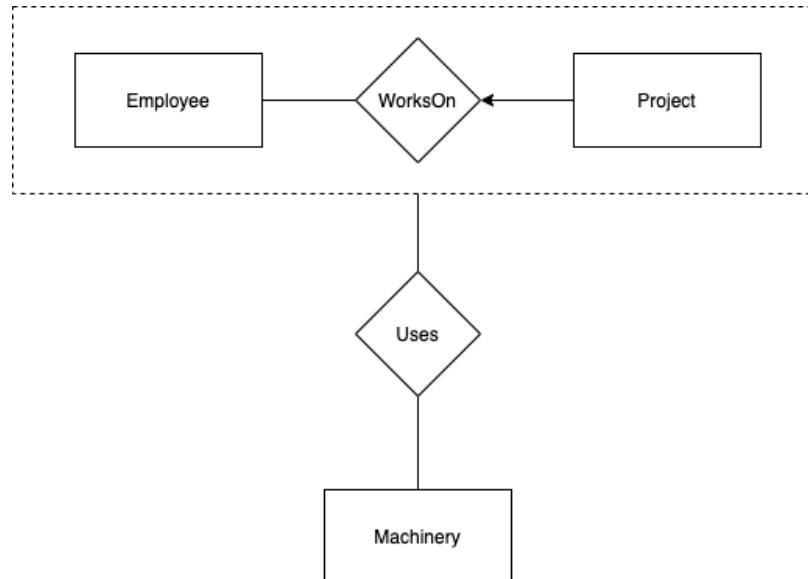
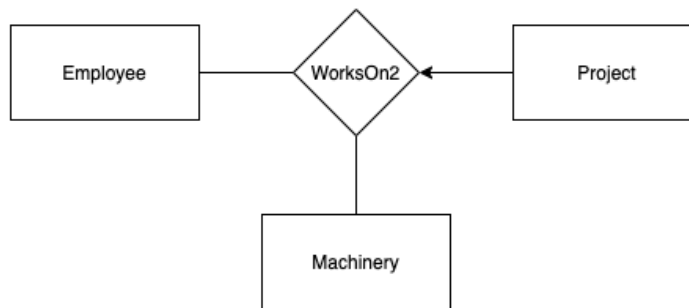


1. Consider the following E-R diagram with aggregation. Assume that we have identifiers like EID, PID, and MID. Suppose further that we don't want to create unnecessary tables.



- a) What is the primary key of the WorksOn relationship?
- b) How many projects can an employee work on?
- c) How many employees can work on a given project?
- d) What is the primary key of the ProjectWorks Aggregation?
- e) What is the purpose of the aggregation?
- f) What would be the primary key of the Uses relationship?
- g) Provide an example of two tuples that would violate the WorksOn relationship.
- h) Provide an example of two tuples that would satisfy the WorksOn relationship, and then provide an example of two or more tuples that would satisfy the Uses relationship.

2. Suppose we were to do all 3 of these things: remove the aggregation (and its dotted line), remove the Uses relationship, and just have Machinery go directly into WorksOn2 (to make a ternary relationship). The rest of the lines and arrow would remain, as is.



- What would be the primary key for the WorksOn2 ternary relationship?
 - Explain what the ternary relationship means, and what the arrow means.
 - Provide 3 tuples that would be valid for this ternary relationship.
 - Provide 2 pairs of tuples, where each pair would violate this ternary relationship in a different way.
3. Suppose in the aggregation of Question 1, the line from the Uses diamond goes directly to the Project entity—and *not* to the aggregation. Explain how this would change the business requirements (application). Suggest a potential use case.