player id, match id and score of that player.

Ans 2: Entities:

Company → (company name, city)
Employee → (person name, street, city)
Manages → (person name, manager-name)
Works → (person name, company name, salary)

1). Find the names and cities of residence of all employees who work for TCS.

Relational → $\Pi_{person name, city}(employee \bowtie (company name = TCS(works)))$

TRC → $\{ t \mid \exists s \in employee (t[person name] = s[person name] \wedge t[city] = s[city] \wedge \exists u \in works (u[company name] = "TCS" \wedge u[person name] = s[person-name])) \}$

DRS → $\{ \langle pn, c \rangle \mid \exists s, \exists [\langle pn, s, c \rangle \in employee \wedge \exists cn, sl [\langle cn, sl \rangle \in works \wedge cn = 'TCS']] \}$

4) Find the names of all employees in this database who live in the same city as the company they work

$\Rightarrow \Pi_{person\text{-}name}(employee \bowtie works \bowtie company)$

3)

$\Rightarrow \Pi_{person\ name}(\sigma_{company\ name \neq "FCS"(works)})$

of not for any company.

$\Pi_{person\ name}(employee) - \Pi_{person\ name}(\sigma_{company\ name = "FCS"(works)})$

4) $\Pi_{company\ name}(company \div \Pi_{city}(\sigma_{company\text{-}name = "FCS"(company)}))$