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INTRODUCTION

Renting a property can be a very good option for people but only if they get a good landlord. According to a national survey of housing tenants, renters in Australia feel that they lack the power to demand standard property maintenance.[1] Tenants feel that even for basic property management or damage they have to make multiple calls to tenants. Landlords act as middlemen between renters and tradesman, they manage when the renters would be home so that the traders can come and complete their repair jobs. This system makes the entire process full for hassle which results in delays, improper maintenance, and bad repair jobs. Looking at this from a landlord's point of view, one person can have multiple properties to look after, and it can get difficult to manage all property problems together.

To make this process easier for everyone we need a system where renters can register a complains about their property, tenants can see all their properties and their complains (if any). The system will allow renters to see the progress of their complain and allow them to write reviews about the job. Landlords will be able to manage all their property complains better as they can see everything through a single portal.

Requirements:
Programming language: HTML, CSS, Flask, Python, MySQL
Software: VS Code, XAMPP (For localhost and SQL database)

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[1] https://www.abc.net.au/news/2017-02-21/australians-share-their-rental-horror-stories/8277394

FUNCTIONALITIES

There will be options for all three to login using their respective IDs and password. All three will have different homepage and with different functionalities.

Tenants:
1. They will have the functionality to register a maintenance request.
2. They can also see the status of their request.

Landlords:
1. They can see a list of all their properties.
2. They will have the ability to see all the requests for their property and sort the list according to set filters.
3. They can assign maintenance tasks to tradesmen of their choice.

Trades:
1. They will have the ability to see all the tasks assigned to them with property address.
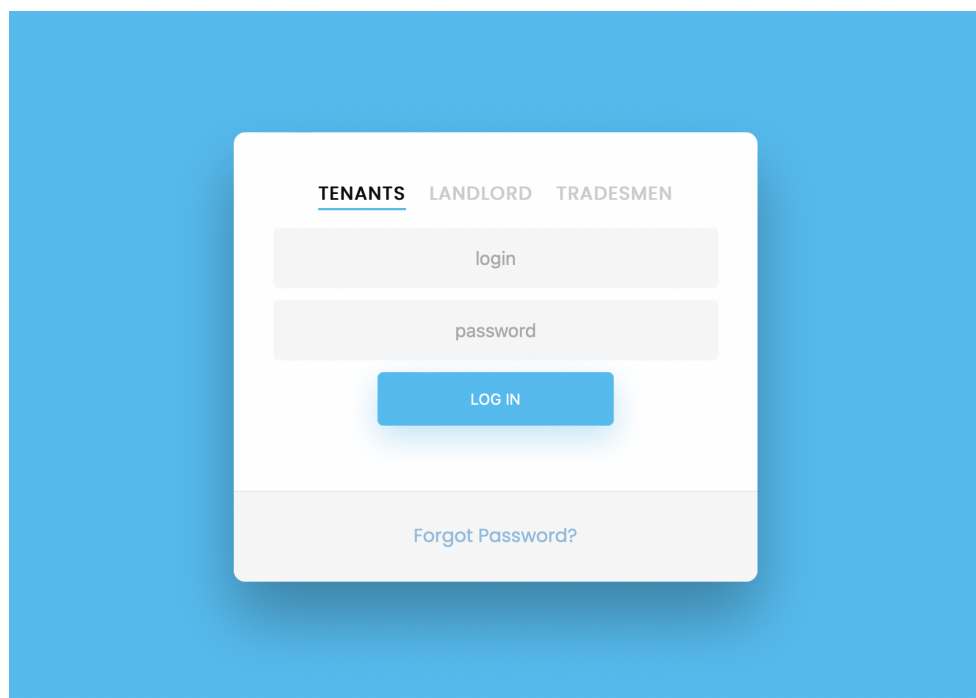2. They can update the request status.
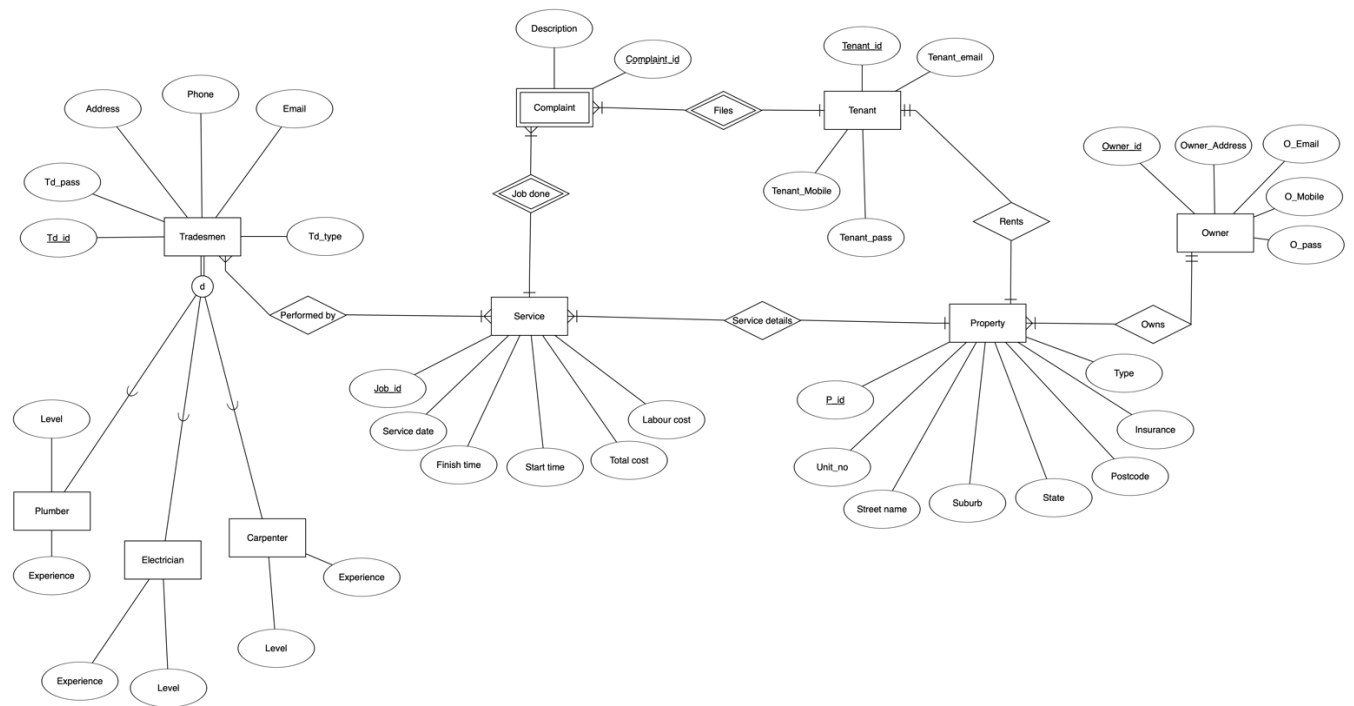
Fig 1: Home page with all three logins

ER DIAGRAM

Fig 2: ER Diagram – PropertyManager
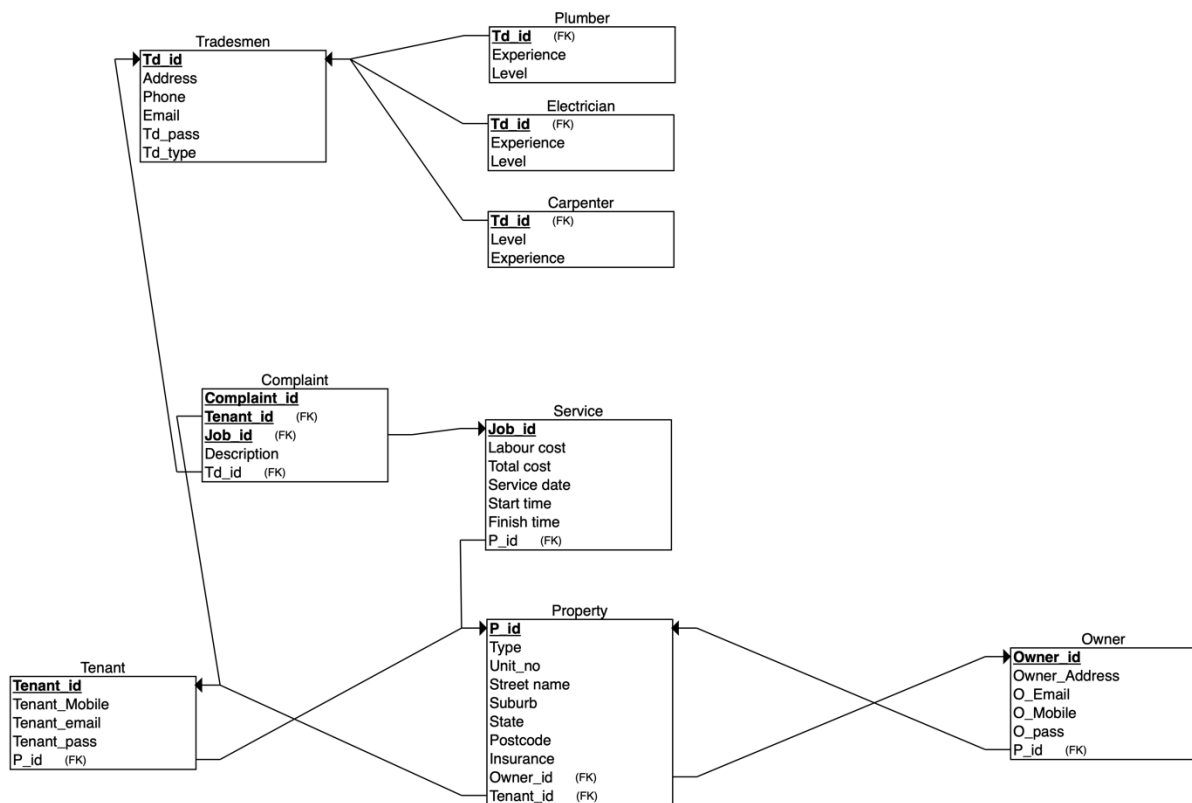
RELATIONAL SCHEMA

Fig 3: Schema – PropertyManager

Key:

    Attributes in bold are primary key

    FK -> Foreign key

Strong entity:

1. Tenant[<u>Tenant_id: Integer</u>, Tenant_email: Varchar, Tenant_pass: Varchar, P_id: Integer]
2. Property[<u>P_id: Integer</u>, Type: Varchar, Unit_no: Integer, Street_name: Varchar, Suburb: Varchar, State: Varchar, Postcode: Integer, Insurance: Integer, Owner_id: Integer, Tenant_id: Integer]
3. Owner[<u>Owner_id: Integer</u>, Owner_Address: Varchar, O_Email: Varchar, O_Mobile: Integer, O_pass: Varchar]
4. Service[<u>Job_id: Integer</u>, Labour_cost: Integer, Total_cost: Integer, Service_date: Date, Start_time: Time, Finish_time: Time, P_id: Integer]
5. Tradesmen[<u>Td_id: Integer</u>, Address: Varchar, Phone: Integer, Email: Varchar, Td_pass: Varchar, Td_type: Varchar]
6. Plumber[<u>Td_id: Integer</u>, Experience: Integer, Level: Integer]

7. Carpenter[Td_id: Integer, Experience: Integer, Level: Integer]
8. Electrician[Td_id: Integer, Experience: Integer, Level: Integer]

Weak entity:
1. Complaint[Complaint_id: Integer, Tenant_id: Integer, Job_id: Integer, Description:Varchar, Td_id:Integer]

Relational cardinality:
- All my relations are one to many (1 -> M).

Participation cardinality:

Relationship	Relation Between entities	Participation Cardinality
Rents	Tenant - Property	Tenant(T) – Property(P)
Owns	Property - Owner	Property(T) – Owner(T)
Performed by	Tradesmen – Service	Tradesmen(P) – Service(T)
Service Details	Service - Property	Service(T) – Property(P)
Files (weak)	Tenant - Complaint	Tenant(P) – Complaint(T)
Job done (weak)	Service - Complaint	Service(T) - Complaint(T)

Key:
    Total participation (T)
    Partial Participation (P)

FUNCTIONAL DEPENDENCIES

- Service
  - **Job_id ->** Service_date, Finish_time, Start_time, Total_cost, Labour_cost

- Property
  - **P_id ->** unit_no, street_name, suburb, state, postcode, insurance, type

- Owner
  - **Owner_id ->** owner_address, O_Email, O_mobile, O_pass

- Complaint
  - **Complaint_id, Tenant_id, Job_id ->** Description, Td_id

- Tenant
  - **Tenant_id ->** Tenant_Mobile, Tenant_email, Tenant_pass, P_id

- Tradesmen
  - **Td_id ->** Td_pass, Address, Phone, Email, Td_type
  - Plumber:
    - **Td_id ->** Level, Experience
  - Electrician:
    - **Td_id ->** Level, Experience
  - Carpenter:
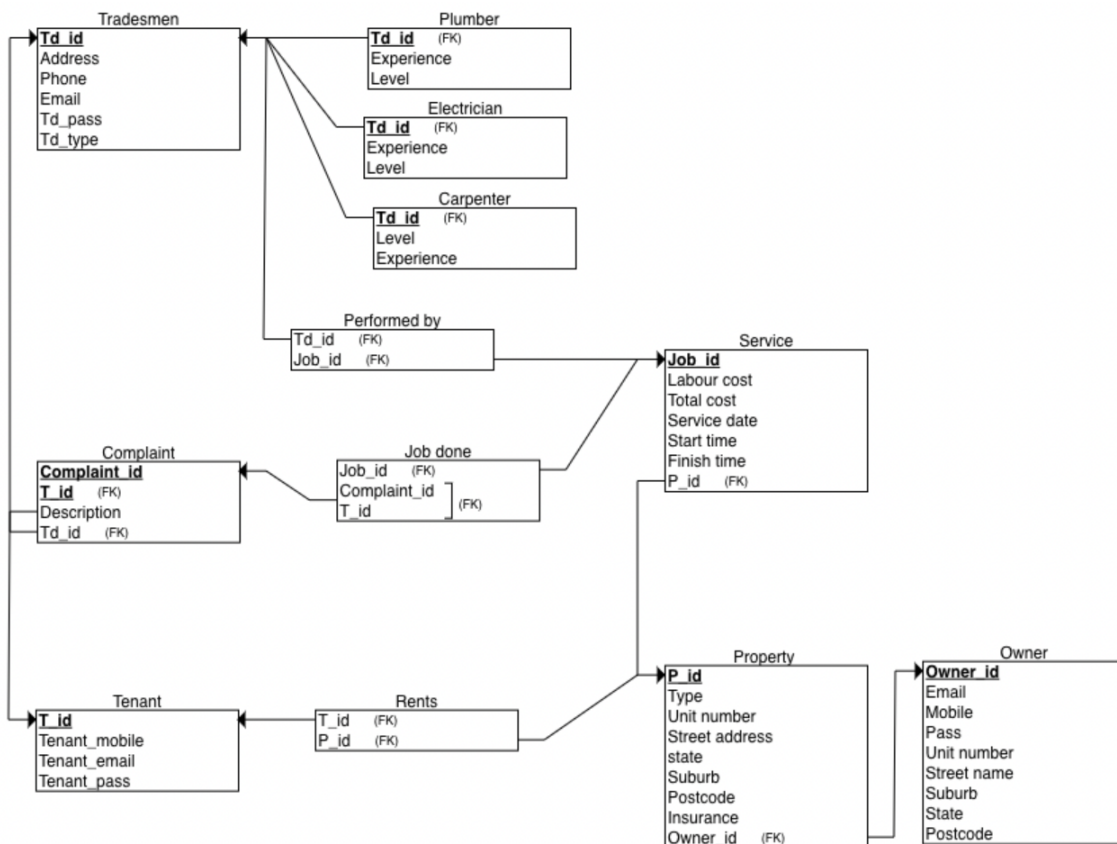   - **Td_id ->** Level, Experience

NORMALIZATION

Fig 4: Normalized schema

Key:

    Attributes in bold are primary key
    FK -> Foreign key

SCRENSHOTS

```
SELECT * FROM `Tradesmen`
```

Show all | Number of rows: 25 | Filter rows: Search this table | Sort by key: None

+ Options

		Td_id	Address	Email	Phone	Td_pass	Td_type
☐	Edit Copy Delete	1	15 Stillwater Avenue	staffelb@verizon.net	514361549	1234	Plumber
☐	Edit Copy Delete	2	1 Buoro Street	hedwig@outlook.com	558549604	1234	Plumber
☐	Edit Copy Delete	3	45 Todd Street	rddesign@msn.com	975496879	1234	Electrician
☐	Edit Copy Delete	4	62 Gloucester Avenue	punkis@aol.com	873749104	1234	Carpenter
☐	Edit Copy Delete	5	72 Cedar Street	world@hotmail.com	418945994	1234	Electrician

Check all   With selected: Edit   Copy   Delete   Export

Fig 5: Tradesmen table populated with 5 entries

```
SELECT * FROM `Complaint`
```

Show all | Number of rows: 25 | Filter rows: Search this table | Sort by key: None

+ Options

		Complaint_id	Tenant_id	Job_id	Description	Td_id
☐	Edit Copy Delete	1	4	1	Power points in living room stopped working	3
☐	Edit Copy Delete	2	5	2	The oven is not working properly. Needs to be chan...	5
☐	Edit Copy Delete	3	3	kkkk@gmail.com door garage door is not opening	4
☐	Edit Copy Delete	4	1	4	The dishwasher water is leaking	1
☐	Edit Copy Delete	5	2	5	There is problem with the geyser, I don't have hot...	1

Check all   With selected: Edit   Copy   Delete   Export

Fig 6: Populated complain table with 5 entries

✔ Showing rows 0 - 1 (2 total, Query took 0.0013 seconds.)

```
SELECT * FROM `Complaint` WHERE TD_id = 1
```

Show all | Number of rows: 25 | Filter rows: Search this table | Sort by key: None

+ Options

		Complaint_id	Tenant_id	Job_id	Description	Td_id
☐	Edit Copy Delete	4	1	4	The dishwasher water is leaking	1
☐	Edit Copy Delete	5	2	5	There is problem with the geyser, I don't have hot...	1

Check all   With selected: Edit   Copy   Delete   Export

Fig 7: Finding the complaint with TD_id = 1 (Electrician)

SQL DUMP

```sql
-- phpMyAdmin SQL Dump
-- version 5.0.4
-- https://www.phpmyadmin.net/
--
-- Host: localhost
-- Generation Time: Apr 17, 2022 at 11:20 AM
-- Server version: 10.4.17-MariaDB
-- PHP Version: 8.0.2

SET SQL_MODE = "NO_AUTO_VALUE_ON_ZERO";
START TRANSACTION;
SET time_zone = "+00:00";


/*!40101 SET @OLD_CHARACTER_SET_CLIENT=@@CHARACTER_SET_CLIENT */;
/*!40101 SET @OLD_CHARACTER_SET_RESULTS=@@CHARACTER_SET_RESULTS */;
/*!40101 SET @OLD_COLLATION_CONNECTION=@@COLLATION_CONNECTION */;
/*!40101 SET NAMES utf8mb4 */;


--
-- Database: `PropertyManager`
--



-- --------------------------------------------------------


--
-- Table structure for table `Carpenter`
--


CREATE TABLE `Carpenter` (
  `Td_id`  int(11) NOT NULL,
  `Level`  int(11) NOT NULL,
  `Experience`  int(11) NOT NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4;


--
-- Dumping data for table `Carpenter`
--


INSERT INTO `Carpenter` (`Td_id`, `Level`, `Experience`) VALUES
(2, 3, 7),
(1, 4, 10);


-- --------------------------------------------------------


--
-- Table structure for table `Complaint`
--
```

```sql
CREATE TABLE `Complaint` (
  `Complaint_id` int(11) NOT NULL,
  `Tenant_id` int(11) NOT NULL,
  `Job_id` int(11) NOT NULL,
  `Description` varchar(100) NOT NULL,
  `Td_id` int(11) NOT NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4;

--
-- Dumping data for table `Complaint`
--

INSERT INTO `Complaint` (`Complaint_id`, `Tenant_id`, `Job_id`, `Description`,
`Td_id`) VALUES
(1, 4, 1, 'Power points in living room stopped working ', 3),
(2, 5, 2, 'The oven is not working properly. Needs to be changed ', 5),
(3, 3, 3, 'The door garage door is not opening ', 4),
(4, 1, 4, 'The dishwasher water is leaking ', 1),
(5, 2, 5, 'There is problem with the geyser, I don\'t have hot water anymore ', 2);

-- --------------------------------------------------------

--
-- Table structure for table `Electrician`
--

CREATE TABLE `Electrician` (
  `Td_id` int(11) NOT NULL,
  `Experience` int(11) NOT NULL,
  `Level` int(11) NOT NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4;

--
-- Dumping data for table `Electrician`
--

INSERT INTO `Electrician` (`Td_id`, `Experience`, `Level`) VALUES
(3, 2, 1),
(5, 5, 2);

-- --------------------------------------------------------

--
-- Table structure for table `Owner`
--

CREATE TABLE `Owner` (
  `Owner_id` int(11) NOT NULL,
  `Owner_address` varchar(100) NOT NULL,
  `O_email` varchar(100) NOT NULL,
  `O_mobile` int(11) NOT NULL,
```

```
  `O_pass` varchar(10) NOT NULL,
  `P_id` int(11) NOT NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4;


--
-- Dumping data for table `Owner`
--

INSERT INTO `Owner` (`Owner_id`, `Owner_address`, `O_email`, `O_mobile`, `O_pass`,
`P_id`) VALUES
(1, '2660 Cotton Sky Range', 'blabla@gmail.com', 947638251, '1234', 3),
(2, '8542 Heather Robin Bay', 'whitep12@gmail.com', 673827267, '1234', 1),
(3, '7535 Umber Brook Village', 'abcd@gmail.com', 981427267, '1234', 5),
(4, '7215 Burning Maze', 'hgdi@gmail.com', 941408967, '1234', 2),
(5, '5529 Hidden Wharf', 'hotdog@gmail.com', 941404797, '1234', 4);

-- --------------------------------------------------------


--
-- Table structure for table `Plumber`
--

CREATE TABLE `Plumber` (
  `Td_id` int(11) NOT NULL,
  `Experience` int(11) NOT NULL,
  `Level` int(11) NOT NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4;

--
-- Dumping data for table `Plumber`
--

INSERT INTO `Plumber` (`Td_id`, `Experience`, `Level`) VALUES
(4, 8, 3);

-- --------------------------------------------------------


--
-- Table structure for table `Property`
--

CREATE TABLE `Property` (
  `P_id` int(11) NOT NULL,
  `Type` varchar(100) NOT NULL,
  `Unit_no` int(11) NOT NULL,
  `Street_Name` varchar(100) NOT NULL,
  `Suburb` varchar(100) NOT NULL,
  `State` varchar(100) NOT NULL,
  `Postcode` int(11) NOT NULL,
  `Insurance` int(11) NOT NULL,
  `Owner_id` int(11) NOT NULL,
```

```sql
  `Tenant_id` int(11) NOT NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4;

--
-- Dumping data for table `Property`
--

INSERT INTO `Property` (`P_id`, `Type`, `Unit_no`, `Street_Name`, `Suburb`,
`State`, `Postcode`, `Insurance`, `Owner_id`, `Tenant_id`) VALUES
(1, 'House', 28, 'Bathurst Road', 'Perthville', 'New South Wales', 2764, 1, 1, 3),
(2, 'Flat', 13, 'Marley Point Road', 'Suggan Buggan', 'Victoria', 3885, 1, 3, 2),
(3, 'House ', 20, 'Saggers Road', 'Jerdacuttup', 'Western Australia', 6346, 1, 5,
1),
(4, 'House', 44, 'Kogil Street', 'Gravesend', 'New South Wales', 2401, 1, 4, 5),
(5, 'House', 62, 'Edgewater Close', 'Sussex Inlet', 'Queensland', 4001, 1, 2, 4);

-- --------------------------------------------------------


--
-- Table structure for table `Service`
--

CREATE TABLE `Service` (
  `Job_id` int(11) NOT NULL,
  `Labour_cost` int(11) NOT NULL,
  `Total_cost` int(11) NOT NULL,
  `Start_time` time NOT NULL,
  `Finish_time` time NOT NULL,
  `Service_date` date NOT NULL,
  `P_id` int(11) NOT NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4;

--
-- Dumping data for table `Service`
--

INSERT INTO `Service` (`Job_id`, `Labour_cost`, `Total_cost`, `Start_time`,
`Finish_time`, `Service_date`, `P_id`) VALUES
(1, 183, 200, '18:30:30', '19:45:30', '2022-04-08', 4),
(2, 200, 200, '10:40:29', '10:54:33', '2022-03-17', 1),
(3, 1000, 1300, '09:10:00', '09:50:00', '2022-05-18', 2),
(4, 100, 126, '12:20:00', '14:50:00', '2022-03-14', 5),
(5, 150, 160, '15:30:03', '18:40:03', '2022-04-02', 3);

-- --------------------------------------------------------


--
-- Table structure for table `Tenant`
--

CREATE TABLE `Tenant` (
```

```sql
  `Tenant_id` int(11) NOT NULL,
  `Tenant_mobile` int(11) NOT NULL,
  `Tenant_email` varchar(100) NOT NULL,
  `Tenant_pass` varchar(10) NOT NULL,
  `P_id` int(11) NOT NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4;

--
-- Dumping data for table `Tenant`
--

INSERT INTO `Tenant` (`Tenant_id`, `Tenant_mobile`, `Tenant_email`, `Tenant_pass`,
`P_id`) VALUES
(1, 967531705, 'sheldon@gmail.com', '1234', 1),
(2, 725776924, 'sheldon@gmail.com', '1234', 3),
(3, 968686257, 'lubz@gmail.com', '1234', 4),
(4, 366035857, 'abhi@gmail.com', '1234', 2),
(5, 200193995, 'kkkk@gmail.com', '1234', 5);


-- --------------------------------------------------------


--
-- Table structure for table `Tradesmen`
--

CREATE TABLE `Tradesmen` (
  `Td_id` int(11) NOT NULL,
  `Address` varchar(100) NOT NULL,
  `Email` varchar(100) NOT NULL,
  `Phone` int(11) NOT NULL,
  `Td_pass` varchar(10) NOT NULL,
  `Td_type` varchar(100) NOT NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4;

--
-- Dumping data for table `Tradesmen`
--

INSERT INTO `Tradesmen` (`Td_id`, `Address`, `Email`, `Phone`, `Td_pass`,
`Td_type`) VALUES
(1, '15 Stillwater Avenue', 'staffelb@verizon.net', 514361549, '1234', 'Plumber'),
(2, '1 Buoro Street', 'hedwig@outlook.com', 558549604, '1234', 'Plumber'),
(3, '45 Todd Street', 'rddesign@msn.com', 975496879, '1234', 'Electrician'),
(4, '62 Gloucester Avenue', 'punkis@aol.com', 873749104, '1234', 'Carpenter'),
(5, '72 Cedar Street', 'world@hotmail.com', 418945994, '1234', 'Electrician');


--
-- Indexes for dumped tables
--

--
```

```sql
-- Indexes for table `Carpenter`
--
ALTER TABLE `Carpenter`
  ADD KEY `carpenter_ibfk_1` (`Td_id`);


--
-- Indexes for table `Complaint`
--
ALTER TABLE `Complaint`
  ADD PRIMARY KEY (`Complaint_id`),
  ADD KEY `complaint_ibfk_1` (`Tenant_id`),
  ADD KEY `complaint_ibfk_2` (`Job_id`),
  ADD KEY `complaint_ibfk_3` (`Td_id`);


--
-- Indexes for table `Electrician`
--
ALTER TABLE `Electrician`
  ADD KEY `electrician_ibfk_1` (`Td_id`);


--
-- Indexes for table `Owner`
--
ALTER TABLE `Owner`
  ADD PRIMARY KEY (`Owner_id`),
  ADD KEY `P_id` (`P_id`);


--
-- Indexes for table `Plumber`
--
ALTER TABLE `Plumber`
  ADD KEY `plumber_ibfk_1` (`Td_id`);


--
-- Indexes for table `Property`
--
ALTER TABLE `Property`
  ADD PRIMARY KEY (`P_id`),
  ADD KEY `property_ibfk_1` (`Tenant_id`),
  ADD KEY `property_ibfk_2` (`Owner_id`);


--
-- Indexes for table `Service`
--
ALTER TABLE `Service`
  ADD PRIMARY KEY (`Job_id`),
  ADD KEY `service_ibfk_1` (`P_id`);


--
-- Indexes for table `Tenant`
--
```

```sql
ALTER TABLE `Tenant`
  ADD PRIMARY KEY (`Tenant_id`),
  ADD KEY `tenant_ibfk_1` (`P_id`);

--
-- Indexes for table `Tradesmen`
--
ALTER TABLE `Tradesmen`
  ADD PRIMARY KEY (`Td_id`);

--
-- Constraints for dumped tables
--

--
-- Constraints for table `Carpenter`
--
ALTER TABLE `Carpenter`
  ADD CONSTRAINT `carpenter_ibfk_1` FOREIGN KEY (`Td_id`) REFERENCES `Tradesmen`
(`Td_id`) ON DELETE CASCADE ON UPDATE CASCADE;

--
-- Constraints for table `Complaint`
--
ALTER TABLE `Complaint`
  ADD CONSTRAINT `complaint_ibfk_1` FOREIGN KEY (`Tenant_id`) REFERENCES `Tenant`
(`Tenant_id`) ON DELETE CASCADE ON UPDATE CASCADE,
  ADD CONSTRAINT `complaint_ibfk_2` FOREIGN KEY (`Job_id`) REFERENCES `Service`
(`Job_id`) ON DELETE CASCADE ON UPDATE CASCADE,
  ADD CONSTRAINT `complaint_ibfk_3` FOREIGN KEY (`Td_id`) REFERENCES `Tradesmen`
(`Td_id`) ON DELETE CASCADE ON UPDATE CASCADE;

--
-- Constraints for table `Electrician`
--
ALTER TABLE `Electrician`
  ADD CONSTRAINT `electrician_ibfk_1` FOREIGN KEY (`Td_id`) REFERENCES `Tradesmen`
(`Td_id`) ON DELETE CASCADE ON UPDATE CASCADE;

--
-- Constraints for table `Owner`
--
ALTER TABLE `Owner`
  ADD CONSTRAINT `owner_ibfk_1` FOREIGN KEY (`P_id`) REFERENCES `Property`
(`P_id`);

--
-- Constraints for table `Plumber`
--
ALTER TABLE `Plumber`
```

```sql
  ADD CONSTRAINT `plumber_ibfk_1` FOREIGN KEY (`Td_id`) REFERENCES `Tradesmen`
(`Td_id`) ON DELETE CASCADE ON UPDATE CASCADE;


--
-- Constraints for table `Property`
--
ALTER TABLE `Property`
  ADD CONSTRAINT `property_ibfk_1` FOREIGN KEY (`Tenant_id`) REFERENCES `Tenant`
(`Tenant_id`) ON DELETE CASCADE ON UPDATE CASCADE,
  ADD CONSTRAINT `property_ibfk_2` FOREIGN KEY (`Owner_id`) REFERENCES `Owner`
(`Owner_id`) ON DELETE CASCADE ON UPDATE CASCADE;


--
-- Constraints for table `Service`
--
ALTER TABLE `Service`
  ADD CONSTRAINT `service_ibfk_1` FOREIGN KEY (`P_id`) REFERENCES `Property`
(`P_id`) ON DELETE CASCADE ON UPDATE CASCADE;


--
-- Constraints for table `Tenant`
--
ALTER TABLE `Tenant`
  ADD CONSTRAINT `tenant_ibfk_1` FOREIGN KEY (`P_id`) REFERENCES `Property`
(`P_id`) ON DELETE CASCADE ON UPDATE CASCADE;
COMMIT;

/*!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 */;
```