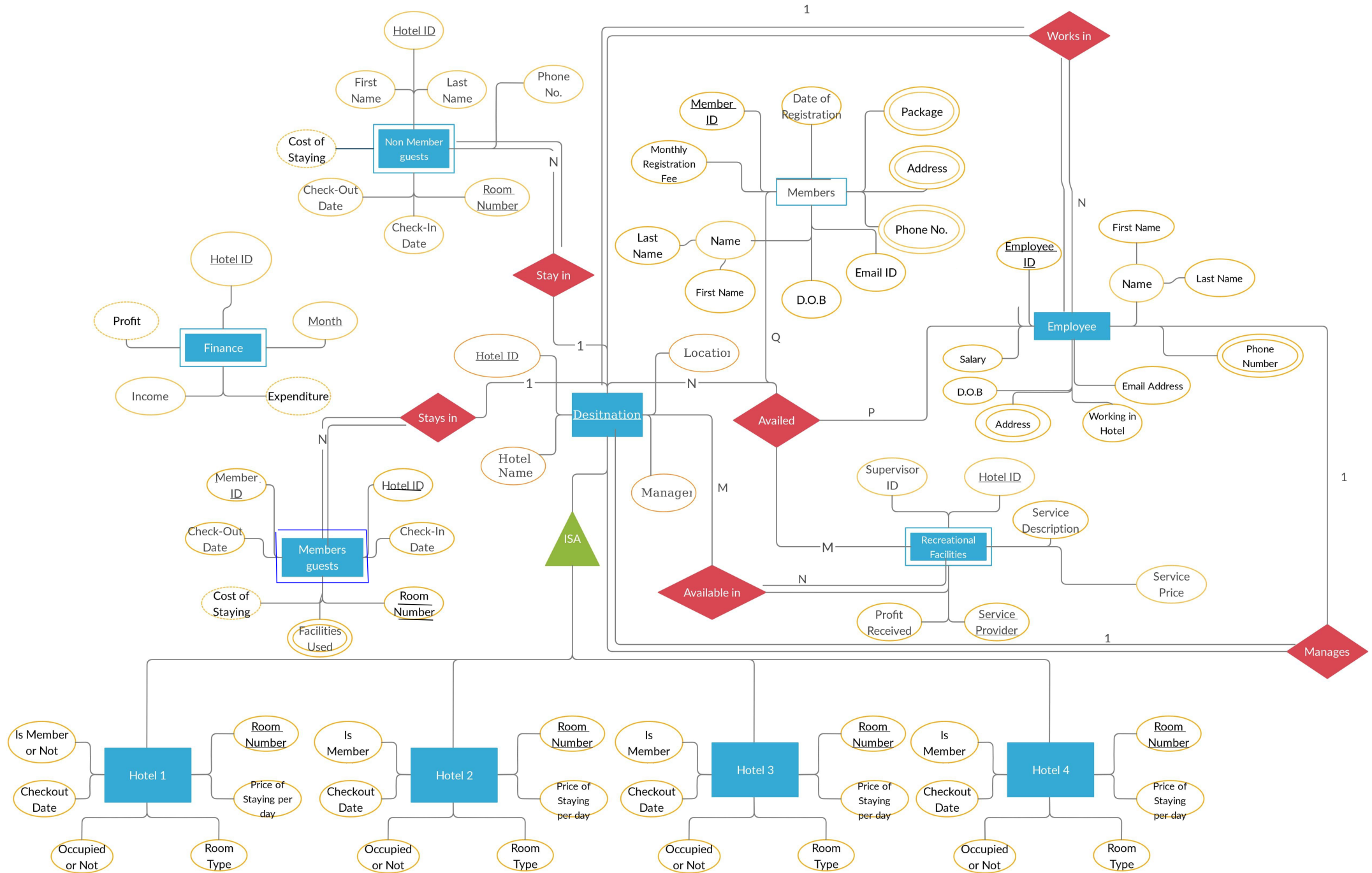


IMPROVED ER DIAGRAM



STEP WISE CONVERSION TO 3-NF

DESTINATION									
Hotel ID	Hotel Name	Location	Manager ID						
Changes : We don't have to make any changes in the above relation as there is no anomaly and it is in the normalized form.									
MEMBERS									
Member ID	First Name	Last Name	Date of Reg	DOB	Email ID	Monthly Fee	Package	Address	Ph No.
Changes : The above relation needs to be normalized to 1NF as it contains some multivalued attributes like Packages, Address and Ph No.									
Members relation after decomposition :-									
Member ID	First Name	Last Name	Date of Reg	DOB	Email ID	Monthly Fee			
(i) Member_Package	Member ID	Package							
(ii) Member_Address	Member ID	Address							
(iii) Member_Phone	Member ID	Ph No.							
FINANCE									
Hotel ID	Expenditure	Income	Month	Profit					
Changes : We don't have to make any changes in the above relation as there is no anomaly and it is in normalized form.									
MEMBER GUESTS									
Hotel ID	Room Number	Member ID	Check-In Date	Check-Out Date	Cost of Staying	Recreational Facility			
Changes : Above relation needs to be normalized to 1NF as it contains a multivalued attribute Recreational Facility, which is included in the N-ary relation. This is taken care of in the relation - FACILITIES AVAILABLE									
After Decomposition:-									
Hotel ID	Room Number	Member ID	Check-In Date	Check-Out Date					
NON-MEMBER GUESTS									
Hotel ID	Room Number	First Name	Last Name	Check-In-Date	Check-Out-Date	Cost of Staying	Phone Number		
Changes : We don't have to make any changes in the above relation as there is no anomaly and it is normalized.									
EMPLOYEE									
Employee ID	Manager ID	Salary	DOB	Hotel ID	Email ID	First Name	Last Name	Address	Phone Number
Changes : Above relation needs to be normalized to 1NF as it contains some multivalued attributes like Address and Phone Number									
Employee ID	Manager ID	Salary	DOB	Hotel ID	Email ID	First Name	Last Name		
(i) Employee_Address	Employee ID	Address							
(ii) Employee_Phone	Employee ID	Phone Number							
RECREATION									
Hotel ID	Service Provider	Supervisor	Profit	Service Description	Service Price				
Changes : Above relation needs to be normalized to 2NF. Here the attribute Service Description is functionally dependent on the attribute Service Provider. This must not exist in the 2NF. Hence after decomposition of the relation, the new relation becomes as follows:									

	Hotel ID	Service Provider	Supervisor ID	Profit						
(i) Providers_Services	Service Provider	Service Description	Service Price							
	HOTEL i (SUBCLASS)									
	isMember	isOccupied	Room Type	Price/Day	Room Number	Hotel ID				
	Changes :	We don't have to make any changes in the above relation as there is no anomaly and it is normalized.								
		Here, the attribute "checkout date" has been omitted since it is already stored in the guests relations.								
	FACILITIES AVAILED (N-ary relation)									
	Member ID	Service Provider	Number of times							

FINAL RELATIONAL MODEL

DESTINATION

<u>Hotel ID</u>	Hotel Name	Location	Manager ID
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MEMBERS

<u>Member ID</u>	First Name	Last Name	Date of Reg	DOB	Email ID	Monthly Fee
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(i) Member_Package

<u>Member ID</u>	Package
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(ii) Member_Address

<u>Member ID</u>	Address
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(iii) Member_Phone

<u>Member ID</u>	Ph No.
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FINANCE

<u>Hotel ID</u>	Expenditure	Income	<u>Month</u>	Profit
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MEMBER GUESTS

<u>Hotel ID</u>	<u>Room Number</u>	<u>Member ID</u>	Check-In Date	Check-Out Date	Cost of Staying
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NON-MEMBER GUESTS

<u>Hotel ID (Foreign Key)</u>	<u>Room Number</u>	First Name	Last Name	Check-In-Date	Check-Out-Date	Cost of Staying	Phone Number
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EMPLOYEE

<u>Employee ID</u>	Salary	DOB	<u>Hotel ID (Foreign Key)</u>	Email ID	First Name	Last Name
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(i) Employee_Address

<u>Employee ID</u>	Address
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(ii) Employee_Phone

<u>Employee ID</u>	Phone Number
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RECREATION

<u>Hotel ID</u>	<u>Service Provider</u>	Supervisor ID	Profit
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(i) Providers_Services

<u>Service Provider</u>	Service Description	Service Price
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HOTEL i (SUBCLASS)

isMember	isOccupied	Room Type	Price/Day	<u>Room Number</u>	<u>Hotel ID</u>
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FACILITIES AVAILED

<u>Member ID</u>	<u>Service Provider</u>	Number of times
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EXAMPLE TUPLES

DESTINATION

Hotel ID	Hotel Name	Location	Manager ID
1	Whitefields	Rangree, Manali, Himachal Pradesh, 175131	2
2	Exotic Stay	Plot F 8,Tiswadi, Panjim,Bainguinim, Goa, 403110	1
3	Palm Springs	3rd Street, Raj Lane, Podicherry	7
4	Mountain View	118,Jalaroad,Shimla	6

MEMBERS

Member ID	First Name	Last Name	Date of Reg	DOB	Email ID	Monthly Fee
1	Raj	Dewan	18/01/2017	19/02/1988	raj.dewan@gmail.com	500
2	Yaseen	Hafsh	29/11/2001	14/02/1988	yas.h@yahoo.com	330

(i) Member_Package

Member ID	Package
1	Red
1	Blue
2	Green

(ii) Member_Address

Member ID	Address
1	C 29, Part 2, South Extn, Bangalore, India-412932
2	Flat No. 100,Triveni Apartments, itam Pura, India-411002
2	Ispat Bhavan, Lodhi Road, Bikaner, India-411057

(iii) Member_Phone

Member ID	Ph No.
1	9932394392
1	7023143824
2	9328348283

FINANCE

Hotel ID	Expenditure	Income	Month	Profit
1	1000000	2000000	July	1000000
2	1000000	2100000	July	1000000

MEMBER GUESTS

Hotel ID (Foreign Key)	Room Number	Member ID	Check-In Date	Check-Out Date	Cost of Staying
1	2	2	18/12/2019	28/12/2019	5000
2	2	1	13/12/2019	20/12/2019	5600

NON-MEMBER GUESTS

Hotel ID (Foreign Key)	Room Number	First Name	Last Name	Check-In-Date	Check-Out-Date	Cost of Staying	Phone Number
1	1	Manish	Mamma	18/12/2019	26/12/2019	9600	9123219231

EMPLOYEE

Employee ID	Salary	DOB	Hotel ID (Foreign Key)	Email ID	First Name	Last Name
1	20000	14/02/1988	2	abc@gmail.com	A	B
2	50000	14/02/1988	1	def@gmail.com	X	Y
3	30000	14/02/1988	1	pqr@gmail.com	C	D
4	25000	19/02/1988	2	xyz@gmail.com	E	F
5	70000	19/02/1988	2	qwe@gmail.com	G	H
6	45000	19/02/1988	4	rty@gmail.com	K	L
7	27000	19/02/1988	3	lmn@gmail.com	M	N

(i) Employee_Address	Employee ID	Address				
	1	Noida Delhi				
	2	Banglore, Kamataka				
	3	Banglore, Kamataka				
	3	Chennai, Tamil Nadu				
	4	Pune, Maharashtra				
	5	Madurai, Tamil Nadu				
	6	Mumbai, Maharashtra				
	7	Hyderabad, Telangana				
(ii) Employee_Phone	Employee ID	Phone Number				
	1	9273183746				
	2	8234567891				
	3	7634566666				
	4	9292929292				
	4	8282828282				
	5	9123929123				
	6	7131313131				
	7	8237465748				
RECREATION						
	Hotel ID	Service Provider	Supervisor ID	Profit		
	1	Ching Ma	3	500		
	1	Udipi	2	1000		
	2	Ching Ma	5	500		
(i) Providers_Services	Service Provider	Service Description	Service Price			
	Ching Ma	Chinese Restaurant	123			
	Udipi	South Indian Restaurant	23			
HOTEL i (SUBCLASS)						
	isMember	isOccupied	Room Type	Price/Day	Room Number	Hotel ID *
	FALSE	TRUE	Studio	300	1	1
	TRUE	TRUE	Duplex	500	2	1
	NULL	FALSE	Studio	500	1	2
	TRUE	TRUE	Duplex	800	2	2
FACILITIES AVAILABLE						
	Member ID	Service Provider	Number of times			
	1	Ching Ma	2			
	2	Ching Ma	1			

ASSUMPTIONS AND CHANGES:

1. Phone Number for MEMBERS changed to Multivalued
2. Phone Number added to NON-MEMBER GUESTS and EMPLOYEES.
3. Phone Number is multivalued for EMPLOYEES.
4. MANAGES relation added between DESTINATION and EMPLOYEES.
5. N-ARY AVAILED relation added.
6. Attribute SERVICE PRICE added to RECREATIONAL FACILITIES.
7. Attribute ADDRESS is made multivalued for EMPLOYEE.
8. MEMBER-GUESTS was made a weak entity, under the assumption that multiple rooms can be booked by the same Member ID.
9. Manager ID is not required in the employee table as it is already an attribute of DESTINATION.
10. Each DESTINATION has a single unique manager.