Third Normal Form (3NF)

A table is in third normal form (3NF) if it is in 2NF and there is no transitive dependency that is no non-key attribute is dependent on another non-key attribute.

Example: Student Table

Roll no	Name	Department	Year	Hostel name
1784	Raman	Physic	1	Ganga
1648	Krishna	Chemistry	1	Ganga
1768	Gopalan	Mathematics	2	Kaveri
1848	Raja	Botany	2	Kaveri
1682	Maya	Geology	3	Krishna
1485	Singh	Zoology	4	Godavari

In above table Roll no is primary key and name, department, year and hostel name are non-key. Among non-key if we observe non-key year and non-key hostel name both are dependent on each other because 1 year student will get hostel Ganga and 2 year students will get hostel kaveri and 3 year students will get hostel Krishna and 4 year students will get hostel Godavari. So among year and hostel name, we clearly see transitive dependency. So in 3NF we have to remove transitive dependency.

Now break the table:

Student

Roll no	Name	Department	Year
1784	Raman	Physic	1
1648	Krishna	Chemistry	1
1768	Gopalan	Mathematics	2
1848	Raja	Botany	2
1682	Maya	Geology	3
1485	Singh	Zoology	4

Hostel

Year	Hostel name
1	Ganga
1	Ganga
2	Kaveri
2	Kaveri
3	Krishna
4	Godavari

So table is in 2NF as well as removed transitive dependency that is definition of 3NF.