



Department of Computer Engineering

**CSE5041 Database Design & Development
Project Report**

Yacht Club Database

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1 INTRODUCTION

1.1 PROJECT DESCRIPTION

The Yacht Club Database stores information about the employees, the club members, the yachts and the social facilities of the club. The following data have been identified in the requirements collection and analysis phase and they are to be represented in the enterprise:

- The club members each have a unique yacht, unique identification number and personal information. The database keeps track of the number of both club members and yachts.
- Each yacht has a class and type of its own. Each yacht model also has a brand, hull type and engine brand. From this list we can see all sort of brands on both yachts and their engines.
- The database stores each employee's name, social security number, birthdate, for how many hours and on which social facility they work.. An employee can be assigned to multiple facilities.. The database also keeps track of the number of employees.
- For insurance purposes, the database keeps track of the yachts of each club member. Each club member's name, contacts and birthdate is recorded in the database.

2 ENTITY RELATIONAL MODEL

2.1 ENHANCED ER DIAGRAM

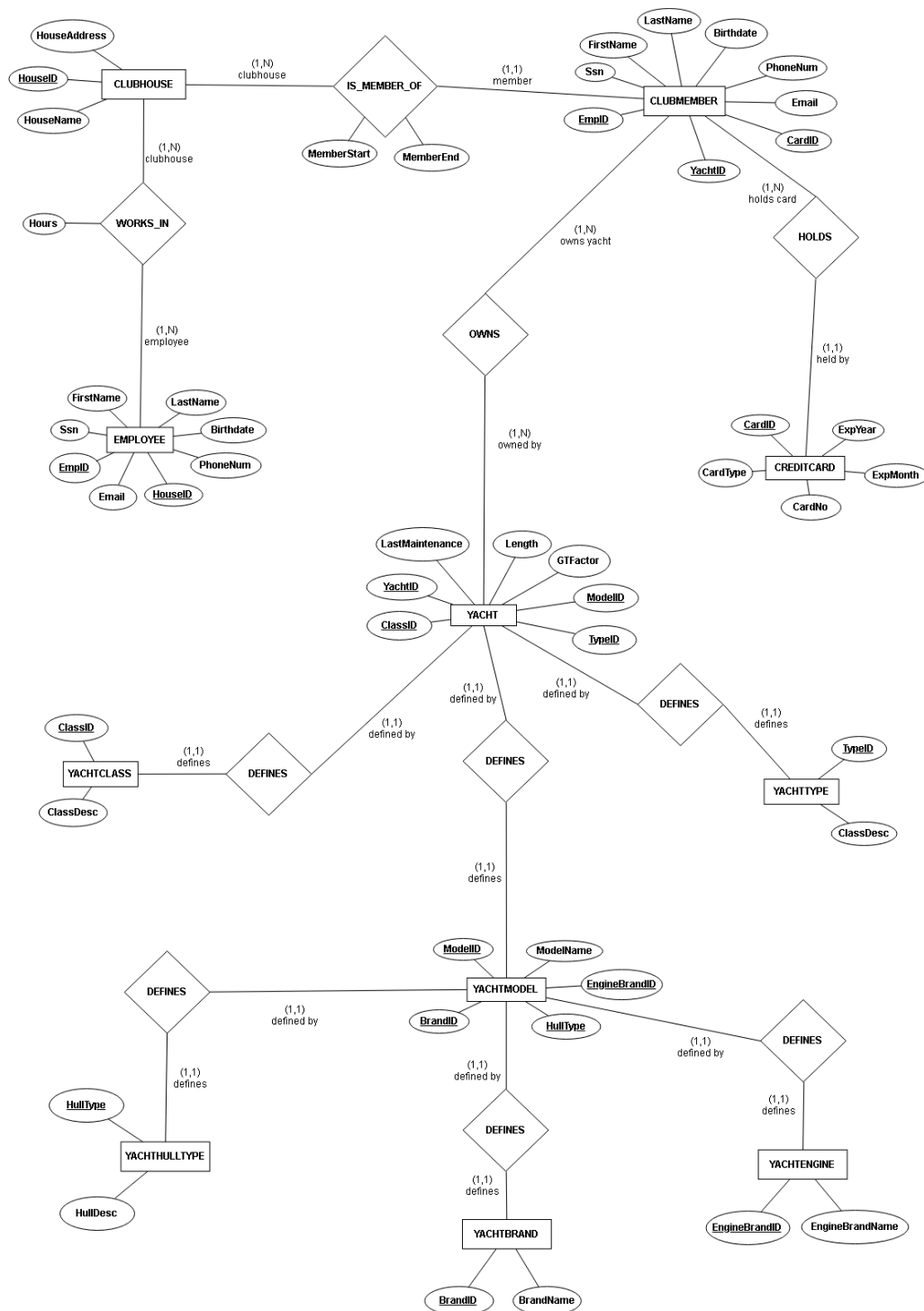


Figure 1: EER diagram of the Yacht Club Database

2.2 RELATIONAL SCHEMA & MAPPING

Employee

<u>EmployeeID</u>	Ssn	FName	LName	BDate	Email	Phone
int	nvarchar(11)	nvarchar(50)	nvarchar(50)	date	nvarchar(50)	int

ClubMember

<u>MemberID</u>	Ssn	FName	LName	BDate	Email	Phone	YachtID	CardID
int	nvarchar(11)	nvarchar(50)	nvarchar(50)	date	nvarchar(50)	int	int	int

Yacht

<u>YachtID</u>	ClassID	TypeID	ModelID	GTFactor	Length	LastMaintenance
int	int	int	int	float	float	date

YachtClass

<u>ClassID</u>	ClassDesc
int	nvarchar(50)

YachtType

<u>TypeID</u>	TypeDesc
int	nvarchar(50)

YachtModel

<u>ModelID</u>	BrandID	ModelName	HullType	EngineBrand
int	int	nvarchar(50)	int	int

YachtBrand

<u>BrandID</u>	BrandName
int	nvarchar(50)

YachtHullType

<u>HullType</u>	HullDesc
int	nvarchar(50)

YachtEngine

<u>EngineBrand</u>	EngineBrandName
int	nvarchar(50)

CreditCard

<u>CardID</u>	CardType	CardNo	ExpMonth	ExpYear
int	nvarchar(50)	nvarchar(20)	int	int

ClubHouse

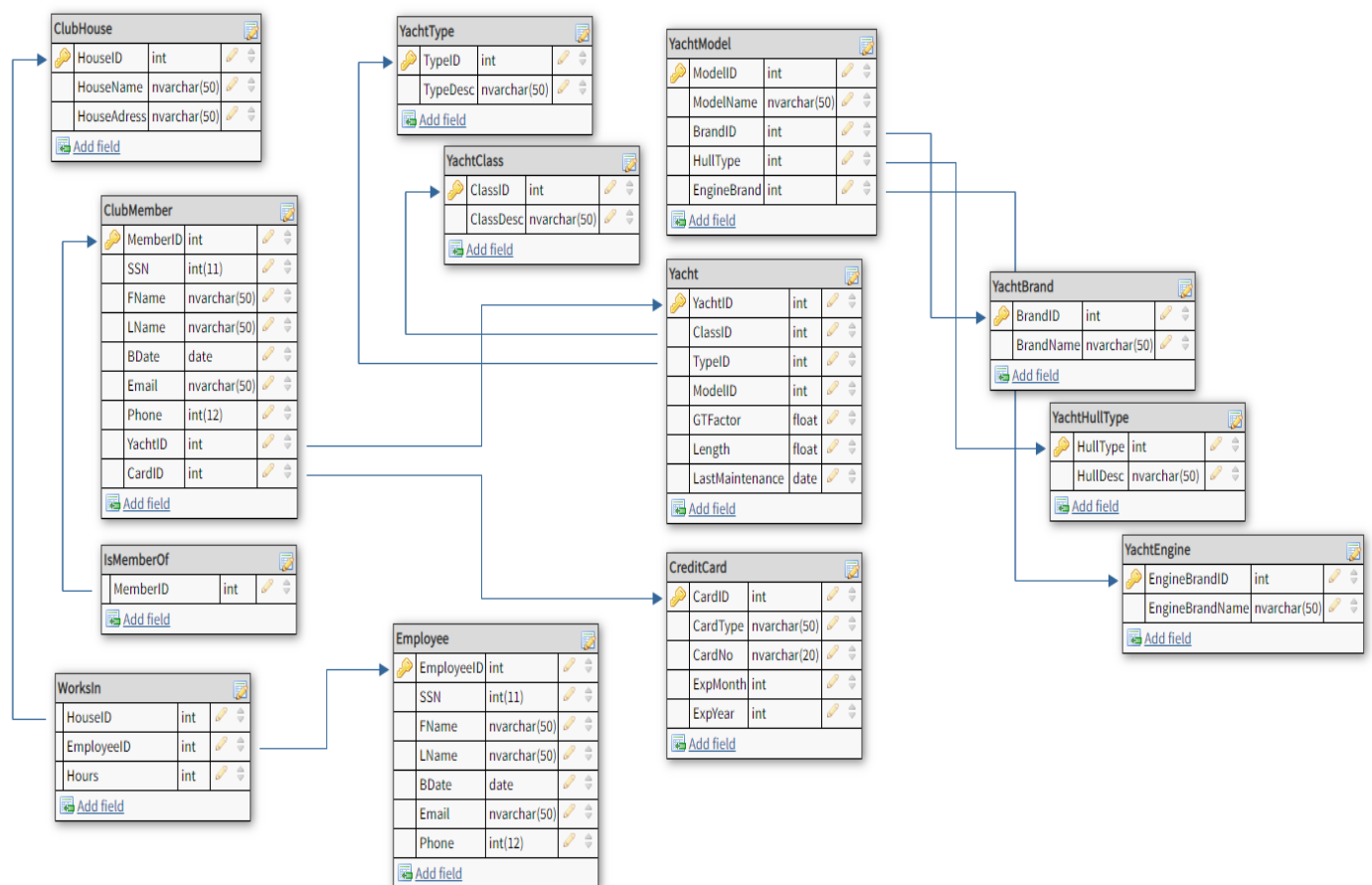
<u>HouseID</u>	HouseName	HouseAddress
int	nvarchar(50)	nvarchar(50)

WorksIn

EmployeeID	HouseID	Hours
int	int	int

IsMemberOf

MemberID	MemberStart	MemberEnd
int	date	date

**Figure 2:** Relationship integrity of the Yacht Club Database

3 NORMALIZATION

3.1 FUNCTIONAL DEPENDENCIES

EmployeeID -> Ssn, FName, LName, BDate, Email, Phone

MemberID -> SSN, FName, Lname, Bdate, Email, Phone, YachtID, CardID

YachtID -> ClassID, TypeID, ModelID, Gtfactor, Lenght, LastMaintenance

ClassID -> ClassDesc

TypeID -> TypeDesc

ModelID -> BrandID, ModelName, HullType, EngineBrand

CardID -> CardType, CardNo, ExpMonth, ExpYear

HouseID -> HouseName, HouseAdress

BrandID -> BrandName

HullType -> HullDesc

EngineBrand -> EnginBrandName

3.2 UNNORMALISED FORM

3.3 FIRST NORMAL FORM

For first normal form:

Each table cell should contain a single value.

Each record needs to be unique.

Thus, **All tables** are in first normal form.

3.4 SECOND NORMAL FORM

For second normal form:

Be in first normal form.

Single Column Primary Key

Thus, **All tables** are second normal form.

3.5 THIRD NORMAL FORM

For third normal form:

Be in second normal form.

Has no transitive functional dependencies.

Thus, Tables named **YachtModel**, **YachtClass**, **YachtHullType**, **YachtType** are in 3NF.