SPACE AGENCY DATABASE

A PROJECT REPORT

Submitted by

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Under the guidance of

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BONAFIDE CERTIFICATE

Certified that this project report "**SPACE AGENCY DATABASE"** is the bonafide work of **Jeel Patel (21BTAI26) , Maanan Jagani (21BTAI49)** who carried out the project work under my supervision as a part of Project Based Learning in Course-Database Management System Lab (21BTCS23C08).

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VIVA-VOCE EXAMINATION

The viva-voice examination of the project work titled "**SPACE AGENCY DATABASE"** submitted by **JEEL PATEL (21BTAI26) , MAANAN JAGANI (21BTAI49)** is

held on _____

INTERNAL EXAMINER **EXTERNAL EXAMINER**

ACKNOWLEDGEMENT

I thank the **Almighty** for showering his blessing upon me in completing the project. I submit this project with a deep sense of gratitude and reverence for my beloved parents for their moral support and encouragement.

I express my sincere gratitude to **Dr.RAJU SHANMUGAM**, Professor & Dean, Department Of Computer Engineering, Unitedworld School of Computational Intelligence for providing strong oversight of vision, strategic direction , encouragement and valuable suggestions.

I convey my earnest thanks to **Ms.DIVYA MOHAN**, Assistant Professor , Department Of Computer Applications, for her valuable guidance and support throughout the project.

I extend my sincere thanks to all my staff members for their valuable suggestions, timely advice and support throughout.

- Student team members name

Abstract

The main objective of this project is to Design a system that helps space agencies like ISRO, NASA to track their missions, findings, and space element movements. Keep track of satellite heath, positions and services. It should also keep track of stars, planets, blackholes, moving stars, big asteroids and notify the scientists when some event occurs, or alert about the future collisions with earth or other entities. This system should be able keep track of their experiment and outcomes.

Our mission will facilitate users to get information about any missions of ISRO. If a user wants any information about any mission he can get it by our product only by mission name. Our product will provide information about mission launching date, Orbit type, Application, mission was successful or not.

- Will let users add new missions, access current live mission data, experiments and outcomes.
- WIll let users access satellite data along with its health, position and services offered.
- Will have a dedicated login feature to access each tier of information in the database. Every extra information access will require a different username and password.
- Will alert the users with DBA class if there is some possibility of future collisions with earth.

This project uses MYSQL as back end.

TABLE OF CONTENTS

Chapter 1

INTRODUCTION

This chapter deals with the general introduction of the project, existing system and the proposed system of this project. General gives a broad introduction of the project and tools to implement it. Existing system explains the deals of the current system and its limitations and proposed system provides solution to overcome those limitations.

1.1 PURPOSE

Design a system that helps space agencies like ISRO, NASA to track their missions, findings, and space element movements. Keep track of satellite heath, positions and services.It should also keep track of stars, planets, blackholes, moving stars, big asteroids and notify the scientists when some event occurs,or alert about the future collisions with earth or other entities.This system should be able keep track of their experiment and outcomes.When need arises different agencies should be able to work-together to complete the mission.

1. Our System will keep track of all old missions,current missions and future missions launched by our space agency ISRO.
2. Our system will keep track of satellites, it’s objectives, overall functionality and it’s real time position.
3. Also, we will keep track of important exoplanets which have the potential of earth-like-characteristics and potential life; which will aid in future exoplanetary missions.
4. Also all the important exoplanetary objects such as black holes, stars, big asteroids which are under observations because of their unique behaviour and their potential to impact the nearby galaxies in any way will also be documented in the system along with their detailed description.
5. We will also keep a functionality which enables scientists to automatically get notified about some new event in the exoplanetary objects specified above. This will

include, asteroids coming very near to earth, supernova explosions, change in strength of blackholes and more.
6. Also, various experiments being conducted by rovers, satellites will also be mentioned in the system.
7. The system will be part wise accessible to ISRO personnel according to their clearance.

1.2 PRODUCT SCOPE

- Keep track of satellite health, positions and services.
- It should also keep track of stars, planets, black holes, moving stars, big asteroids and notify the scientists when some event occurs, or alert about the future collisions with earth or other entities.
- This system should be able keep track of their experiment and outcomes.
- When needs arise different agencies should be able to work-together to complete the mission by sharing information from this system.
- We are going to make a product which will carry data about ISRO missions name,launching data,launching vehicle and mission outcomes.
- This system can be used to share data to various private sector space agencies on a controlled basis by making them pay a fee for the same.
- Also, other space agencies can collaborate on similar objectives of some

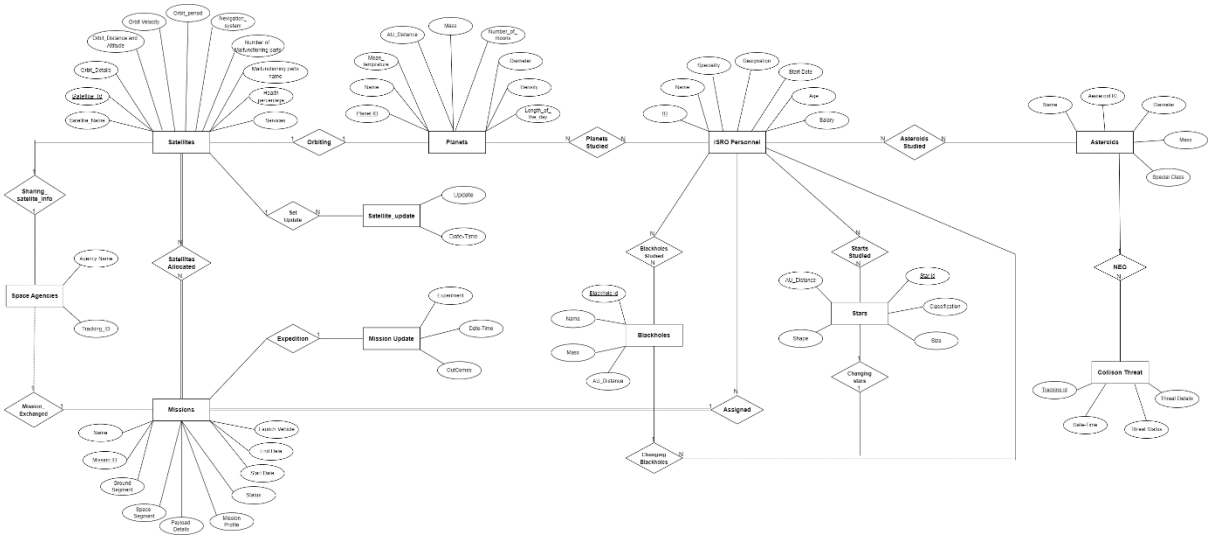
Chapter 2

SYSTEM DESIGN

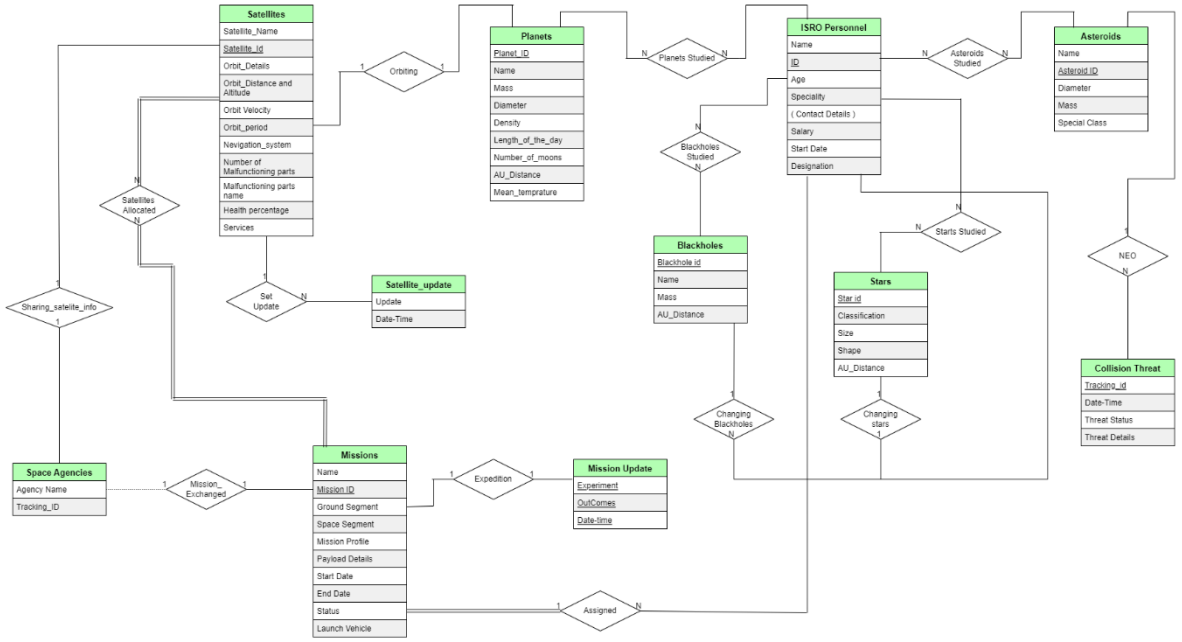
Design a system that helps space agencies like ISRO, NASA to track their missions, findings, and space element movements.

2.1 ER DIAGRAM

ENITITY-RELATIONSHIP DIAGRAM



RELATIONAL DIAGRAM



2.2 NORMALIZATION AND NORMAL FORMS

(i) Mapping E-R Model to Relational Model

ISRO Personnel(ID, Name, Designation, Age, Speciality, Salary, Start-Date)

Personnel_Details(Personnel_Id, Phone_Number)

Space Agencies(Tracking_ID, Agencies_Name, Satellite_id, Mission_id)

Planet(Planet_id, name, mass, Diameter, Density,length_of_the_day,number_of _moons, AU-distance, Mean_temprature)

Planet_studied(Planet_id, Personnel_id)

Stars(Star_ID, Classification, Size, Shape, AU_Distance)

Star_studied(Star_id, Personnel_id)

Blackholes(Blackhole ID, Planets_ID, Name, Mass, AU_Distance)

Blackhole_studied(Blackhole_id, Personnel_id)

Asteroids(Asteroid Id , Asteroid Name, Diameter, Mass, Spectral class)

Asteroids_Studied(Asteroid_ID, Personnel_ID)

Missions(Mission ID, Launch Vehicle, Ground Segment, Mission profile, Payload details, Start Date, Enddate, Status)

Assigned(Mission_id, Personnel_id)

Mission_update(Mission_id, Experiment, outcomes, date_time)

Satellites(Satelite_ID, Satellite_Name, Orbit Details, Orbit_Distance and Altitude, Orbit Velocity, Orbit_period, Navigation System, Number of malfunctioning parts, malfunctioning parts name, Health Percentage, Services, Planet_ID)

Satellite_allocated(Satllite_id, Mission_id)

Satellite_update(satellite_id, update, date_time)

Collision Threat(Tracking ID, Threat Status, Threat Details, Date-Time, Asteroid_id)

(ii) PK dependency

- Satellite_Id - Satellites
- Personnel_ID - ISRO Personnel
- Planet_id - Planet
- Mission ID - Missions
- Star_id - Stars
- Blackhole ID - Blackholes
- Asteroid Id - Asteroids
- Personnel_Id,Phone_Number - Personnel_Details
- Tracking ID - Collision Threat
- (Alert_id,Personnel_id) - Alert_assigned
- Tracking_ID - Space Agencies
- (Mission_id,Date_Time,Experiments,Outcomes) - Mission Updates
- (Satellite_id,Update,Date-Time) - Satellite Updates
- (Blackhole_id,Personnel_id) - Blackhole_studied
- (Asteroid_ID,Personnel_ID) - Asteroids_Studied
- (Star_id,Personnel_id) - Star_studied
- (Mission_id,Personnel_id) - Assigned
- (Planet_id,Personnel_id) - Planet_studied
- (Satllite_id,Mission_id) - Satellite_allocated

(iii) FK dependencies

- **Planet_ID** references to **Satellite, Planet_Studied**
- **Satellite_ID** references to **Satellite_Updates, Satellite_Allocate, Space_Agencies**
- **Mission_ID** references to **Satellite_Allocate, Space_Agencies, Mission_updates, Assigned**
- **Personnel_ID** references to **Planet_Studied, Blackhole_Studied, Asteroids_Studied, Star_Studied, Assigned, Personnel_Studied**
- **Blackhole_ID** references to **Blackhole_Studied**

- **Star_ID** references to **Star_Studied**
- **Asteroid_ID** references to **Asteroids_Studied, Collision_Threat**

(iv) Normalization Forms

1 NF

No composite and multivalued attributes in our database.

2 NF

We don't have Composite primary keys that are partial. So our schema is in 2NF already.

3NF

Our database is only in 3 NF.

Chapter 3

DEVELOPMENT PROCESS

Development process and documentation are one of the activities in the software development life cycle. Development processes include requirement analysis, technologies used to implement the project, design and implementation.

3.1 HARDWARE AND SOFTWARE REQUIREMENTS

Software requirements:-

- PGSQL / MYSQL

Hardware requirements:-

- Processor: Intel i3
- Hard Disk: 500 GB
- RAM: 2 GB
- Cache Memory: 512KB
- Operating System: Windows XP/ Windows7

3.2 DATABASE TABLES DESIGN

The design phase is one of the most important phases of software development. In this phase the project modules are identified. The design itself gives half the solution to the project. Database Design is a collection of processes that facilitate the designing, development, implementation and maintenance of enterprise data management systems.

Table 3.1 Table stores data of ISRO_PERSONNEL;

```
mysql> DESC AGENCY_AND_PERSONNEL.ISRO_PERSONNEL;
+-------------+----------+------+-----+---------+-------+
| Field       | Type     | Null | Key | Default | Extra |
+-------------+----------+------+-----+---------+-------+
| id          | int      | NO   | PRI | NULL    |       |
| name        | char(50) | NO   |     | NULL    |       |
| designation | char(50) | NO   |     | NULL    |       |
| age         | int      | NO   |     | NULL    |       |
| salary      | bigint   | YES  |     | NULL    |       |
| start_date  | date     | NO   |     | NULL    |       |
+-------------+----------+------+-----+---------+-------+
6 rows in set (0.00 sec)
```

Table 3.2 Table stores data of PERSONNEL_DETAILS;

```
mysql> DESC AGENCY_AND_PERSONNEL.PERSONNEL_DETAILS;
+--------------+----------+------+-----+---------+-------+
| Field        | Type     | Null | Key | Default | Extra |
+--------------+----------+------+-----+---------+-------+
| personnel_id | int      | NO   | PRI | NULL    |       |
| phone_number | char(10) | NO   | PRI | NULL    |       |
+--------------+----------+------+-----+---------+-------+
2 rows in set (0.00 sec)
```

Table 3.3 Table stores data of SPACE_AGENCIES;

```
mysql> DESC AGENCY_AND_PERSONNEL.SPACE_AGENCIES;
+---------------+--------------+------+-----+---------+-------+
| Field         | Type         | Null | Key | Default | Extra |
+---------------+--------------+------+-----+---------+-------+
| tracking_id   | int          | NO   | PRI | NULL    |       |
| agency_name   | varchar(100) | YES  |     | NULL    |       |
| satellite__id | int          | YES  | MUL | NULL    |       |
| mission__id   | int          | YES  | MUL | NULL    |       |
+---------------+--------------+------+-----+---------+-------+
4 rows in set (0.00 sec)
```

Table 3.4 Table stores data of MISSIONS;

```
mysql> DESC MISSIONS.MISSIONS;
+-----------------+-------------+------+-----+---------+-------+
| Field           | Type        | Null | Key | Default | Extra |
+-----------------+-------------+------+-----+---------+-------+
| mission_id      | int         | NO   | PRI | NULL    |       |
| launch_vehicle  | varchar(50) | YES  |     | NULL    |       |
| ground_segment  | varchar(50) | YES  |     | NULL    |       |
| mission_profile | varchar(100)| YES  |     | NULL    |       |
| payload_details | varchar(100)| YES  |     | NULL    |       |
| start_date      | date        | YES  |     | NULL    |       |
| end_date        | date        | YES  |     | NULL    |       |
| status          | varchar(50) | YES  |     | NULL    |       |
+-----------------+-------------+------+-----+---------+-------+
8 rows in set (0.00 sec)
```

Table 3.5 Table stores data of MISSION_ASSIGNED;;

```
mysql> DESC MISSIONS.MISSION_ASSIGNED;
+---------------+------+------+-----+---------+-------+
| Field         | Type | Null | Key | Default | Extra |
+---------------+------+------+-----+---------+-------+
| mission_id_   | int  | NO   | PRI | NULL    |       |
| personnel_id_ | int  | NO   | PRI | NULL    |       |
+---------------+------+------+-----+---------+-------+
2 rows in set (0.00 sec)
```

Table 3.6 Table stores data of MISSION_UPDATE;

```
mysql> DESC MISSIONS.MISSION_UPDATE;
+-------------+-------------+------+-----+---------+-------+
| Field       | Type        | Null | Key | Default | Extra |
+-------------+-------------+------+-----+---------+-------+
| mission_id  | int         | NO   | PRI | NULL    |       |
| date-time   | date        | NO   | PRI | NULL    |       |
| experiments | varchar(150)| NO   | PRI | NULL    |       |
| outcomes    | varchar(50) | NO   | PRI | NULL    |       |
+-------------+-------------+------+-----+---------+-------+
4 rows in set (0.00 sec)
```

Table 3.7 Table stores data of STARS;

```
mysql> DESC PABS.STARS;
+----------------+-------------+------+-----+---------+-------+
| Field          | Type        | Null | Key | Default | Extra |
+----------------+-------------+------+-----+---------+-------+
| star_id        | int         | NO   | PRI | NULL    |       |
| Classification | char(50)    | YES  |     | NULL    |       |
| size           | bigint      | YES  |     | NULL    |       |
| shape          | varchar(45) | YES  |     | NULL    |       |
| AU_distance    | int         | YES  |     | NULL    |       |
+----------------+-------------+------+-----+---------+-------+
5 rows in set (0.00 sec)
```

Table 3.8 Table stores data of STAR_STUDIED;

```
mysql> DESC PABS.STAR_STUDIED;
+--------------+------+------+-----+---------+-------+
| Field        | Type | Null | Key | Default | Extra |
+--------------+------+------+-----+---------+-------+
| star_id      | int  | NO   | PRI | NULL    |       |
| personnel_id | int  | NO   | PRI | NULL    |       |
+--------------+------+------+-----+---------+-------+
2 rows in set (0.00 sec)
```

Table 3.9 Table stores data of ASTEROIDS;

```
mysql> DESC PABS.ASTEROIDS;
+----------------+-------------+------+-----+---------+-------+
| Field          | Type        | Null | Key | Default | Extra |
+----------------+-------------+------+-----+---------+-------+
| asteroid_id    | int         | NO   | PRI | NULL    |       |
| asteroid_name  | varchar(50) | YES  |     | NULL    |       |
| diameter       | bigint      | YES  |     | NULL    |       |
| mass           | bigint      | YES  |     | NULL    |       |
| spectral class | char(50)    | YES  |     | NULL    |       |
+----------------+-------------+------+-----+---------+-------+
5 rows in set (0.00 sec)
```

Table 3.10 Table stores data of ASTEROID_STUDIED;

```
mysql> DESC PABS.ASTEROID_STUDIED;
+---------------+------+------+-----+---------+-------+
| Field         | Type | Null | Key | Default | Extra |
+---------------+------+------+-----+---------+-------+
| asteroid ID   | int  | NO   | PRI | NULL    |       |
| personnel__ID | int  | NO   | PRI | NULL    |       |
+---------------+------+------+-----+---------+-------+
2 rows in set (0.00 sec)
```

Table 3.11 Table stores data of PLANETS;

```
mysql> DESC PABS.PLANETS;
+------------------+-------------+------+-----+---------+-------+
| Field            | Type        | Null | Key | Default | Extra |
+------------------+-------------+------+-----+---------+-------+
| planet_id        | int         | NO   | PRI | NULL    |       |
| planet_name      | varchar(45) | YES  |     | NULL    |       |
| mass             | double      | YES  |     | NULL    |       |
| diameter         | bigint      | YES  |     | NULL    |       |
| density          | bigint      | YES  |     | NULL    |       |
| length_of_the_day | bigint     | YES  |     | NULL    |       |
| number_of_moons  | bigint      | YES  |     | NULL    |       |
| AU_distance      | double      | YES  |     | NULL    |       |
| mean_temperature | int         | YES  |     | NULL    |       |
+------------------+-------------+------+-----+---------+-------+
9 rows in set (0.00 sec)
```

Table 3.12 Table stores data of PLANET_STUDIED;

```
mysql> DESC PABS.PLANET_STUDIED;
+----------------+------+------+-----+---------+-------+
| Field          | Type | Null | Key | Default | Extra |
+----------------+------+------+-----+---------+-------+
| planet_id      | int  | NO   | PRI | NULL    |       |
| personnel___id | int  | NO   | PRI | NULL    |       |
+----------------+------+------+-----+---------+-------+
2 rows in set (0.00 sec)
```

Table 3.13 Table stores data of BLACKHOLES;

```
mysql> DESC PABS.BLACKHOLES;
+--------------+----------+------+-----+---------+-------+
| Field        | Type     | Null | Key | Default | Extra |
+--------------+----------+------+-----+---------+-------+
| blackhole_id | int      | NO   | PRI | NULL    |       |
| name         | char(50) | YES  |     | NULL    |       |
| mass         | bigint   | YES  |     | NULL    |       |
| AU_distance  | bigint   | YES  |     | NULL    |       |
+--------------+----------+------+-----+---------+-------+
4 rows in set (0.00 sec)
```

Table 3.14 Table stores data of BLACKHOLE_STUDIED;

```
mysql> DESC PABS.BLACKHOLE_STUDIED;
+--------------+------+------+-----+---------+-------+
| Field        | Type | Null | Key | Default | Extra |
+--------------+------+------+-----+---------+-------+
| blackhole id | int  | NO   | PRI | NULL    |       |
| personnel id | int  | NO   | PRI | NULL    |       |
+--------------+------+------+-----+---------+-------+
2 rows in set (0.00 sec)
```

Table 3.15 Table stores data of COLLISION_THREATS;

```
mysql> DESC THREATS.COLLISION_THREATS;
+----------------+----------+------+-----+---------+-------+
| Field          | Type     | Null | Key | Default | Extra |
+----------------+----------+------+-----+---------+-------+
| tracking__id   | int      | NO   | PRI | NULL    |       |
| threat_status  | char(50) | YES  |     | NULL    |       |
| threat_details | char(50) | YES  |     | NULL    |       |
| date-time      | date     | YES  |     | NULL    |       |
| asteroid_id    | int      | NO   | MUL | NULL    |       |
+----------------+----------+------+-----+---------+-------+
5 rows in set (0.00 sec)
```

Table 3.16 Table stores data of SATELLITES;

```
mysql> DESC SATELLITES.SATELLITES;
+-------------------------------+-------------+------+-----+---------+-------+
| Field                         | Type        | Null | Key | Default | Extra |
+-------------------------------+-------------+------+-----+---------+-------+
| satellite_id                  | int         | NO   | PRI | NULL    |       |
| satellite_name                | varchar(50) | YES  |     | NULL    |       |
| orbit_details                 | varchar(50) | YES  |     | NULL    |       |
| orbit_distance                | bigint      | YES  |     | NULL    |       |
| orbit_velocity                | bigint      | YES  |     | NULL    |       |
| orbit_period                  | double      | YES  |     | NULL    |       |
| navigation_system             | varchar(50) | YES  |     | NULL    |       |
| number_of_malfunctioning_parts | bigint      | YES  |     | NULL    |       |
| malfunctioning_parts_name     | varchar(50) | YES  |     | NULL    |       |
| health_percentage             | int         | YES  |     | NULL    |       |
| services                      | varchar(100) | YES  |     | NULL    |       |
| planet_id                     | int         | NO   | MUL | NULL    |       |
+-------------------------------+-------------+------+-----+---------+-------+
12 rows in set (0.00 sec)
```

Table 3.17 Table stores data of SATELLITE_ALLOCATED;

```
mysql> DESC SATELLITES.SATELLITE_ALLOCATED;
+----------------+------+------+-----+---------+-------+
| Field          | Type | Null | Key | Default | Extra |
+----------------+------+------+-----+---------+-------+
| satellite_id_  | int  | NO   | PRI | NULL    |       |
| mission_id_    | int  | NO   | PRI | NULL    |       |
+----------------+------+------+-----+---------+-------+
2 rows in set (0.00 sec)
```

Table 3.18 Table stores data of SATELLITE_UPDATE;

```
mysql> DESC SATELLITES.SATELLITE_UPDATE;
+----------------+-------------+------+-----+---------+-------+
| Field          | Type        | Null | Key | Default | Extra |
+----------------+-------------+------+-----+---------+-------+
| satellite_id__ | int         | NO   | PRI | NULL    |       |
| update         | varchar(45) | NO   | PRI | NULL    |       |
| date-time      | date        | NO   | PRI | NULL    |       |
+----------------+-------------+------+-----+---------+-------+
3 rows in set (0.00 sec)
```

3.3 BACK-END IMPLEMENTATION

We've created 5 Schemas as mentioned below:

1. Agency_and_Personnel
2. Missions
3. PABS
4. Satellites
5. Threats

1. Isro_Personnel

```
CREATE TABLE `isro_personnel` (
  `id` int NOT NULL,
  `name` char(50) NOT NULL,
  `designation` char(50) NOT NULL,
  `age` int NOT NULL,
  `salary` bigint DEFAULT NULL,
  `start_date` date NOT NULL,
  PRIMARY KEY (`id`),
  UNIQUE KEY `id_UNIQUE` (`id`)
) ;
```

```
INSERT INTO `agency_and_personnel`.`isro_personnel` (`id`, `name`, `designation`, `age`, `salary`, `start_date`) VALUES ('101', 'V. Adimurthy', 'Controller', '23', '150000', '2012-04-04');
INSERT INTO `agency_and_personnel`.`isro_personnel` (`id`, `name`, `designation`, `age`, `salary`, `start_date`) VALUES ('102', 'Khushi BP', 'Technical Officer-E', '35', '150000', '2007-05-20');
INSERT INTO `agency_and_personnel`.`isro_personnel` (`id`, `name`, `designation`, `age`, `salary`, `start_date`) VALUES ('103', 'Thekkethil Kochandy Alex', 'Secretary', '50', '120000', '2004-12-07');
```

id	name	designation	age	salary	start_date
101	V. Adimurthy	Controller	23	150000	2012-04-04
102	Khushi BP	Technical Officer-E	35	150000	2007-05-20
103	Thekkethil Kochandy Alex	Secretary	50	120000	2004-12-07
104	Mylswanmy Annadurai	Member (Finance)	42	98000	2003-05-11
105	M. Annamalai	Technical Officer-E	32	87000	2002-08-22
106	Jeel B Patel	Head (OL)	56	260000	2008-12-16
107	R. Aravamudan	Controller	54	88000	2007-08-22
108	Manan M Jagani	Head (OL)	45	225000	2003-12-18
109	V. P. Balagangadharan	Controller	46	110000	2013-07-18
110	John Barnabas	Controller	48	150000	2005-02-14
111	Bharat P Patel	Sr. Head	62	200000	2004-11-09
112	Praful Bhavsar	Member (Finance)	[illegible]	10000	2004-12-23
113	Manish J.	Joint Director (OL)	26	187000	2012-03-17
114	Eknath Vasant Chitnis	Dy. Secretary	39	75000	2009-07-05
115	Maanan M Jagani	Joint Director (OL)	33	5000	2013-12-12
116	V. K. Dadhawal	Dy. Secretary	32	61000	2005-01-15

2. Personnel_Details

```
CREATE TABLE `personnel_details` (
  `personnel_id` int NOT NULL,
  `phone_number` char(10) NOT NULL,
   PRIMARY KEY (`phone_number`,`personnel_id`),
  CONSTRAINT `personnel_id` FOREIGN KEY (`personnel_id`) REFERENCES
  `isro_personnel` (`id`)
);
```

```
INSERT INTO `agency_and_personnel`.`personnel_details` (`personnel_id`, `phone number`) VALUES ('101', '9320492590');
INSERT INTO `agency_and_personnel`.`personnel_details` (`personnel_id`, `phone number`) VALUES ('102', '9399591823');
INSERT INTO `agency_and_personnel`.`personnel_details` (`personnel_id`, `phone number`) VALUES ('103', '9276450933');
```

personnel_id	phone_number
101	9320492590
102	9399591823
103	9276450933
104	9922855906
105	9543873333
106	9489411057
107	9120471833
108	9523587993
109	9094968222
110	9330581857
111	9621698708
112	9017410208
113	9352460369
114	9110079777

3. Stars

```
CREATE TABLE `stars` (
  `star_id` int NOT NULL,
  `Classification` char(50) DEFAULT NULL,
  `size` bigint DEFAULT NULL,
  `shape` varchar(45) DEFAULT NULL,
  `AU_distance` int DEFAULT NULL,
  PRIMARY KEY (`star_id`)
);
```

```
INSERT INTO `pabs`.`stars` (`star_id`, `Classification`, `size`, `shape`,
`AU_distance`) VALUES ('1', 'K', '3971777', 'Decagram', '2321261');
INSERT INTO `pabs`.`stars` (`star_id`, `Classification`, `size`, `shape`,
`AU_distance`) VALUES ('2', 'B', '1114349', 'Polygon', '2647110');
INSERT INTO `pabs`.`stars` (`star_id`, `Classification`, `size`, `shape`,
`AU_distance`) VALUES ('3', 'F', '2756213', 'Pentagram', '4676767');
```

star_id	Classification	size	shape	AU_distance
1	K	3971777	Decagram	2321261
2	B	1114349	Polygon	2647110
3	F	2756213	Pentagram	4676767
4	K	2575787	Heptagram	2653046
5	F	4371375	Heptagram	1941428
6	O	3715211	Enneagram	1339501
7	F	3553896	Polygon	2900705
8	G	3792593	Enneagram	4642900
9	M	2070516	Polygon	1715127
10	M	3471802	Polygon	3729127
11	O	3505028	Pentagram	1172751
12	B	3210263	Handecagram	3444304
13	F	3258859	Heptagram	3638098
14	M	1399728	Heptagram	1409889

4. blackhole

```
CREATE TABLE `star_studied` (
  `star_id` int NOT NULL,
  `personnel_id` int NOT NULL,
  PRIMARY KEY (`star_id`,`personnel_id`),
  KEY `personnel_id` (`personnel_id`),
  CONSTRAINT `personnel_id` FOREIGN KEY (`personnel_id`)
  REFERENCES `agency_and_personnel`.`isro_personnel` (`id`),
  CONSTRAINT `star_id` FOREIGN KEY (`star_id`) REFERENCES `stars` (`star_id`)
```

);

INSERT INTO `pabs`.`blackholes` (`blackhole_id`, `name`, `mass`, `AU_distance`)
VALUES ('301', 'Cygnus X-1', '2593050', '3678189');
INSERT INTO `pabs`.`blackholes` (`blackhole_id`, `name`, `mass`, `AU_distance`)
VALUES ('302', 'SS 433', '4492984', '3072444');
INSERT INTO `pabs`.`blackholes` (`blackhole_id`, `name`, `mass`, `AU_distance`)
VALUES ('303', 'Nova Mon 1975', '4432580', '4167646');

blackhole_id	name	mass	AU_distance
301	Cygnus X-1	2593050	3678189
302	SS 433	4492984	3072444
303	Nova Mon 1975	4432580	4167646
304	Nova Persi 1992	1646729	3221167
305	IL Lupi	3297868	3340556
306	Nova Oph 1977	4336749	1694313
307	V4641 Sgr	4080764	3381097
308	Nova Vul 1988	2020335	1685787
309	V404 Cygni	2366703	2477513
310	NGC-205	3044092	2417095
311	Messier-33	3853898	1830424
312	SgrA*	2299437	3481806
313	Messier-81	3261158	1660566

5. Star Studied

CREATE TABLE `star_studied` (
  `star_id` int NOT NULL,
  `personnel_id` int NOT NULL,
  PRIMARY KEY (`star_id`,`personnel_id`),
  KEY `personnel_id` (`personnel_id`),
  CONSTRAINT `personnel_id` FOREIGN KEY (`personnel_id`)
  REFERENCES `agency_and_personnel`.`isro_personnel` (`id`),
  CONSTRAINT `star_id` FOREIGN KEY (`star_id`) REFERENCES `stars` (`star_id`)
);

INSERT INTO `pabs`.`star_studied` (`star_id`, `personnel_id`) VALUES ('64', '184');
INSERT INTO `pabs`.`star_studied` (`star_id`, `personnel_id`) VALUES ('45', '121');
INSERT INTO `pabs`.`star_studied` (`star_id`, `personnel_id`) VALUES ('86', '115');

star_id	personnel_id
13	102
55	102
87	102
56	104
85	105
43	106
32	108
14	110
37	110
79	110
58	111
24	114
51	114
86	115

6. blackhole_studied

```
CREATE TABLE `blackhole_studied` (
  `blackhole id` int NOT NULL,
  `personnel id` int NOT NULL,
  PRIMARY KEY (`blackhole id`,`personnel id`),
  KEY `personnel id` (`personnel id`),
  CONSTRAINT `blackhole id` FOREIGN KEY (`blackhole id`)
  REFERENCES `blackholes` (`blackhole_id`)
  ON DELETE CASCADE,
  CONSTRAINT `personnel id` FOREIGN KEY (`personnel id`)
  REFERENCES `agency_and_personnel`.`isro_personnel` (`id`)
  ON DELETE CASCADE
);
```

```
INSERT INTO `pabs`.`blackhole_studied` (`blackhole id`, `personnel id`) VALUES
('346', '151');
INSERT INTO `pabs`.`blackhole_studied` (`blackhole id`, `personnel id`) VALUES
('383', '187');
INSERT INTO `pabs`.`blackhole_studied` (`blackhole id`, `personnel id`) VALUES
('364', '106');
```

blackhole id	personnel id
375	101
377	101
334	103
387	103
389	103
302	104
311	104
359	104
378	104
361	106
364	106
364	109
379	109
326	110

7. Asteroids

```
CREATE TABLE `asteroids` (
  `asteroid_id` int NOT NULL,
  `asteroid_name` varchar(50) DEFAULT NULL,
  `diameter` bigint DEFAULT NULL,
  `mass` bigint DEFAULT NULL,
  `spectral class` char(50) DEFAULT NULL,
  PRIMARY KEY (`asteroid_id`)
);


INSERT INTO `pabs`.`asteroids` (`asteroid_id`, `asteroid_name`, `diameter`, `mass`, `spectral class`) VALUES ('1000', '4 Vesta', '529', '25913', 'V');
INSERT INTO `pabs`.`asteroids` (`asteroid_id`, `asteroid_name`, `diameter`, `mass`, `spectral class`) VALUES ('1001', 'Queen Alexandra Range 99018', '430', '31698', 'F');
INSERT INTO `pabs`.`asteroids` (`asteroid_id`, `asteroid_name`, `diameter`, `mass`, `spectral class`) VALUES ('1002', 'Novy-Projekt', '835', '39650', 'V');
```

asteroid_id	asteroid_name	diameter	mass	spectral class
1000	4 Vesta	529	25913	V
1001	Queen Alexandra Range 99...	430	31698	F
1002	Novy-Projekt	835	39650	V
1003	Dar al Gani 369	117	29675	F
1004	Dhofar 066	876	10828	S
1005	Jiddat al Harasis 013	969	11583	B
1006	Northwest Afrika 1463	360	36343	P
1007	Rio Rancho	856	49321	P
1008	Hammadah al Hamra 048	289	27592	D
1009	Northwest Africa 1499	918	48507	P
1010	Ramlat as Sahmah 320	384	20433	B
1011	Valdinizza	874	45905	P
1012	Northwest Africa 2226	657	22767	C
1013	Northwest Africa 7479	938	20584	C

8. Asteroid_studied

```
CREATE TABLE `asteroid_studied` (
  `asteroid ID` int NOT NULL,
  `personnel__ID` int NOT NULL,
  PRIMARY KEY (`asteroid ID`,`personnel__ID`),
  KEY `personnel__ID` (`personnel__ID`),
  CONSTRAINT `asteroid ID` FOREIGN KEY (`asteroid ID`)
  REFERENCES `asteroids` (`asteroid_id`)
  ON DELETE CASCADE,
  CONSTRAINT `personnel__ID` FOREIGN KEY (`personnel__ID`)
  REFERENCES `agency_and_personnel`.`isro_personnel` (`id`)
  ON DELETE CASCADE
);

INSERT INTO `pabs`.`asteroid_studied` (`asteroid ID`, `personnel__ID`) VALUES
('1000', '101');
INSERT INTO `pabs`.`asteroid_studied` (`asteroid ID`, `personnel__ID`) VALUES
('1001', '102');
INSERT INTO `pabs`.`asteroid_studied` (`asteroid ID`, `personnel__ID`) VALUES
('1002', '103');
```

asteroid ID	personnel__ID
1000	101
1100	101
1001	102
1002	103
1003	104
1004	105
1005	106
1006	107
1007	108
1008	109
1009	110
1010	111
1011	112
1012	113

9. Planets

```
CREATE TABLE `planets` (
  `planet_id` int NOT NULL,
  `planet_name` varchar(45) DEFAULT NULL,
  `mass` double DEFAULT NULL,
  `diameter` bigint DEFAULT NULL,
  `density` bigint DEFAULT NULL,
  `length_of_the_day` bigint DEFAULT NULL,
  `number_of_moons` bigint DEFAULT NULL,
  `AU_distance` double DEFAULT NULL,
  `mean_temperature` int DEFAULT NULL,
  PRIMARY KEY (`planet_id`)
);

INSERT INTO `pabs`.`planets` (`planet_id`, `planet_name`, `mass`, `diameter`, `density`, `length_of_the_day`, `number_of_moons`, `AU_distance`, `mean_temperature`) VALUES ('401', 'Mercury', '0.33', '4879', '5427', '4223', '0', '0.39', '167');
INSERT INTO `pabs`.`planets` (`planet_id`, `planet_name`, `mass`, `diameter`, `density`, `length_of_the_day`, `number_of_moons`, `AU_distance`, `mean_temperature`) VALUES ('402', 'Venus', '4.87', '12104', '5243', '2802', '0', '0.723', '464');
INSERT INTO `pabs`.`planets` (`planet_id`, `planet_name`, `mass`, `diameter`, `density`, `length_of_the_day`, `number_of_moons`, `AU_distance`, `mean_temperature`) VALUES ('403', 'Moon', '0.0073', '3475', '3340', '709', '0', '0.0025', '-20');
```

planet_id	planet_name	mass	diameter	density	length_of_the_day	number_of_moons	AU_distance	mean_temperature
401	Mercury	0.33	4879	5427	4223	0	0.39	167
402	Venus	4.87	12104	5243	2802	0	0.723	464
403	Moon	0.0073	3475	3340	709	0	0.0025	-20
404	Mars	0.642	6792	3933	25	2	1.524	-65
405	Jupiter	1898	142984	1326	10	79	5.203	-110
406	Saturn	568	120535	687	11	82	9.539	-140
407	Uranus	86.8	51118	1271	17	27	19.18	-195
408	Neptune	102	49528	51118	16	14	30.06	-200
409	Pluto	0.0146	2370	2095	153	5	247.7	-225
NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

10. Planet_studied

```
CREATE TABLE `planet_studied` (
  `planet_id` int NOT NULL,
  `personnel___id` int NOT NULL,
  PRIMARY KEY (`planet_id`,`personnel___id`),
  KEY `personnel___id` (`personnel___id`),
  CONSTRAINT `personnel___id` FOREIGN KEY (`personnel___id`)
  REFERENCES `agency_and_personnel`.`isro_personnel` (`id`)
  ON DELETE CASCADE,
  CONSTRAINT `planet_id` FOREIGN KEY (`planet_id`)
  REFERENCES `planets` (`planet_id`)
  ON DELETE CASCADE
);
```

```
INSERT INTO `pabs`.`planet_studied` (`planet_id`, `personnel___id`) VALUES
('401', '101');
INSERT INTO `pabs`.`planet_studied` (`planet_id`, `personnel___id`) VALUES
('402', '102');
INSERT INTO `pabs`.`planet_studied` (`planet_id`, `personnel___id`) VALUES
('403', '103');
```

planet_id	personnel___id
401	101
402	102
403	103
404	104
405	105
406	106
407	107
408	108
409	109
401	110
402	111
403	112
404	113
405	114
406	115
407	116

11. Missions

```
CREATE TABLE `missions` (
  `mission_id` int NOT NULL,
  `launch_vehicle` varchar(50) DEFAULT NULL,
  `ground_segment` varchar(50) DEFAULT NULL,
  `mission_profile` varchar(100) DEFAULT NULL,
  `payload_details` varchar(100) DEFAULT NULL,
  `start_date` date DEFAULT NULL,
  `end_date` date DEFAULT NULL,
  `status` varchar(50) DEFAULT NULL,
  PRIMARY KEY (`mission_id`)
);
```

```
INSERT INTO `missions`.`missions` (`mission_id`, `launch_vehicle`, `ground_segment`, `mission_profile`, `payload_details`, `start_date`, `end_date`, `status`) VALUES ('10078', 'GSLV MK II', 'ATLAS Global Network', 'ISS assembly flight ULF2: MPLM Leonardo', 'Neuron Spectrometer, MEV GEV', '2016-06-17', '2023-03-14', 'INACTIVE');
INSERT INTO `missions`.`missions` (`mission_id`, `launch_vehicle`, `ground_segment`, `mission_profile`, `payload_details`, `start_date`, `end_date`, `status`) VALUES ('10076', 'Atlas SLV-3', 'ATLAS Global Network', 'Explore ice caps of Moons far side', 'Hyperspectral Imager for the Coastal Ocean on the International Space Station', '2009-10-06', '1996-08-28', 'COMPLETED');
INSERT INTO `missions`.`missions` (`mission_id`, `launch_vehicle`, `ground_segment`, `mission_profile`, `payload_details`, `start_date`, `end_date`, `status`) VALUES ('10062', 'GSLV Mk I', 'ISIS Small satellite Ground Station', 'ISS assembly flight ULF2  MPLM Leonardo', 'Dual Frequency Synthetic Aperture Radar Atmospheric Compositional Explorer', '2024-12-24', '2003-09-28', 'INACTIVE');
```

mission_id	launch_vehicl	ground_segment	mission_profile	payload_details	start_date	end_date	status
10000	Ares IV	OSAGS	Explore ice caps of Moon's far side	Methane Sensor,Mars Color Camera,Lyman Alpha Photometer,Mars Exos…	1998-09-24	2002-10-25	INACTIVE
10001	PSLV-G	OSAGS	Collect sample from Asteroid Bennu AXCV1258	Lunar Gravity Mapper	2014-09-18	1996-05-20	SCHEDULED
10002	Ares I	KSAT Lite	Study Oort Clouds gamma ray beat	Cross-track Infrared Sounder Flying on NOAA/NASA ,GIFTS	1998-08-26	2012-06-30	ACTIVE
10003	PSLV-CA	GAMALINK	Search for pockets of water below mars surface	Secondary Ion MAss Spectrometer, Electrostatic Zoom Digicon Imager	2005-08-25	2001-08-09	INACTIVE
10004	PSLV-3S	GAMALINK	Dragonfly mission to study titan, Saturn's moon	Methane Sensor,Mars Color Camera,Lyman Alpha Photometer,Mars Exos…	2003-08-30	2006-12-01	ACTIVE
10005	Atlas SLV-3B	ISIS Small satellite Ground …	ISS assembly flight ULF2: MPLM Leonardo	Neuron Spectrometer, MEV_GEV	2023-12-20	2004-03-05	INACTIVE
10006	M-3SII	ISIS Small satellite Ground …	Study planet formatiom, how life rose on earth in early solar …	Cross-track Infrared Sounder Flying on NOAA/NASA ,GIFTS	2004-09-14	2002-09-10	COMPLETED
10007	GSLV Mk I	KSAT Lite	Study Oort Cloud's gamma ray beat	Neuron Spectrometer, MEV_GEV	2001-10-06	2015-07-02	INACTIVE
10008	PSLV-ca	OSAGS	Tracking and data relay satellite TDRS-G deployment	Cross-track Infrared Sounder Flying on NOAA/NASA ,GIFTS	2018-12-07	2023-02-28	COMPLETED
10009	GSLV Mk II	ISIS Small satellite Ground …	Experiments aboard Space Radar Laboratory-2	Hyperspectral Imager for the Coastal Ocean on the International Space S…	1995-03-27	2007-08-05	ACTIVE
10010	Ares III	Surrey Ground segment	Dragonfly mission to study titan, Saturn's moon	Cadmium Zinc Telluride Meter	1997-04-09	2020-05-27	SCHEDULED
10011	Atlas LV-3B	ATLAS Global Network	Study Oort Cloud's gamma ray beat	Hyperspectral Imager for the Coastal Ocean on the International Space S…	1998-10-13	2005-08-27	COMPLETED
10012	PSLV-3S	KSAT Lite	Study Oort Cloud's gamma ray beat	Lunar Gravity Digicon Imager, Global Elemental, compostion package, Mer…	2006-11-05	2010-05-20	ACTIVE

12. Mission_Updates

```
CREATE TABLE `mission_update` (
  `mission_id` int NOT NULL,
  `date-time` date NOT NULL,
  `experiments` varchar(150) NOT NULL,
  `outcomes` varchar(50) NOT NULL,
```

```
  PRIMARY KEY (`mission_id`,`date-time`,`experiments`,`outcomes`),
  CONSTRAINT `mission_id` FOREIGN KEY (`mission_id`)
  REFERENCES `missions` (`mission_id`)
  ON DELETE CASCADE
);
```

```
INSERT INTO `missions`.`mission_update` (`mission_id`, `date-time`, `experiments`, `outcomes`) VALUES ('10000', '2019-11-07', 'Sols 2945-2946: Should We Stay or Should We Go?', 'Mission Failed due to technical issue');

INSERT INTO `missions`.`mission_update` (`mission_id`, `date-time`, `experiments`, `outcomes`) VALUES ('10001', '2019-07-28', 'Sols 2919-2920: Penultimate Plan', 'Mission Pending');

INSERT INTO `missions`.`mission_update` (`mission_id`, `date-time`, `experiments`, `outcomes`) VALUES ('10002', '2017-03-30', 'Sols 2940-2941: Curiosity Eyes a Comfortable 'Bench' to Park on for the Weekend', 'Mission Successful');
```

mission_id	date-time	experiments	outcomes
10000	2019-11-07	Sols 2945-2946: Should We Stay or Should We Go?	Mission Failed due to technical issue
10001	2019-07-28	Sols 2919-2920: Penultimate Plan	Mission Pending
10002	2017-03-30	Sols 2940-2941: Curiosity Eyes a Comfortable 'Bench' to Park on for the Weekend	Mission Successful
10003	2019-12-01	Sol 2924: Maybe 'Maybole'...	Mission Cancelled by agency
10004	2018-11-05	Sols 2947-48: Follow the Red Brick Road	Mission Successful
10005	2015-01-02	Sol 2925: 'Maybole,' Up Close and Personal	Mission Pending
10006	2015-08-29	Sols 2945-2946: Should We Stay or Should We Go?	Mission Pending
10007	2018-04-08	Sols 2945-2946: Should We Stay or Should We Go?	Mission Successful
10008	2015-04-11	Sols 2921-2923: On the Road Again!	Mission Cancelled by agency
10009	2016-02-14	Sols 2921-2923: On the Road Again!	Mission Cancelled by agency
10010	2015-05-25	Sols 2951-2953: Pre-Holiday Scramble	Mission Pending
10011	2016-01-06	Sol 2924: Maybe 'Maybole'...	Mission Successful
10012	2018-07-02	Sols 2945-2946: Should We Stay or Should We Go?	Mission Cancelled by agency

13. Satellites

```
CREATE TABLE `satellites` (
  `satellite_id` int NOT NULL,
  `satellite_name` varchar(50) DEFAULT NULL,
  `orbit_details` varchar(50) DEFAULT NULL,
  `orbit_distance` bigint DEFAULT NULL,
  `orbit_velocity` bigint DEFAULT NULL,
  `orbit_period` double DEFAULT NULL,
  `navigation_system` varchar(50) DEFAULT NULL,
  `number_of_malfunctioning_parts` bigint DEFAULT NULL,
  `malfunctioning_parts_name` varchar(50) DEFAULT NULL,
  `health_percentage` int DEFAULT NULL,
  `services` varchar(100) DEFAULT NULL,
  `planet_id` int NOT NULL,
  PRIMARY KEY (`satellite_id`),
  KEY `planet_id` (`planet_id`),
  CONSTRAINT `planet_id` FOREIGN KEY (`planet_id`)
  REFERENCES `pabs`.`planets` (`planet_id`)
  ON DELETE CASCADE
);
```

INSERT INTO `satellites`.`satellites` (`satellite_id`, `satellite_name`, `orbit_details`, `orbit_distance`, `orbit_velocity`, `orbit_period`, `navigation_system`, `number_of_malfunctioning_parts`, `malfunctioning_parts_name`, `health_percentage`, `services`, `planet_id`) VALUES ('500', 'HYLAS 4', 'Polar', '1077', '7162', '100', 'GPS', '41', 'Nav Computer', '82', 'Next generation expected to last to 2030', '405');

INSERT INTO `satellites`.`satellites` (`satellite_id`, `satellite_name`, `orbit_details`, `orbit_distance`, `orbit_velocity`, `orbit_period`, `navigation_system`, `number_of_malfunctioning_parts`, `malfunctioning_parts_name`, `health_percentage`, `services`, `planet_id`) VALUES ('501', 'SOHLA 1', 'Non-Polar Inclined', '599', '7634', '1436.08', 'QZSS', '14', 'Nav Computer', '79', 'X and Ka-band transponders. Will replace DSCS system.', '405');

INSERT INTO `satellites`.`satellites` (`satellite_id`, `satellite_name`, `orbit_details`, `orbit_distance`, `orbit_velocity`, `orbit_period`, `navigation_system`, `number_of_malfunctioning_parts`, `malfunctioning_parts_name`, `health_percentage`, `services`, `planet_id`) VALUES ('503', 'Can-X-4', 'Non-Polar Inclined', '560', '7075', '94.02', 'Galileo', '40', 'Buffer Battery', '80', 'First dedicated astrophysics observatory put into space', '407');

satellite_ic	satellite_name	orbit_details	orbit_distance	orbit_velocity	orbit_period	navigation_system	number_of_malfunct	malfunctioning_parts_nam	health_percer	services	planet_id
500	HYLAS 4	Polar	1077	7162	100	GPS	41	Nav Computer	82	Next generation expected to last to 2030	405
501	SOHLA 1	Non-Polar Inclined	599	7634	1436.08	QZSS	14	Nav Computer	79	X and Ka-band transponders. Will replace DSCS system.	405
503	Can-X4	Non-Polar Inclined	560	7075	94.02	Galileo	40	Buffer Battery	80	First dedicated astrophysics observatory put into space	407
504	Lemur-2-Marshall	Sun-Synchronous	1167	7053	93.2	NAVIC	17	Antenna System	94	Totally dedicated to broadband internet services; total CONUS coverage.	406
505	SB-WASS 3-8	Non-Polar Inclined	1325	6248	1436.12	Galileo	34	Power System	74	Second in series.	404
506	Starlink-1043	Non-Polar Inclined	1157	7980	109.4	GPS	16	Encoder	75	Training satellite; carries an amateur radio payload.	409
507	Dove 3r-1	Sun-Synchronous	1319	6052	94.7	GLONASS	43	Nav Computer	78	Will receive transmissions from ground stations for fighting wildfires.	406
508	Yunhai-2 06	Sun-Synchronous	743	6634	90.6	BeiDou	27	Buffer Battery	82	ELINT.	402
509	Starlink-1193	Sun-Synchronous	767	6762	93.8	BeiDou	26	Encoder	68	Provides tactical intelligence focused support to broad community of users	405
510	Starlink-1145	Non-Polar Inclined	1223	6957	111.8	NAVIC	28	Antenna System	71	Support Geographical Information Systems, environmental, agricultural and oceano...	403
511	Starlink-1102	Non-Polar Inclined	1299	7421	95.6	Galileo	28	Command and Control ...	84	32 Ku-band, 24 C-band and 2 Ka-band transponders; voice and video throughout N...	409
512	GSAT-12	Polar	1380	6658	1435.92	QZSS	48	Fixing Transmitter	77	First of five Germany surveillance satellites; 1-m resolution images.	409
513	Starlink-1166	Sun-Synchronous	818	6505	90.3	GLONASS	35	Signal Receiver	92	Cubesat designed to survive entry into Earth's atmosphere	403
514	Lemur-2-Pappy	Non-Polar Inclined	1001	7884	96.47	Galileo	11	Nav Computer	86	Space weather and ionospheric research mission.	405

14. Space_Agencies

```
CREATE TABLE `space_agencies` (
  `tracking_id` int NOT NULL,
  `agency_name` varchar(100) DEFAULT NULL,
  `satellite__id` int DEFAULT NULL,
  `mission__id` int DEFAULT NULL,
  PRIMARY KEY (`tracking_id`),
  KEY `satellite__id` (`satellite__id`),
  KEY `mission__id` (`mission__id`),
  CONSTRAINT `mission__id` FOREIGN KEY (`mission__id`)
  REFERENCES `missions`.`missions` (`mission_id`)
  ON DELETE CASCADE,
  CONSTRAINT `satellite__id` FOREIGN KEY (`satellite__id`)
  REFERENCES `satellites`.`satellites` (`satellite_id`)
  ON DELETE CASCADE
);
```

INSERT INTO `agency_and_personnel`.`space_agencies` (`tracking_id`, `agency_name`, `satellite__id`, `mission__id`) VALUES ('1000', 'Australian Space Agency', '541', '10078');

INSERT INTO `agency_and_personnel`.`space_agencies` (`tracking_id`, `agency_name`, `satellite__id`, `mission__id`) VALUES ('1001', 'Mohammed bin Rashid Space Centre', '588', '10076');

INSERT INTO `agency_and_personnel`.`space_agencies` (`tracking_id`, `agency_name`, `satellite__id`, `mission__id`) VALUES ('1002', 'Belarus Space Agency', '528', '10062');

tracking_id	agency_name	satellite__id	mission__id
1000	Australian Space Agency	541	10078
1001	Mohammed bin Rashid Space Centre	588	10076
1002	Belarus Space Agency	528	10062
1003	United Arab Emirates Space Agency	593	10001
1004	Central American Association for Aeronautics and Space	506	10070
1005	United Nations Committee on the Peaceful Uses of Outer Space	517	10077
1006	Croatian Space Agency	556	10025
1007	Mexican Space Agency	573	10022
1008	United Nations Office for Outer Space Affairs	515	10036
1009	Algerian Space Agency	513	10083
1010	Turkmenistan National Space Agency	519	10014
1011	Asia-Pacific Space Cooperation Organization	540	10024
1012	Austrian Space Agency	571	10063

15. Mission_assigned

```
CREATE TABLE `mission_assigned` (
  `mission_id_` int NOT NULL,
  `personnel_id_` int NOT NULL,
  PRIMARY KEY (`mission_id_`,`personnel_id_`),
  KEY `personnel_id_` (`personnel_id_`),
  CONSTRAINT `mission_id_` FOREIGN KEY (`mission_id_`)
  REFERENCES `missions` (`mission_id`)
  ON DELETE CASCADE,
  CONSTRAINT `personnel_id_` FOREIGN KEY (`personnel_id_`)
  REFERENCES `agency_and_personnel`.`isro_personnel` (`id`)
  ON DELETE CASCADE
);
```

```
INSERT INTO `missions`.`mission_assigned` (`mission_id_`, `personnel_id_`)
VALUES ('10078', '101');
INSERT INTO `missions`.`mission_assigned` (`mission_id_`, `personnel_id_`)
VALUES ('10076', '102');
INSERT INTO `missions`.`mission_assigned` (`mission_id_`, `personnel_id_`)
VALUES ('10062', '103');
```

mission_id_	personnel_id_
10078	101
10076	102
10062	103
10001	104
10070	105
10070	106
10025	107
10022	108
10036	109
10083	110
10014	111
10024	112
10063	113
10005	114

16. Collision_Threat

```
CREATE TABLE `collision_threats` (
  `tracking__id` int NOT NULL,
  `threat_status` char(50) DEFAULT NULL,
  `threat_details` char(50) DEFAULT NULL,
  `date-time` date DEFAULT NULL,
  `asteroid_id` int NOT NULL,
  PRIMARY KEY (`tracking__id`),
  KEY `asteroid_id` (`asteroid_id`),
  CONSTRAINT `asteroid_id` FOREIGN KEY (`asteroid_id`)
  REFERENCES `pabs`.`asteroids` (`asteroid_id`)
  ON DELETE CASCADE
);

INSERT INTO `threats`.`collision_threats` (`tracking__id`, `threat_status`,
`threat_details`, `date-time`, `asteroid_id`) VALUES ('65000', 'Low Tier', 'Low
Neutrino Burst', '2015-02-25', '1030');
INSERT INTO `threats`.`collision_threats` (`tracking__id`, `threat_status`,
`threat_details`, `date-time`, `asteroid_id`) VALUES ('65001', 'Simple Warning', 'High
Neutrion Burst', '2020-05-02', '1059');
INSERT INTO `threats`.`collision_threats` (`tracking__id`, `threat_status`,
`threat_details`, `date-time`, `asteroid_id`) VALUES ('65002', 'High Tier', 'High
Neutrion Burst', '2020-11-01', '1077');
```

tracking__id	threat_status	threat_details	date-time	asteroid_id
65000	Low Tier	Low Neutrino Burst	2015-02-25	1030
65001	Simple Warning	High Neutrion Burst	2020-05-02	1059
65002	High Tier	High Neutrion Burst	2020-11-01	1077
65003	Tackled/Over	Space GPS jamming by external entity	2011-01-14	1012
65004	Supernova	Supernova	2016-09-10	1042
65005	Medium Tier	Debris Alert for Sats	2019-07-31	1075
65006	Imminent	Space GPS jamming by external entity	2013-07-13	1097
65007	Medium Tier	bad upper layer space weather	2011-11-09	1001
65008	Tackled/Over	Supernova	2020-05-18	1018
65009	Low Tier	Debris Alert for Sats	2013-11-15	1085
65010	Tackled/Over	Supernova	2007-09-21	1090
65011	Medium Tier	Asteroid Collision	2012-01-15	1007
65012	Simple Warning	Asteroid Collision	2013-12-04	1028

17. Satellite_allocated

```
CREATE TABLE `satellite_allocated` (
  `satellite_id_` int NOT NULL,
  `mission_id_` int NOT NULL,
  PRIMARY KEY (`satellite_id_`,`mission_id_`),
  KEY `mission_id_` (`mission_id_`),
  CONSTRAINT `mission_id_` FOREIGN KEY (`mission_id_`)
  REFERENCES `missions`.`missions` (`mission_id`)
  ON DELETE CASCADE,
  CONSTRAINT `satellite_id_` FOREIGN KEY (`satellite_id_`)
  REFERENCES `satellites` (`satellite_id`)
  ON DELETE CASCADE
);
```

```
INSERT INTO `satellites`.`satellite_allocated` (`satellite_id_`, `mission_id_`)
VALUES ('541', '10078');
INSERT INTO `satellites`.`satellite_allocated` (`satellite_id_`, `mission_id_`)
VALUES ('588', '10076');
INSERT INTO `satellites`.`satellite_allocated` (`satellite_id_`, `mission_id_`)
VALUES ('528', '10062');
```

satellite_id_	mission_id_
564	10000
593	10001
514	10002
572	10003
526	10004
539	10005
585	10006
576	10007
562	10008
516	10009
529	10010
597	10011
535	10012

18. Satellie_Updates

```
CREATE TABLE `satellite_update` (
  `satellite_id__` int NOT NULL,
  `update` varchar(45) NOT NULL,
  `date-time` date NOT NULL,
  PRIMARY KEY (`satellite_id__`,`update`,`date-time`),
  CONSTRAINT `satellite_id__` FOREIGN KEY (`satellite_id__`)
  REFERENCES `satellites` (`satellite_id`)
  ON DELETE CASCADE
);
```

```
INSERT INTO `satellites`.`satellite_update` (`satellite_id__`, `update`, `date-time`)
VALUES ('500', 'Satellite 6.7 Release', '2020-04-17');
INSERT INTO `satellites`.`satellite_update` (`satellite_id__`, `update`, `date-time`)
VALUES ('501', 'Satellite 6.5 GA Beta Release', '2019-05-23');
INSERT INTO `satellites`.`satellite_update` (`satellite_id__`, `update`, `date-time`)
VALUES ('502', 'Satellite 6.8 Update', '2020-10-30');
```

satellite_id__	update	date-time
500	Satellite 6.7 Release	2020-04-17
501	Satellite 6.5 GA Beta Release	2019-05-23
503	Satellite 6.8 Update	2020-10-30
504	Satellite 6.1.7 Update	2016-03-15
505	Satellite 6.1.9 Update	2016-05-17
506	Satellite 6.8 Beta Release	2020-08-18
507	Satellite 6.1.8 Update	2016-03-22
508	Satellite 6.0.7 Update	2015-01-16
509	Satellite 6.5.2 Update	2019-06-20
510	Satellite 6.3.3 Update	2018-08-22
511	Satellite 6.2.16 Update	2018-11-26
512	Satellite 6.1.12 Update	2017-06-29
513	Satellite 6.6.3 Update	2020-04-16

CHAPTER 4

RESULTS & CONCLUSION

In the previous chapter the reqirement analysis, overall design of project implementation and testing are discussed. The chapter deals with the result analysis, conclusion and future enchancement.

4.1 RESULTS

Our mission will facilitate users to get information about any missions of ISRO. If a user wants any information about any mission he can get it by our product only by mission name. our product will provide information about mission launching date, Orbit type, Application, mission was successful or not.

CHAPTER 5

REFERENCES

The links for the data read above respectively:

1. https://www.isro.gov.in/all-missions-0
2. https://www.isro.gov.in/spacecraft/list-of-earth-observation-satellites
3. https://www.n2yo.com
4. https://en.wikipedia.org/wiki/HATNet_Project

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