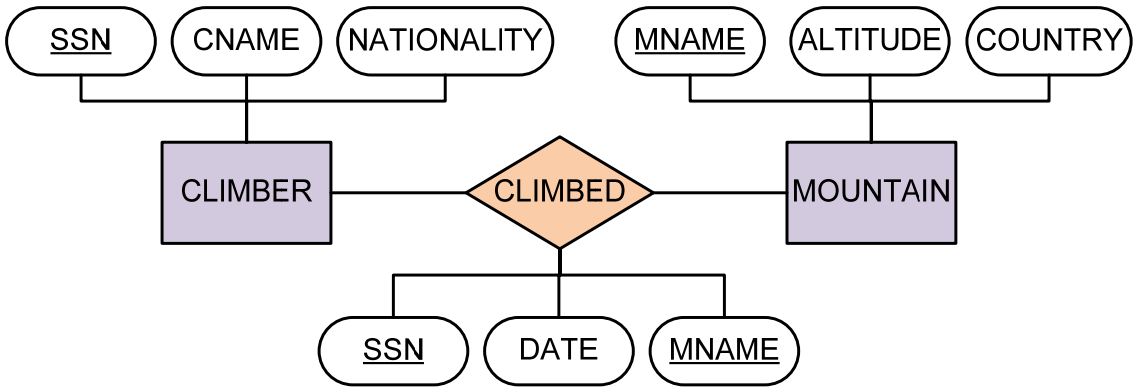
HW #5

Salim Sarımurat

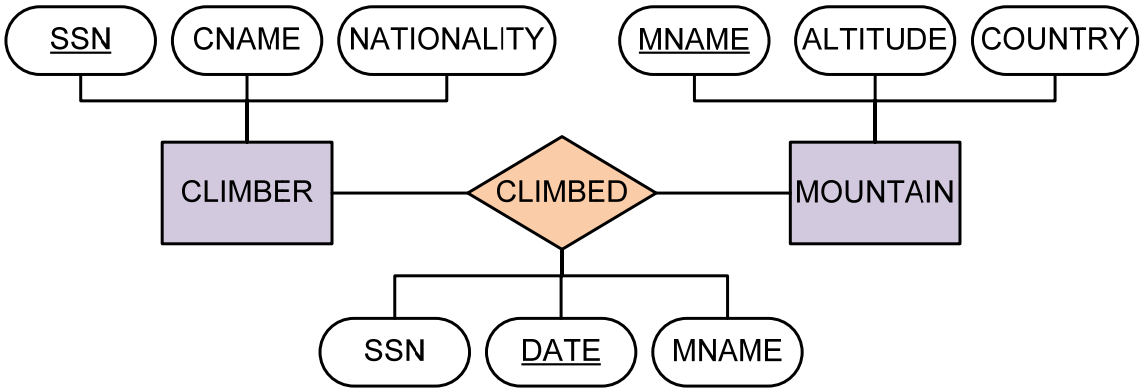
29.12.2009

S. 1.

a.



b.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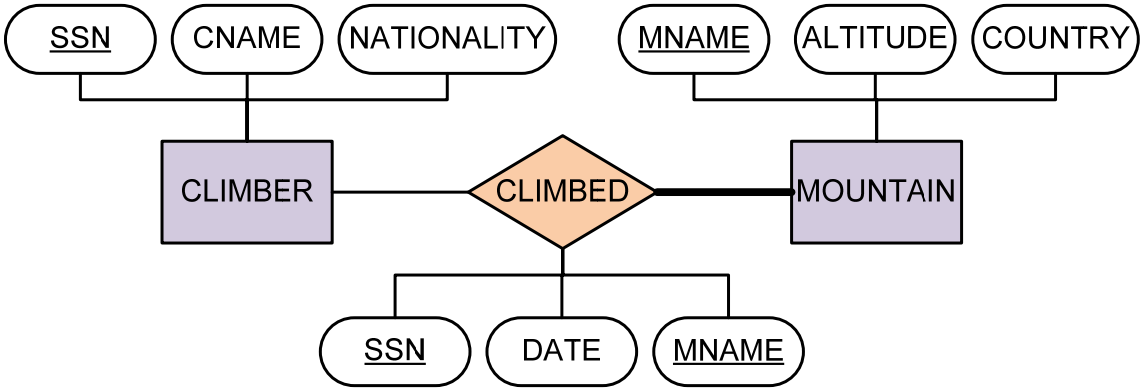
c.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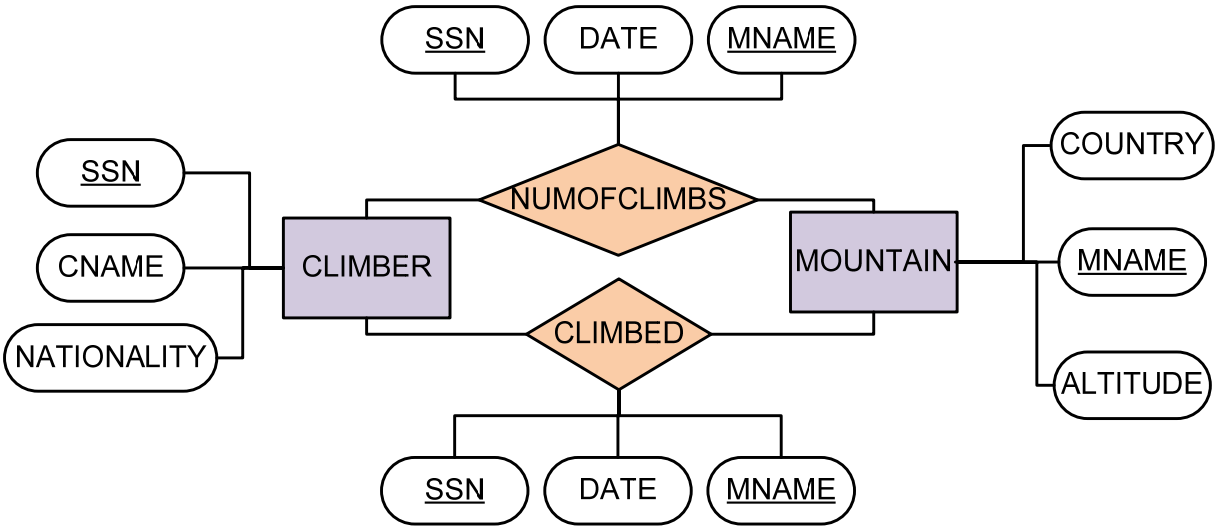
d.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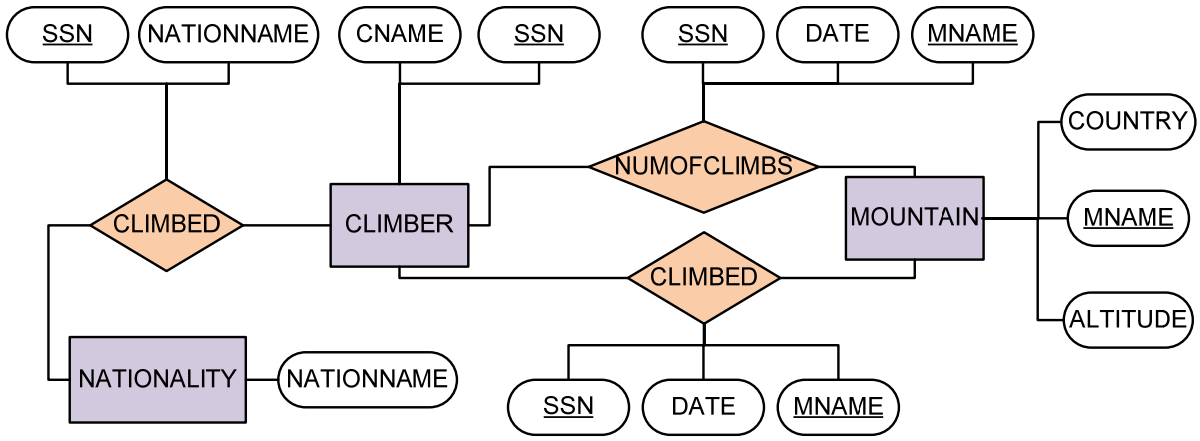
e.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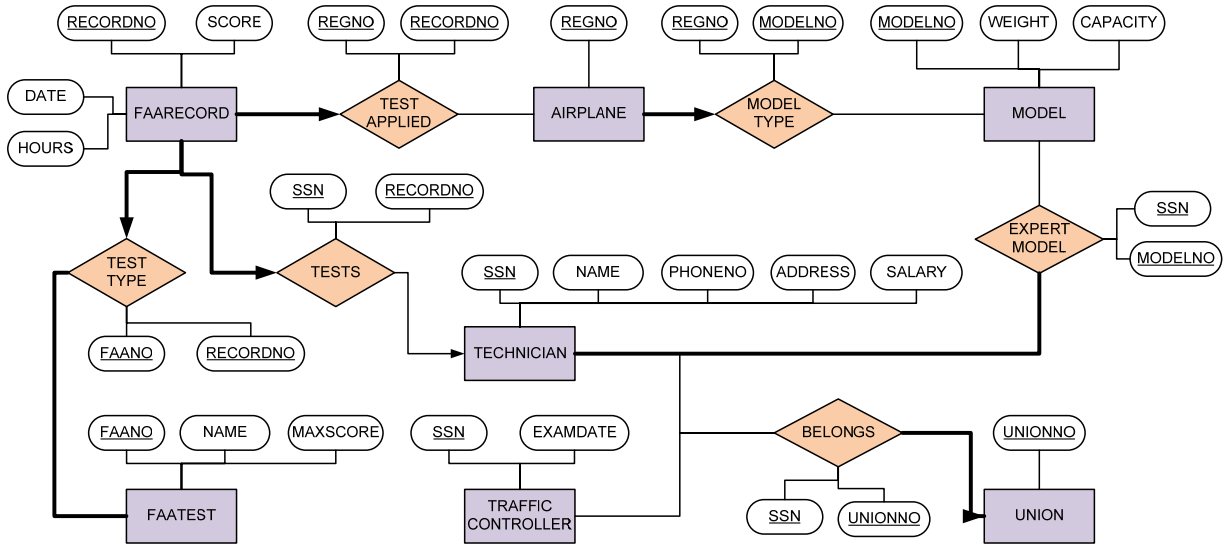
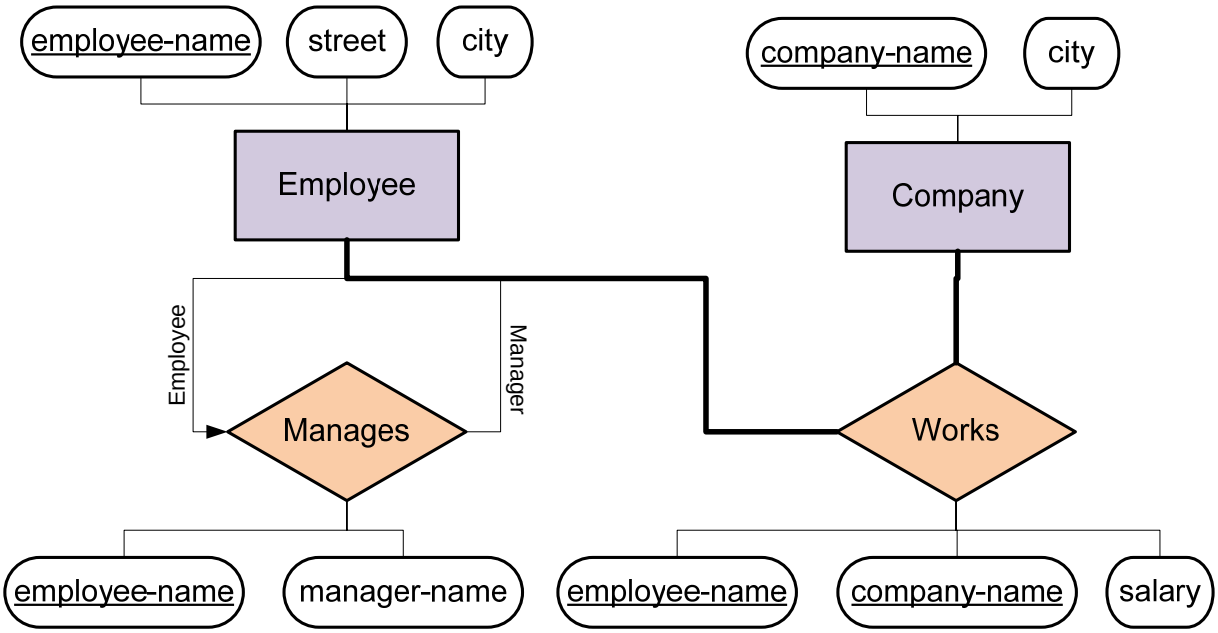
S. 2.



It is not possible to express that the tests on a plane must be conducted by a technician who is an expert on that model because the constraint is on the Entities. We can do this by dividing different expertise of technicians and the models but this would limit adding new models and expertise types of the technicians.

S. 3.



1. Employee's employee-name attribute is assumed as primary key.
2. Company's company-name attribute is assumed as primary key.
3. Employees' should work in at least one company.
4. Companys' should have at least one Employee.
5. Employees' can have at most one manager.

S. 4.

a) $\pi_{\text{employee-name}}\ (\sigma_{\text{company-name = “Microsoft”}}\ (\text{Works}))$

b) $\pi_{\text{employee-name, city}}\ (\text{Employee} \bowtie (\sigma_{\text{company-name = “Microsoft”}}\ (\text{Works})))$

c) $\pi_{\text{employee-name, street, city}}\ (\ \sigma(\ \text{company-name = “Microsoft”} \wedge \text{salary > “10000”})\ (\text{Works} \bowtie \text{Employee}))$

d) $\pi_{\text{employee-name, employee-name}}(\sigma_{\text{company-name = company-name}}\ (\text{Works x Works}))$

e) $\pi_{\text{employee-name}}(\text{Employee} \bowtie \text{Works} \bowtie \text{Company})$

f) $\pi_{\text{employee-name}}((\text{Employee} \bowtie \text{MANAGES}) \bowtie_{\text{(manager-name = employee2.employee-name} \wedge \text{employee.street = employee2.street} \wedge \text{employee.city = employee2.city)}}\ (\rho_{\text{employee2}}(\text{Employee})))$

g) Based on the 3rd assumption that we have made in S.3. above;

$\pi_{\text{employee-name}}(\sigma_{\text{company-name} \neq \text{“First Bank Corporation”}}(\text{Works}))$

Otherwise, it would be;

$\pi_{\text{employee-name}}(\text{Employee}) - \pi_{\text{employee-name}}(\sigma_{\text{company-name = “First Bank Corporation”}}(\text{Works}))$

h) $\pi_{\text{employee-name}}(\text{Works}) - (\pi_{\text{Works.employee-name}}(\text{Works} \bowtie_{\text{(Works.salary} \leq \text{Works2.salary} \wedge \text{works2.company-name = “Small Bank Corporation”)}}\ \rho\text{Works2 (Works)}))$

i) $\pi_{\text{ompany-name}}(\text{Company} \div (\pi_{\text{City}}(\sigma_{\text{company-name = “Small Bank Corporation”}}(\text{Company}))))$

j) $\pi_{\text{employee-name}}((\text{Manages}) \bowtie_{\text{(Employee.employee-name = Manages.manager-name)}}(\text{Employee}) \bowtie_{\text{(company-name = “Microsoft”)}}(\text{Works}))$