Csc1203- Tutorial

Q1. Consider the following Production Company database schema, which keeps records of production machines, its operator and produced components. MachineNo and ComponenetNo make each product unique.

PRODUCTION(MachineNo, MachineType, OperatorName, { ComponenetNo, ComponentType })

Normalize the above relation to the 3NF, showing appropriate dependency diagrams to justify decomposition

UNF(because there is a repeating group – highlighted)

PRODUCTION (MachineNo, MachineType, OperatorName, { ComponenetNo, ComponentType })

1NF(remove the repeating group using Approach#1 - flattening' the table)

PRODUCTION (MachineNo, MachineType, OperatorName, ComponenetNo, ComponentType)

FDs:
FD1: MachineNo→MachineType, OperatorName (Partial Dependency)
FD2: ComponenetNo→ComponentType (Partial Dependency)
FD3: MachineNo, ComponenetNo→MachineType, OperatorName, ComponentType (PK)

2NF(FD1 and FD2 violates 2NF – Partial Dependencies)

PRODUCTION (MachineNo, ComponenetNo)
MACHINE (MachineNo, MachineType, OperatorName)
COMPONENT (ComponenetNo, ComponentType)

3NF(No violation because there is no Transitive dependency)

PRODUCTION (MachineNo, ComponenetNo)
MACHINE (MachineNo, MachineType, OperatorName)
COMPONENT (ComponenetNo, ComponentType)