



UNIVERSIDAD DE MÁLAGA



BIG DATA
ADVANCED ANALYTICS

RELATIONAL MODEL

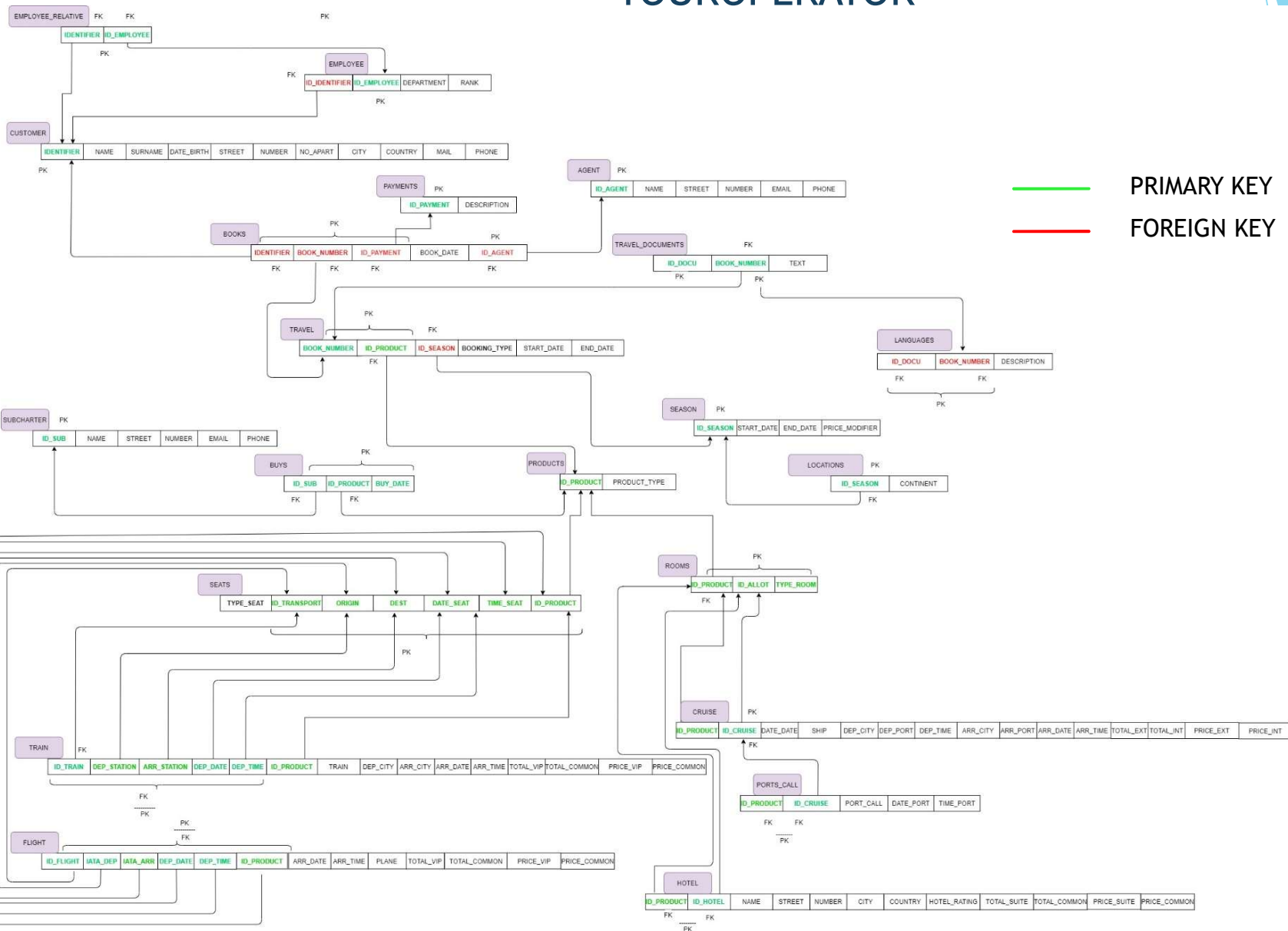
TOUROPERATOR

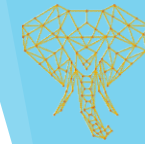
FERNANDO MUÑOZ RAMIREZ

RUBÉN NAVARRO TRUJILLO

INMACULADA VALERO FRIAS

RELATIONAL MODEL TOUROperator





Employee_Relative

PK -> Identifier, ID_Employee

FK -> Identifier, ID_Employee

Employee

PK -> ID_Employee

FK -> ID_Identifier

Customer

PK -> Identifier

Agents

PK -> ID_Agent

Books

PK -> Identifier, Book_number, ID_Payment,
ID_Agent

FK -> Identifier, Book_number, ID_Payment,
ID_Agent

Payments

PK -> ID_Payment

Travel

PK -> Book_number, ID_Prodcut

FK -> ID_Product, ID_Season, Booking_type

Travel_Documents

PK -> Book_number, ID_Docu

FK -> Book_Number

Languages

PK -> ID_Docu, Book_Number

FK -> ID_Docu, Book_Number

Product

PK -> ID_Prodcut

Season

PK -> ID_Prodcut

Locations

PK -> ID_Season

FK -> ID_Season



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Buys

PK -> ID_Prodcut, ID_Sub, Buy_Date

FK -> ID_Prodcut, ID_Sub

Subcharter

PK -> ID_Sub

Seats

PK -> Type_Seat, ID_Transport, Origin_Dest, Date_Seat, Time_Seat, ID_Product

Train

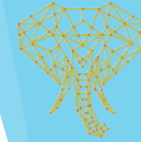
PK -> ID_Train, Dep_Station, Arr_Station, Dep_Date, Dep_Time, ID_Product

FK -> ID_Train, Dep_Station, Arr_Station, Dep_Date, Dep_Time, ID_Product

Flight

PK -> ID_Flight, lata_Dep, lata_Arr, Dep_Date, Dep_Time, ID_Prodcut

FK -> ID_Flight, lata_Dep, lata_Arr, Dep_Date, Dep_Time, ID_Prodcut



BIG DATA
ADVANCED ANALYTICS

Rooms

PK -> ID_Product, ID_Allot, Type_Room

FK -> ID_Product

Cruise

PK -> ID_Cruise, ID_Product

FK -> ID_Cruise, ID_Product

Hotel

PK -> ID_Hotel, ID_Product

FK -> ID_Hotel, ID_Produc

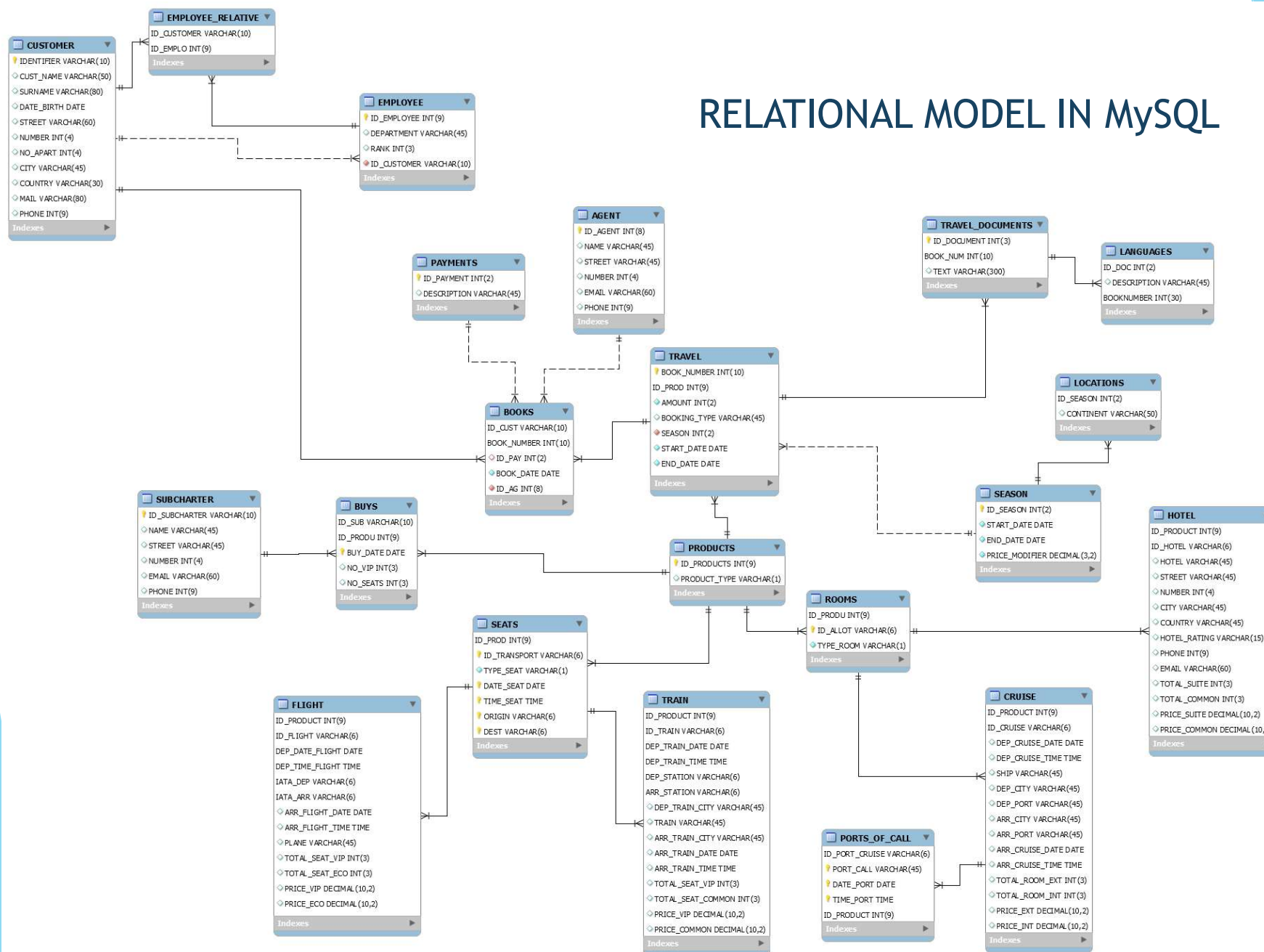
Port Calls

PK -> ID_Cruise, ID_Product

FK -> ID_Cruise, ID_Product



RELATIONAL MODEL IN MySQL





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THE SQL SCRIPT



BIG DATA
ADVANCED ANALYTICS

- Generate automatically the script importing the model using the reverse engineer to create a SQL script with the

```
NCIA* script_create_TouroperatorDB x Load Data Touroperator agent
-- MySQL Script generated by MySQL Workbench
-- Tue Jan 14 15:08:48 2020
-- Model: New Model Version: 1.0
-- MySQL Workbench Forward Engineering

SET @OLD_UNIQUE_CHECKS=@@UNIQUE_CHECKS, UNIQUE_CHECKS=0;
SET @OLD_FOREIGN_KEY_CHECKS=@@FOREIGN_KEY_CHECKS, FOREIGN_KEY_CHECKS=0;
SET @OLD_SQL_MODE=@@SQL_MODE, SQL_MODE='ONLY_FULL_GROUP_BY,STRICT_TRANS_TABLES,NO_ZERO_IN_DATE,NO_ZERO_DATE,ERROR_FOR_DIVISION_BY_ZERO,NO_ENGINE_SUBSTITUTION';

-- Schema touroperator
--
-- Table 'touroperator'. 'CUSTOMER'
--
CREATE TABLE IF NOT EXISTS `touroperator`.`CUSTOMER` (
  `IDENTIFIER` VARCHAR(10) NOT NULL,
  `CUST_NAME` VARCHAR(50) NULL,
  `SURNAME` VARCHAR(30) NULL,
  `DATE_BIRTH` DATE NULL,
  `STREET` VARCHAR(50) NULL,
  `NUMBER` INT(4) NULL,
  `NO_APART` INT(4) NULL,
  `CITY` VARCHAR(45) NULL,
  `COUNTRY` VARCHAR(30) NULL,
  `MAIL` VARCHAR(80) NULL,
  `PHONE` INT(9) NULL,
  PRIMARY KEY (`IDENTIFIER`))
ENGINE = InnoDB;

-- Table 'touroperator'. 'EMPLOYEE'
--
CREATE TABLE IF NOT EXISTS `touroperator`.`EMPLOYEE` (
  `ID_EMPLOYEE` INT(9) NOT NULL,
  `DEPARTMENT` VARCHAR(45) NULL,
  `RANK` INT(3) NULL,
  `ID_CUSTOMER` VARCHAR(10) NOT NULL,
  PRIMARY KEY (`ID_EMPLOYEE`),
  INDEX `FK_EMP_CUSTOMER_idx` (`ID_CUSTOMER` ASC) VISIBLE,
  CONSTRAINT `FK_EMP_CUSTOMER`
    FOREIGN KEY (`ID_CUSTOMER`)
      REFERENCES `touroperator`.`CUSTOMER` (`IDENTIFIER`)
        ON DELETE NO ACTION
        ON UPDATE NO ACTION)
ENGINE = InnoDB;

-- Table 'touroperator'. 'EMPLOYEE_RELATIVE'
--
CREATE TABLE IF NOT EXISTS `touroperator`.`EMPLOYEE_RELATIVE` (
  `ID_CUSTOMER` VARCHAR(10) NOT NULL,
  `ID_EMPLO` INT(9) NOT NULL,
  PRIMARY KEY (`ID_CUSTOMER`, `ID_EMPLO`),
  INDEX `FK_RELA_EMPLO_idx` (`ID_EMPLO` ASC) VISIBLE,
  CONSTRAINT `FK_EMP_REL_EMPLO`
    FOREIGN KEY (`ID_EMPLO`)
      REFERENCES `touroperator`.`EMPLOYEE` (`ID_EMPLOYEE`)
        ON DELETE NO ACTION
        ON UPDATE NO ACTION,
  CONSTRAINT `FK_EMP_REL_CUSTOM`
    FOREIGN KEY (`ID_CUSTOMER`)
      REFERENCES `touroperator`.`CUSTOMER` (`IDENTIFIER`)
        ON DELETE NO ACTION
        ON UPDATE NO ACTION)
ENGINE = InnoDB;

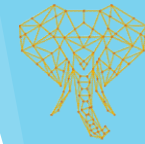
-- Table 'touroperator'. 'PAYMENTS'
--
CREATE TABLE IF NOT EXISTS `touroperator`.`PAYMENTS` (
  `ID_PAYMENT` INT(2) NOT NULL,
  `DESCRIPTION` VARCHAR(45) NULL,
  PRIMARY KEY (`ID_PAYMENT`))
ENGINE = InnoDB;

-- Table 'touroperator'. 'AGENT'
--
CREATE TABLE IF NOT EXISTS `touroperator`.`AGENT` (
  `ID_AGENT` INT(8) NOT NULL,
  `NAME` VARCHAR(45) NULL,
  `STREET` VARCHAR(45) NULL,
  `NUMBER` INT(4) NULL,
  `EMAIL` VARCHAR(60) NULL,
  `PHONE` INT(9) NULL,
  PRIMARY KEY (`ID_AGENT`))
ENGINE = InnoDB;

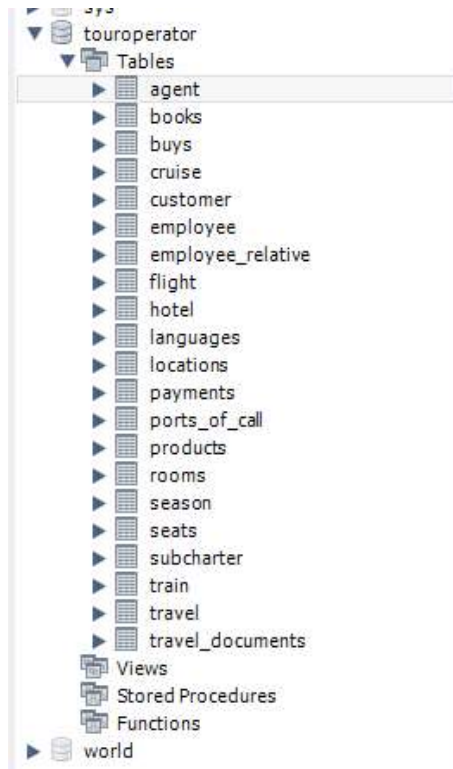
-- Table 'touroperator'. 'SEASON'
--
CREATE TABLE IF NOT EXISTS `touroperator`.`SEASON` (
  `ID_SEASON` INT(2) NOT NULL,
  `START_DATE` DATE NOT NULL,
  `END_DATE` DATE NOT NULL,
  `PRICE_MODIFIER` DECIMAL(3,2) NOT NULL,
  PRIMARY KEY (`ID_SEASON`))
ENGINE = InnoDB;

-- Table 'touroperator'. 'PRODUCTS'
--
CREATE TABLE IF NOT EXISTS `touroperator`.`PRODUCTS` (
  `ID_PRODUCTS` INT(9) NOT NULL,
  `PRODUCT_TYPE` VARCHAR(1) NULL,
  PRIMARY KEY (`ID_PRODUCTS`))
ENGINE = InnoDB;

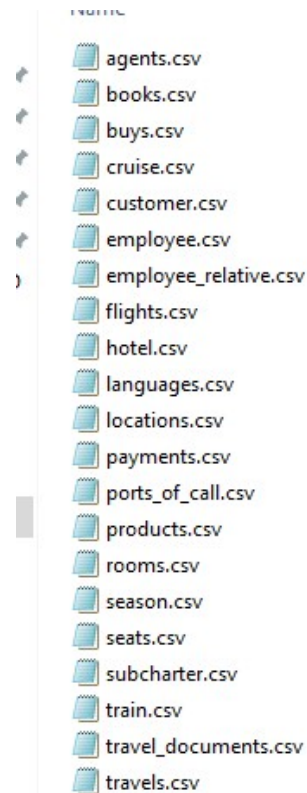
-- Table 'touroperator'. 'TRAVEL'
--
CREATE TABLE IF NOT EXISTS `touroperator`.`TRAVEL` (
  `BOOK_NUMBER` INT(10) NOT NULL,
  `ID_PROD` INT(9) NOT NULL,
  `AMOUNT` INT(2) NOT NULL,
  `BOOKING_TYPE` VARCHAR(45) NULL,
  `SEASON` INT(2) NOT NULL,
  `START_DATE` DATE NOT NULL,
  `END_DATE` DATE NOT NULL,
  PRIMARY KEY (`BOOK_NUMBER`, `ID_PROD`),
  INDEX `FK_TRA_SEASON_idx` (`SEASON` ASC) VISIBLE,
  INDEX `FK_TRA_PRODUCT_idx` (`ID_PROD` ASC) VISIBLE,
  CONSTRAINT `FK_TRA_SEASON`
    FOREIGN KEY (`SEASON`)
      REFERENCES `touroperator`.`SEASON` (`ID_SEASON`)
        ON DELETE NO ACTION
        ON UPDATE NO ACTION,
  CONSTRAINT `FK_TRA_PRODUCT`
    FOREIGN KEY (`ID_PROD`)
      REFERENCES `touroperator`.`PRODUCTS` (`ID_PRODUCTS`)
        ON DELETE NO ACTION
        ON UPDATE NO ACTION)
ENGINE = InnoDB;
```

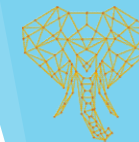



- Opening the script SQL Document and executing the code, the database is already created (without data).



- To check the relational model of our database we created a CSV file with data information invented by us:





- Load all data file.csv with the code following:

```
1 SET FOREIGN_KEY_CHECKS=0;
2
3 load data infile 'C:/ProgramData/MySQL/MySQL Server 8.0/Uploads/languages.csv'
4 INTO TABLE languages
5 FIELDS TERMINATED BY ';'
6 ENCLOSED BY '"'
7 LINES TERMINATED BY '\r\n'
8 IGNORE 1 LINES;
9
10 load data infile 'C:/ProgramData/MySQL/MySQL Server 8.0/Uploads/employee.csv'
11 INTO TABLE employee
12 FIELDS TERMINATED BY ';'
13 ENCLOSED BY '"'
14 LINES TERMINATED BY '\r\n'
15 IGNORE 1 LINES;
16
17 load data infile 'C:/ProgramData/MySQL/MySQL Server 8.0/Uploads/agents.csv'
18 INTO TABLE agent
19 FIELDS TERMINATED BY ';'
20 ENCLOSED BY '"'
21 LINES TERMINATED BY '\r\n'
22 IGNORE 1 LINES;
23
24 load data infile 'C:/ProgramData/MySQL/MySQL Server 8.0/Uploads/employee_relative.csv'
25 INTO TABLE employee_relative
26 FIELDS TERMINATED BY ';'
27 ENCLOSED BY '"'
28 LINES TERMINATED BY '\r\n'
29 IGNORE 1 LINES;
30
31 load data infile 'C:/ProgramData/MySQL/MySQL Server 8.0/Uploads/locations.csv'
32 INTO TABLE locations
33 FIELDS TERMINATED BY ';'
34 ENCLOSED BY '"'
35 LINES TERMINATED BY '\r\n'
36 IGNORE 1 LINES;
37
38 load data infile 'C:/ProgramData/MySQL/MySQL Server 8.0/Uploads/rooms.csv'
39 INTO TABLE rooms
40 FIELDS TERMINATED BY ';'
41 ENCLOSED BY '"'
42 LINES TERMINATED BY '\r\n'
43 IGNORE 1 LINES;
```

```
load data infile 'C:/ProgramData/MySQL/MySQL Server 8.0/Uploads/rooms.csv'
INTO TABLE rooms
FIELDS TERMINATED BY ';'
ENCLOSED BY '"'
LINES TERMINATED BY '\r\n'
IGNORE 1 LINES;

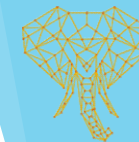
load data infile 'C:/ProgramData/MySQL/MySQL Server 8.0/Uploads/payments.csv'
INTO TABLE payments
FIELDS TERMINATED BY ';'
ENCLOSED BY '"'
LINES TERMINATED BY '\r\n'
IGNORE 1 LINES;

load data infile 'C:/ProgramData/MySQL/MySQL Server 8.0/Uploads/products.csv'
INTO TABLE products
FIELDS TERMINATED BY ';'
ENCLOSED BY '"'
LINES TERMINATED BY '\r\n'
IGNORE 1 LINES;

load data infile 'C:/ProgramData/MySQL/MySQL Server 8.0/Uploads/travel_documents.csv'
INTO TABLE travel_documents
FIELDS TERMINATED BY ';'
ENCLOSED BY '"'
LINES TERMINATED BY '\r\n'
IGNORE 1 LINES;

load data infile 'C:/ProgramData/MySQL/MySQL Server 8.0/Uploads/subcharter.csv'
INTO TABLE subcharter
FIELDS TERMINATED BY ';'
ENCLOSED BY '"'
LINES TERMINATED BY '\r\n'
IGNORE 1 LINES;

load data infile 'C:/ProgramData/MySQL/MySQL Server 8.0/Uploads/hotel.csv'
INTO TABLE hotel
FIELDS TERMINATED BY ';'
ENCLOSED BY '"'
LINES TERMINATED BY '\r\n'
IGNORE 1 LINES;
```

- Create the table of customer .
- Do that for each table of the Database.

SQL_DOCENCIA* script_create_TouroperatorDB Load Data Touroperator agent customer

Limit to 100 rows

```
1 • SELECT * FROM touroperator.customer;
```

Result Grid

IDENTIFIER	CUST_NAME	SURNAME	DATE_BIRTH	STREET	NUMBER	NO_APART	CITY	COUNTRY	MAIL	PHONE
020742605D	Malle	Short	1996-07-06	216-8783 Urna, Avenue	51	8	Uijeongbu	Reunion	purus.accumsan@sodalesMaurisblandit.org	406774129
161506187T	Clarke	Jacobson	1990-03-27	758-4105 Donec Av.	44	16	Pavone del Mella	Antarctica	sem@est.co.uk	138188526
162005237I	Geraldine	Castillo	1971-04-04	464-316 Lacinia Avenue	182	15	Tourinnes-Saint-Lambert	Mongolia	placerat.Cras.dictum@habitantmoribtristique.net	159565180
164204159P	Palmer	Compton	1988-02-13	3460 Niel St.	60	17	Falciano del Massico	Botswana	ultrices.adipiscing@sit.co.uk	905594681
164303298L	Kelly	McKinney	2004-05-06	4850 Quis, St.	116	19	Bonnyrigg	Andorra	metus@inconsectetuer.com	496774010
164410167Z	Chaney	Cannon	1977-08-10	Ap #505-8788 Nascetur Avenue	109	14	Southaven	Western Sahara	sit.amet.ante@blanditNam.org	444076244
164503117P	Zephyr	Deleon	2008-01-11	Ap #342-5875 Condimentum Av.	79	11	Dover	Nigeria	auctor.ullamcorper@sitametlorem.co.uk	158830889
164905081Q	Vernon	Whitaker	1991-06-13	2621 Nibh Avenue	57	12	Gujrat	Nicaragua	ante.dictum@utnisi.ca	653172880
166403213Z	Davis	Fowler	2005-10-01	Ap #488-802 Ante Road	188	19	Graven Grez-Doiceau	Ireland	eleifend@inceptos.ca	304411629
166604024H	Burton	Mccall	1994-03-19	8801 Vitae Av.	91	15	Millesimo	Ecuador	faucibus.ut.nulla@maurissipsumporta.org	825645500
166802085G	Rama	Roth	1988-09-05	504-4786 Dignissim Rd.	134	11	Adelaide	Costa Rica	purus.accumsan@atortorNunc.org	740219592
166908205B	Boris	Burnett	1986-08-31	P.O. Box 863, 7075 A Avenue	67	5	Recoleta	Algeria	ligula@psumdolorsit.net	132882498

customer 1 x



Seats table

SQL_DOCENCIA* script_create_TouroperatorDB Load Data Touroperator agent customer **seats**

1 • `SELECT * FROM touroperator.seats;`

Result Grid Filter Rows: Edit: Export/Import: Wrap Cell Content:

ID_PROD	ID_TRANSPORT	TYPE_SEAT	DATE_SEAT	TIME_SEAT	ORIGIN	DEST
100000110	AZ1010	V	2019-01-11	08:00:00	AGP	BRU
100000111	AZ1011	V	2019-01-12	08:30:00	BRU	OST
100000112	AZ1012	V	2019-01-13	12:00:00	OST	AGP
100000113	AZ1013	V	2019-01-14	15:00:00	TFS	CDG
100000114	AZ1014	V	2019-01-15	16:40:00	ALC	BRU
100000115	AZ1015	V	2019-01-16	17:10:00	BRU	ALC
100000116	AZ1016	V	2019-01-17	20:30:00	AGP	BRU
100000117	AZ1017	V	2019-01-18	22:00:00	BRU	OST
100000118	AZ1018	V	2019-01-19	08:00:00	OST	AGP
100000119	AZ1019	V	2019-01-20	08:30:00	TFS	CDG
100000120	AZ1020	V	2019-01-21	12:00:00	ALC	BRU
100000121	AZ1021	V	2019-01-22	15:00:00	BRU	ALC
100000122	AZ1022	V	2019-01-23	16:40:00	AGP	BRU
100000123	AZ1023	V	2019-01-24	17:10:00	BRU	OST
100000124	AZ1024	V	2019-01-25	20:30:00	OST	AGP
100000125	AZ1025	V	2019-01-26	22:00:00	TFS	CDG
100000126	AZ1026	V	2019-01-27	08:00:00	ALC	BRU
100000127	YM8506	V	2019-01-28	08:30:00	CDG	BEL
100000128	YM8507	V	2019-01-29	12:00:00	BEL	LIL
100000129	YM8508	V	2019-01-30	15:00:00	LIL	TFS
100000130	YM8509	V	2019-01-31	16:40:00	CUN	BRU
100000131	YM8510	V	2019-02-01	17:10:00	BRU	MIA
100000132	YM8511	V	2019-02-02	20:30:00	CUN	MIA
100000133	YM8512	V	2019-02-03	22:00:00	BRU	LAX
100000134	YM8513	V	2019-02-04	08:00:00	CDG	BEL
100000135	YM8514	V	2019-02-05	08:30:00	BEL	LIL

seats 1 x

Rooms table

SQL_DOCENCIA* script_create_TouroperatorDB Load Data Touroperator rooms **rooms**

1 • `SELECT * FROM touroperator.rooms;`

Result Grid Filter Rows: Edit: Export/Import: Wrap Cell Content:

ID_PROD	ID_ALLOT	TYPE_ROOM
100001342	CR2001	V
100001343	CR2002	V
100001344	CR2003	V
100001345	CR2004	V
100001346	CR2005	V
100001347	CR2006	V
100001348	CR2007	V
100001349	CR2008	V
100001350	CR2009	V
100001351	CR2010	V
100001352	CR2001	E
100001353	CR2002	E
100001354	CR2003	E
100001355	CR2004	E
100001356	CR2005	E
100001357	CR2006	E
100001358	CR2007	E
100001359	CR2008	E
100001360	CR2009	E
100001361	CR2010	E
100001362	HT1001	V
100001363	HT1002	V
100001364	HT1003	V
100001365	HT1004	V
100001366	HT1005	V
100001367	HT1006	V

rooms 1 x