Database

1. การติดตั้งและการตั้งค่า MySQL Server (.pdf)

   1.1. คำสั่งติดตั้ง MySQLServer

   sudo apt update

   sudo apt install mysql-server

   sudo systemctl status mysql

   1.2. การตั้งค่าenvให้กับ docker เพื่อกำหนด my.cnf และตำแหน่งที่เก็บข้อมูลบนhost

```dockerfile
Dockerfile X        docker-compose.yml
Dockerfile > ...
1   FROM mysql
2   COPY ./scripts ./scripts
3   ENV  MYSQL_ROOT_PASSWORD=Newnismo_2001
4   EXPOSE 3306
```
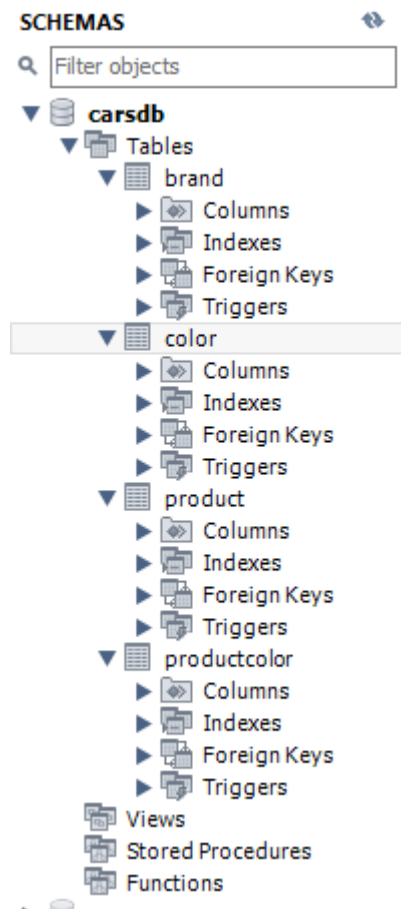
```yaml
Dockerfile        docker-compose.yml X
docker-compose.yml
1   version: '3'
2   services:
3     database:
4       container_name: database
5       build: .
6       image: database
7       environment:
8         MYSQL_ROOT_USER: root
9         MYSQL_ROOT_PASSWORD: Newnismo_2001
10        MYSQL_DATABASE: carsdb
11      volumes:
12        - "./scripts/carsdb.sql:/docker-entrypoint-initdb.d/carsdb.sql"
13        - "./scripts/user_grant.sql:/docker-entrypoint-initdb.d/user_grant.sql"
14      ports:
15        - "3306:3306"
16
17  networks:
18    default:
19        external:
20          name: allnetwork
```

```
projectcars@projectcars:~/database/INT221_Integrated_Project_Database$ ls -la
total 28
drwxrwxr-x 5 projectcars projectcars 4096 May  8 12:42  .
drwxrwxr-x 3 projectcars projectcars 4096 May  8 12:36  ..
drwxrwxr-x 8 projectcars projectcars 4096 May  8 12:42  .git
-rw-rw-r-- 1 projectcars projectcars   91 May  8 12:42  Dockerfile
-rw-rw-r-- 1 projectcars projectcars  429 May  8 12:42  docker-compose.yml
drwxrwxr-x 2 projectcars projectcars 4096 May  8 12:36  scripts
drwxrwxr-x 2 projectcars projectcars 4096 May  8 12:36 'scripts file'
projectcars@projectcars:~/database/INT221_Integrated_Project_Database$
```
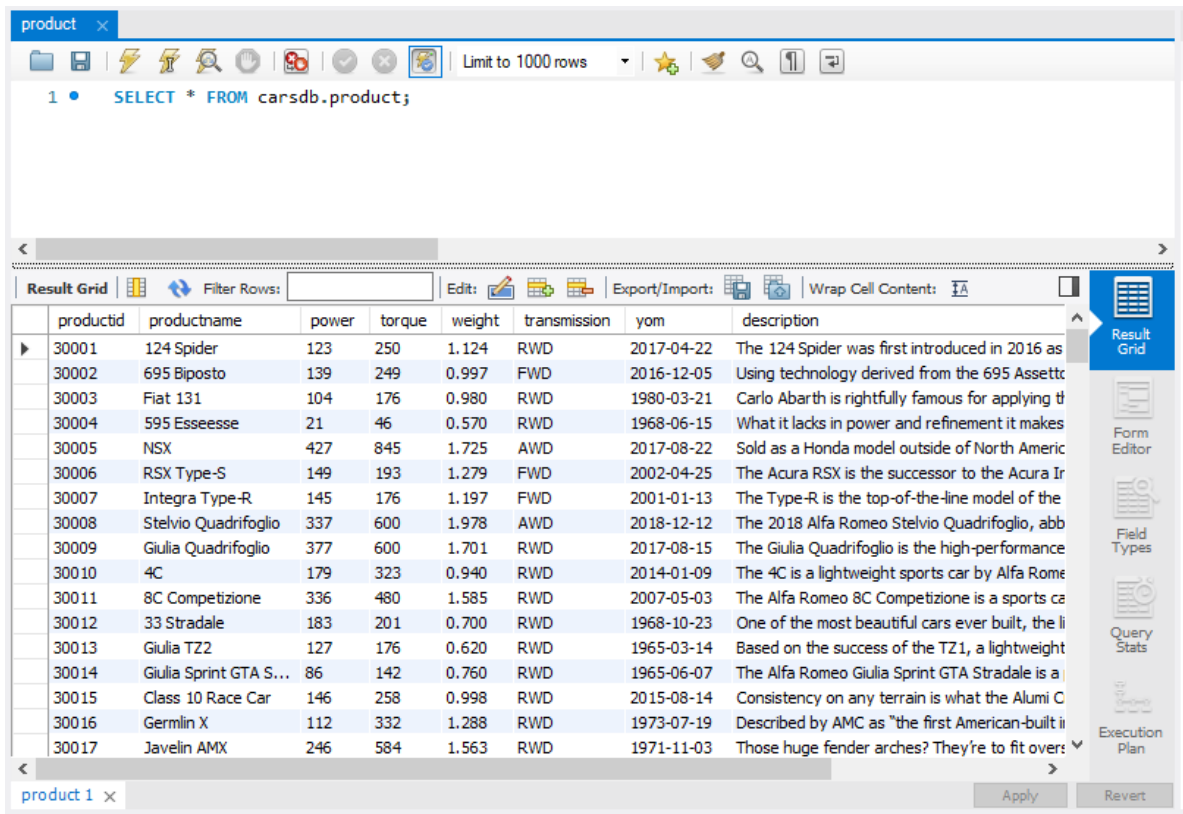
1.3. หน้าจอสถานะของ Container ของ MySQLServer

```
d35d0379ba9c    database    "docker-entrypoint.s…"    41 hours ago    Up 41 hours    0.0.0.0:3306->3306/tcp, :::3306->3306/
tcp, 33060/tcp    database
```

1.4. หน้าจอการเชื่อมต่อกับ MySQLServer แสดงชื่อฐานข้อมูลทั้งหมด

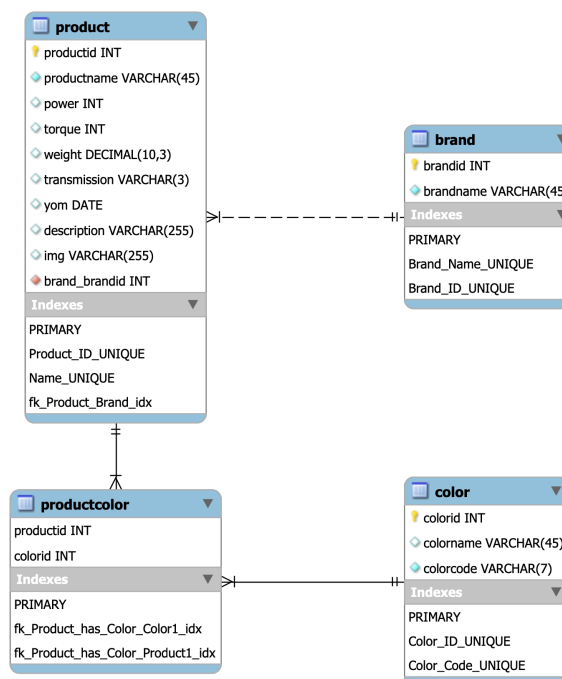1.5. หน้าจอการใช้คำสั่ง SELECT เพื่อดูข้อมูลในตารางหลักของระบบ เช่น ตาราง customer

2. การออกแบบและการใช้งานฐานข้อมูล (.pdf)

2.1. แผนภาพ Entity Relationship Diagram [ระบุ Data Type ของ MySQL]

2.2. Data Dictionary

Column	Data_type	Constaint	Description
brandid	INT	PK	รหัสแบรนด์
brandname	Varchar	Not Null	ชื่อแบรนด์

Column	Data_type	Constaint	Description
productid	INT	PK	รหัสรถ
productname	Varchar	Not Null	ชื่อรถ
power	INT		กำลัง(kW)
torque	INT		แรงบิด(Nm)
weight	Decimal		น้ำหนัก(t)
transmission	Varchar		ระบบช่วงล่าง
yom	Date		วัน-เดือน-ปีที่ผลิต
description	Varchar		คำอธิบาย
img	Varchar		รหัสรูปภาพ
brand_brandid	INT	FK	รหัสแบรนด์

Column	Data_type	Constaint	Description
productid	INT	PK,FK	รหัสรถ
colorid	INT	FK	รหัสสี

Column	Data_type	Constaint	Description
colorid	INT	PK	รหัสสี
colorname	Varchar	Not Null	ชื่อสี
colorcode	Varchar	Not Null	รหัสสี(#ffffff)

3. คำสั่งสร้างและนำเข้าข้อมูลและการกำหนดค่าผู้ใช้ฐานข้อมูล(.pdf)

    3.1. คำสั่งสร้างและการนำเข้าข้อมูล

คำสั่งสร้าง

```
  1   -- MySQL dump 10.13  Distrib 8.0.21, for Win64 (x86_64)
  2   --
  3   -- Host: localhost    Database: carsdb
  4   -- ------------------------------------------------------
  5   -- Server version       8.0.21
  6
  7   /*!40101 SET @OLD_CHARACTER_SET_CLIENT=@@CHARACTER_SET_CLIENT */;
  8   /*!40101 SET @OLD_CHARACTER_SET_RESULTS=@@CHARACTER_SET_RESULTS */;
  9   /*!40101 SET @OLD_COLLATION_CONNECTION=@@COLLATION_CONNECTION */;
 10   /*!50503 SET NAMES utf8 */;
 11   /*!40103 SET @OLD_TIME_ZONE=@@TIME_ZONE */;
 12   /*!40103 SET TIME_ZONE='+00:00' */;
 13   /*!40014 SET @OLD_UNIQUE_CHECKS=@@UNIQUE_CHECKS, UNIQUE_CHECKS=0 */;
 14   /*!40014 SET @OLD_FOREIGN_KEY_CHECKS=@@FOREIGN_KEY_CHECKS, FOREIGN_KEY_CHECKS=0 */;
 15   /*!40101 SET @OLD_SQL_MODE=@@SQL_MODE, SQL_MODE='NO_AUTO_VALUE_ON_ZERO' */;
 16   /*!40111 SET @OLD_SQL_NOTES=@@SQL_NOTES, SQL_NOTES=0 */;
 17
 18   --
 19   -- Table structure for table `brand`
 20   --
 21
 22   DROP TABLE IF EXISTS `brand`;
 23   /*!40101 SET @saved_cs_client     = @@character_set_client */;
 24   /*!50503 SET character_set_client = utf8mb4 */;
 25   CREATE TABLE `brand` (
 26     `brandid` int NOT NULL,
 27     `brandname` varchar(45) NOT NULL,
 28     PRIMARY KEY (`brandid`),
 29     UNIQUE KEY `Brand_Name_UNIQUE` (`brandname`),
 30     UNIQUE KEY `Brand_ID_UNIQUE` (`brandid`)
 31   ) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_0900_ai_ci;
 32   /*!40101 SET character_set_client = @saved_cs_client */;
 33
 34   --
 35   -- Dumping data for table `brand`
 36   --
```

```
 37
 38   LOCK TABLES `brand` WRITE;
 39   /*!40000 ALTER TABLE `brand` DISABLE KEYS */;
 40   INSERT INTO `brand` VALUES (10001,'ABARTH'),(10002,'ACURA'),(10003,'ALFA ROMEO'),(10004,'ALUMI CRAFT'),(10005,'AMC'),(10006,'AMG Transport Dynamics'),(10007,'AF
 41   /*!40000 ALTER TABLE `brand` ENABLE KEYS */;
 42   UNLOCK TABLES;
 43
 44   --
 45   -- Table structure for table `color`
 46   --
 47
 48   DROP TABLE IF EXISTS `color`;
 49   /*!40101 SET @saved_cs_client     = @@character_set_client */;
 50   /*!50503 SET character_set_client = utf8mb4 */;
 51   CREATE TABLE `color` (
 52     `colorid` int NOT NULL,
 53     `colorname` varchar(45) DEFAULT NULL,
 54     `colorcode` varchar(7) NOT NULL,
 55     PRIMARY KEY (`colorid`),
 56     UNIQUE KEY `Color_ID_UNIQUE` (`colorid`),
 57     UNIQUE KEY `Color_Code_UNIQUE` (`colorcode`)
 58   ) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_0900_ai_ci;
 59   /*!40101 SET character_set_client = @saved_cs_client */;
 60
 61   --
 62   -- Dumping data for table `color`
 63   --
 64
 65   LOCK TABLES `color` WRITE;
 66   /*!40000 ALTER TABLE `color` DISABLE KEYS */;
 67   INSERT INTO `color` VALUES (20001,'IndianRed','#CD5C5C'),(20002,'LightCoral','#F08080'),(20003,'Salmon','#FA8072'),(20004,'DarkSalmon','#E9967A'),(20005,'LightS
 68   /*!40000 ALTER TABLE `color` ENABLE KEYS */;
 69   UNLOCK TABLES;
 70
 71   --
 72   -- Table structure for table `product`
 73   --
```

```sql
DROP TABLE IF EXISTS `product`;
/*!40101 SET @saved_cs_client     = @@character_set_client */;
/*!50503 SET character_set_client = utf8mb4 */;
CREATE TABLE `product` (
  `productid` int NOT NULL,
  `productname` varchar(45) NOT NULL,
  `power` int DEFAULT NULL,
  `torque` int DEFAULT NULL,
  `weight` decimal(10,3) DEFAULT NULL,
  `transmission` varchar(3) DEFAULT NULL,
  `yom` date DEFAULT NULL,
  `description` varchar(255) DEFAULT NULL,
  `img` varchar(255) DEFAULT NULL,
  `brand_brandid` int NOT NULL,
  PRIMARY KEY (`productid`),
  UNIQUE KEY `Product_ID_UNIQUE` (`productid`),
  UNIQUE KEY `Name_UNIQUE` (`productname`),
  KEY `fk_Product_Brand_idx` (`brand_brandid`),
  CONSTRAINT `fk_Product_Brand` FOREIGN KEY (`brand_brandid`) REFERENCES `brand` (`brandid`)
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_0900_ai_ci;
/*!40101 SET character_set_client = @saved_cs_client */;

--
-- Dumping data for table `product`
--

LOCK TABLES `product` WRITE;
/*!40000 ALTER TABLE `product` DISABLE KEYS */;
INSERT INTO `product` VALUES (30001,'124 Spider',123,250,1.124,'RWD','2017-04-22','The 124 Spider was first introduced in 2016 as a homage to the 50th annivers
/*!40000 ALTER TABLE `product` ENABLE KEYS */;
UNLOCK TABLES;

--
-- Table structure for table `productcolor`
--

DROP TABLE IF EXISTS `productcolor`;
/*!40101 SET @saved_cs_client     = @@character_set_client */;
/*!50503 SET character_set_client = utf8mb4 */;
CREATE TABLE `productcolor` (
  `productid` int NOT NULL,
  `colorid` int NOT NULL,
  PRIMARY KEY (`productid`,`colorid`),
  KEY `fk_Product_has_Color_Color1_idx` (`colorid`),
  KEY `fk_Product_has_Color_Product1_idx` (`productid`),
  CONSTRAINT `fk_Product_has_Color_Color1` FOREIGN KEY (`colorid`) REFERENCES `color` (`colorid`),
  CONSTRAINT `fk_Product_has_Color_Product1` FOREIGN KEY (`productid`) REFERENCES `product` (`productid`)
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_0900_ai_ci;
/*!40101 SET character_set_client = @saved_cs_client */;

--
-- Dumping data for table `productcolor`
--

LOCK TABLES `productcolor` WRITE;
/*!40000 ALTER TABLE `productcolor` DISABLE KEYS */;
INSERT INTO `productcolor` VALUES (30001,20007),(30003,20007),(30005,20007),(30006,20007),(30008,20007),(30009,20007),(30010,20007),(30011,20007),(30012,20007),
/*!40000 ALTER TABLE `productcolor` ENABLE KEYS */;
UNLOCK TABLES;
/*!40103 SET TIME_ZONE=@OLD_TIME_ZONE */;

/*!40101 SET SQL_MODE=@OLD_SQL_MODE */;
/*!40014 SET FOREIGN_KEY_CHECKS=@OLD_FOREIGN_KEY_CHECKS */;
/*!40014 SET UNIQUE_CHECKS=@OLD_UNIQUE_CHECKS */;
/*!40101 SET CHARACTER_SET_CLIENT=@OLD_CHARACTER_SET_CLIENT */;
/*!40101 SET CHARACTER_SET_RESULTS=@OLD_CHARACTER_SET_RESULTS */;
/*!40101 SET COLLATION_CONNECTION=@OLD_COLLATION_CONNECTION */;
/*!40111 SET SQL_NOTES=@OLD_SQL_NOTES */;

-- Dump completed on 2021-05-03 16:45:07
```

การนำเข้าข้อมูล

brand.sql : ex.

```sql
1   INSERT INTO `carsdb`.`brand` (`brandid`, `brandname`) VALUES ('10001', 'ABARTH');
2   INSERT INTO `carsdb`.`brand` (`brandid`, `brandname`) VALUES ('10002', 'ACURA');
3   INSERT INTO `carsdb`.`brand` (`brandid`, `brandname`) VALUES ('10003', 'ALFA ROMEO');
4   INSERT INTO `carsdb`.`brand` (`brandid`, `brandname`) VALUES ('10004', 'ALUMI CRAFT');
5   INSERT INTO `carsdb`.`brand` (`brandid`, `brandname`) VALUES ('10005', 'AMC');
6   INSERT INTO `carsdb`.`brand` (`brandid`, `brandname`) VALUES ('10006', 'AMG Transport Dynamics');
7   INSERT INTO `carsdb`.`brand` (`brandid`, `brandname`) VALUES ('10007', 'ARIEL');
8   INSERT INTO `carsdb`.`brand` (`brandid`, `brandname`) VALUES ('10008', 'ASCARI');
9   INSERT INTO `carsdb`.`brand` (`brandid`, `brandname`) VALUES ('10009', 'ASTON MARTIN');
10  INSERT INTO `carsdb`.`brand` (`brandid`, `brandname`) VALUES ('10010', 'AUDI');
```

color.sql : ex.

```sql
1   INSERT INTO `carsdb`.`color` (`colorid`, `colorname`, `colorcode`) VALUES ('20001', 'IndianRed', '#CD5C5C');
2   INSERT INTO `carsdb`.`color` (`colorid`, `colorname`, `colorcode`) VALUES ('20002', 'LightCoral', '#F08080');
3   INSERT INTO `carsdb`.`color` (`colorid`, `colorname`, `colorcode`) VALUES ('20003', 'Salmon', '#FA8072');
4   INSERT INTO `carsdb`.`color` (`colorid`, `colorname`, `colorcode`) VALUES ('20004', 'DarkSalmon', '#E9967A');
5   INSERT INTO `carsdb`.`color` (`colorid`, `colorname`, `colorcode`) VALUES ('20005', 'LightSalmon', '#FFA07A');
6   INSERT INTO `carsdb`.`color` (`colorid`, `colorname`, `colorcode`) VALUES ('20006', 'Crimson', '#DC143C');
7   INSERT INTO `carsdb`.`color` (`colorid`, `colorname`, `colorcode`) VALUES ('20007', 'Red', '#FF0000');
8   INSERT INTO `carsdb`.`color` (`colorid`, `colorname`, `colorcode`) VALUES ('20008', 'FireBrick', '#B22222');
9   INSERT INTO `carsdb`.`color` (`colorid`, `colorname`, `colorcode`) VALUES ('20009', 'DarkRed', '#8B0000');
10  INSERT INTO `carsdb`.`color` (`colorid`, `colorname`, `colorcode`) VALUES ('20010', 'Pink', '#FFC0CB');
11  INSERT INTO `carsdb`.`color` (`colorid`, `colorname`, `colorcode`) VALUES ('20011', 'LightPink', '#FFB6C1');
12  INSERT INTO `carsdb`.`color` (`colorid`, `colorname`, `colorcode`) VALUES ('20012', 'HotPink', '#FF69B4');
13  INSERT INTO `carsdb`.`color` (`colorid`, `colorname`, `colorcode`) VALUES ('20013', 'DeepPink', '#FF1493');
14  INSERT INTO `carsdb`.`color` (`colorid`, `colorname`, `colorcode`) VALUES ('20014', 'MediumVioletRed', '#C71585');
15  INSERT INTO `carsdb`.`color` (`colorid`, `colorname`, `colorcode`) VALUES ('20015', 'PaleVioletRed', '#DB7093');
```

productcolor.sql : ex

```sql
1   INSERT INTO `carsdb`.`productcolor` (`productid`, `colorid`) VALUES ('30001', '20139');
2   INSERT INTO `carsdb`.`productcolor` (`productid`, `colorid`) VALUES ('30001', '20117');
3   INSERT INTO `carsdb`.`productcolor` (`productid`, `colorid`) VALUES ('30001', '20007');
4   INSERT INTO `carsdb`.`productcolor` (`productid`, `colorid`) VALUES ('30001', '20076');
5   INSERT INTO `carsdb`.`productcolor` (`productid`, `colorid`) VALUES ('30002', '20138');
6   INSERT INTO `carsdb`.`productcolor` (`productid`, `colorid`) VALUES ('30003', '20007');
7   INSERT INTO `carsdb`.`productcolor` (`productid`, `colorid`) VALUES ('30003', '20023');
8   INSERT INTO `carsdb`.`productcolor` (`productid`, `colorid`) VALUES ('30003', '20095');
9   INSERT INTO `carsdb`.`productcolor` (`productid`, `colorid`) VALUES ('30003', '20117');
10  INSERT INTO `carsdb`.`productcolor` (`productid`, `colorid`) VALUES ('30004', '20117');
11  INSERT INTO `carsdb`.`productcolor` (`productid`, `colorid`) VALUES ('30005', '20139');
12  INSERT INTO `carsdb`.`productcolor` (`productid`, `colorid`) VALUES ('30005', '20117');
13  INSERT INTO `carsdb`.`productcolor` (`productid`, `colorid`) VALUES ('30005', '20007');
14  INSERT INTO `carsdb`.`productcolor` (`productid`, `colorid`) VALUES ('30005', '20095');
15  INSERT INTO `carsdb`.`productcolor` (`productid`, `colorid`) VALUES ('30006', '20139');
```

product.sql : ex

```sql
1   INSERT INTO `carsdb`.`product` (`productid`, `productname`, `power`, `torque`, `weight`, `transmission`, `yom`, `description`, `img`, `brand_brandid`)
2       VALUES ('30001', '124 Spider', '123', '250', '1.124', 'RWD', '2017-04-22', 'The 124 Spider was first introduced in 2016 as a homage to the 50th anniversary of t
3   INSERT INTO `carsdb`.`product` (`productid`, `productname`, `power`, `torque`, `weight`, `transmission`, `yom`, `description`, `img`, `brand_brandid`)
4       VALUES ('30002', '695 Biposto', '139', '249', '0.997', 'FWD', '2016-12-05', 'Using technology derived from the 695 Assetto Corse racing car series, it is curren
5   INSERT INTO `carsdb`.`product` (`productid`, `productname`, `power`, `torque`, `weight`, `transmission`, `yom`, `description`, `img`, `brand_brandid`)
6       VALUES ('30003', 'Fiat 131', '104', '176', '0.98', 'RWD', '1980-03-21', 'Carlo Abarth is rightfully famous for applying the dark art of tuning to some of the mo
7   INSERT INTO `carsdb`.`product` (`productid`, `productname`, `power`, `torque`, `weight`, `transmission`, `yom`, `description`, `img`, `brand_brandid`)
8       VALUES ('30004', '595 Esseesse', '21', '46', '0.57', 'RWD', '1968-06-15', 'What it lacks in power and refinement it makes up for in character and likability. Th
9   INSERT INTO `carsdb`.`product` (`productid`, `productname`, `power`, `torque`, `weight`, `transmission`, `yom`, `description`, `img`, `brand_brandid`)
10      VALUES ('30005', 'NSX', '427', '845', '1.725', 'AWD', '2017-08-22', 'Sold as a Honda model outside of North America, the 2017 NSX is an AWD hybrid supercar that
11  INSERT INTO `carsdb`.`product` (`productid`, `productname`, `power`, `torque`, `weight`, `transmission`, `yom`, `description`, `img`, `brand_brandid`)
12      VALUES ('30006', 'RSX Type-S', '149', '193', '1.279', 'FWD', '2002-04-25', 'The Acura RSX is the successor to the Acura Integra that was sold in North America a
13  INSERT INTO `carsdb`.`product` (`productid`, `productname`, `power`, `torque`, `weight`, `transmission`, `yom`, `description`, `img`, `brand_brandid`)
14      VALUES ('30007', 'Integra Type-R', '145', '176', '1.197', 'FWD', '2001-01-13', 'The Type-R is the top-of-the-line model of the last generation Acura Integra, th
15  INSERT INTO `carsdb`.`product` (`productid`, `productname`, `power`, `torque`, `weight`, `transmission`, `yom`, `description`, `img`, `brand_brandid`)
16      VALUES ('30008', 'Stelvio Quadrifoglio', '337', '600', '1.978', 'AWD', '2018-12-12', 'The 2018 Alfa Romeo Stelvio Quadrifoglio, abbreviated as Alfa Stelvio, is
17  INSERT INTO `carsdb`.`product` (`productid`, `productname`, `power`, `torque`, `weight`, `transmission`, `yom`, `description`, `img`, `brand_brandid`)
18      VALUES ('30009', 'Giulia Quadrifoglio', '377', '600', '1.701', 'RWD', '2017-08-15', 'The Giulia Quadrifoglio is the high-performance model of the new Giulia lin
```

3.2. การกำหนดค่าผู้ใช้ฐานข้อมูล

CREATE USER 'chom'@'%' IDENTIFIED BY 'mysql';

CREATE USER 'kamin'@'%' IDENTIFIED BY 'mysql';

GRANT SELECT, INSERT, UPDATE, DELETE, CREATE, DROP, RELOAD, EXECUTE, CREATE VIEW, SHOW VIEW,
CREATE ROLE, DROP ROLE ON *.* TO `chom`@`%` WITH GRANT OPTION;

GRANT SELECT, INSERT, UPDATE, DELETE, CREATE, DROP, RELOAD, EXECUTE, CREATE VIEW, SHOW VIEW,
CREATE ROLE, DROP ROLE ON *.* TO `kamin`@`%` WITH GRANT OPTION;

commit;

```
1   CREATE USER 'chom'@'%' IDENTIFIED BY 'mysql';
2   CREATE USER 'kamin'@'%' IDENTIFIED BY 'mysql';
3
4   GRANT SELECT, INSERT, UPDATE, DELETE, CREATE, DROP, RELOAD, EXECUTE, CREATE VIEW, SHOW VIEW, CREATE ROLE, DROP ROLE ON *.* TO `chom`@`%` WITH GRANT OPTION;
5   GRANT SELECT, INSERT, UPDATE, DELETE, CREATE, DROP, RELOAD, EXECUTE, CREATE VIEW, SHOW VIEW, CREATE ROLE, DROP ROLE ON *.* TO `kamin`@`%` WITH GRANT OPTION;
6
7   commit;
```