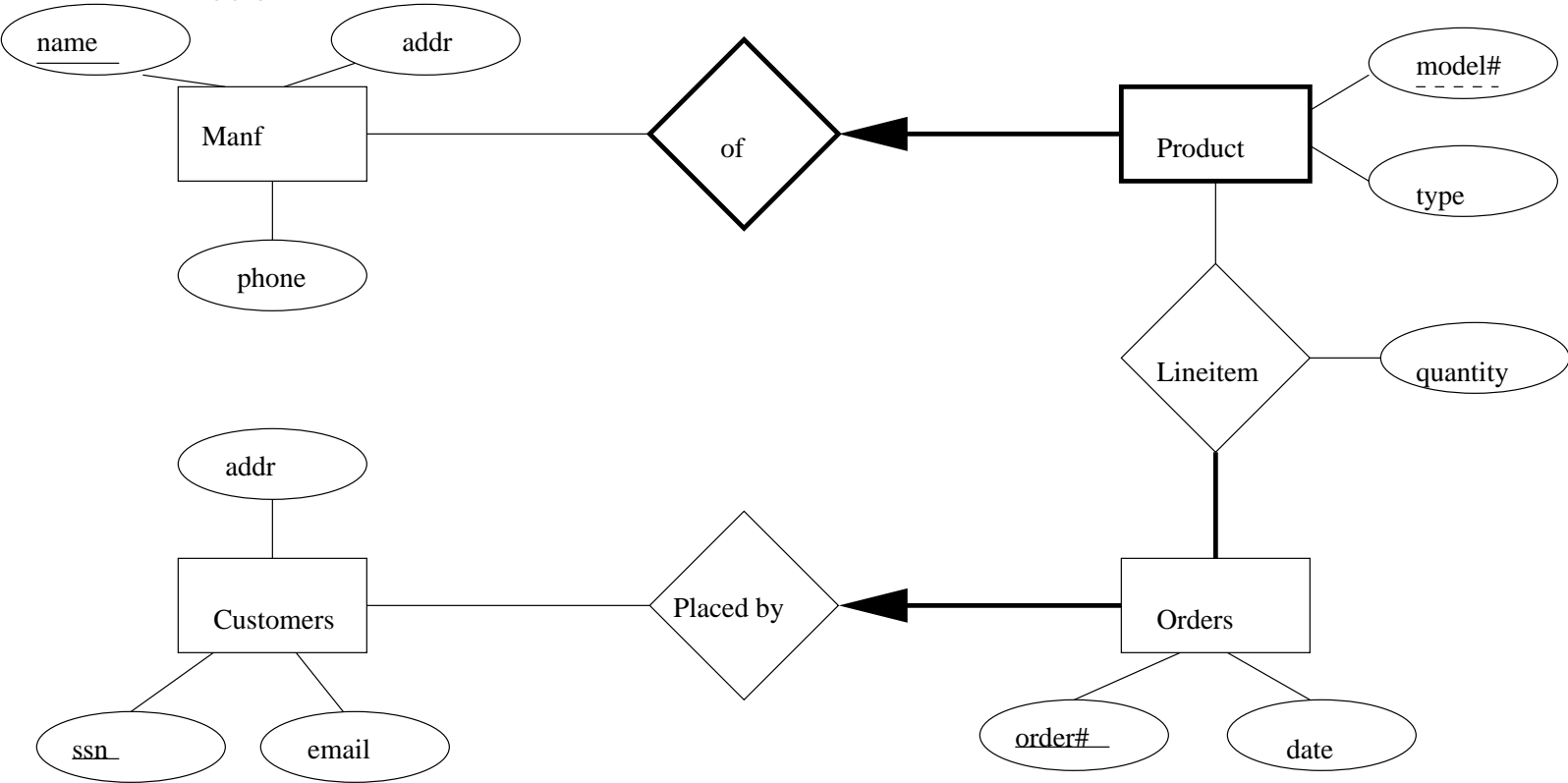


Problem 1



Manf(name, addr, phone)
Products(model#, type, name)
Orders(order#, date, ssn not null)
Customers(ssn, email, addr)
Lineitem(order#, name, model#, quantity)

Problem 2

(a) $\Pi_{type}(\sigma_{name='Lee'}(Accounts \bowtie Owns \bowtie Customers))$

(b) $\rho(A1, Accounts)$

$\rho(A2, Accounts)$

$\Pi_{type, balance}(Accounts) - \Pi_{A1.type, A1.balance}(\sigma_{A1.type=A2.type \text{ and } A1.balance < A2.balance}(A1 \times A2))$

(c) $\rho(R1, \Pi_{account_no}(Accounts) - \Pi_{account_no}(Owns))$

$\rho(R2, \Pi_{account_no}(Owns \bowtie Accounts) - \Pi_{account_no}(Owns \bowtie Customer))$

$R1 \cup R2$