6.oProgram Structure

We developed **Rocket Launching system** which simulate the final stages of a Rocket Launch.

The complete structure of the programs is shown below:

NAMING CONVENTION

Objects	Naming Conventions
Header files	SpaceMission.h Rover.h HumanSpaceMission.h Satellite.h ControlUnit.h Model/Astronaut.h Astronaut.h
Classes	SpaceMission, Rover, HumanSpaceMission, Satellite, ControlUnit, Astronaut
Modules	SpaceMission, Rover, HumanSpaceMission, Satellite, ControlUnit, Model/Astronaut UML_diagram.html UML_diagram.jpg makefile
Functions	check_payload(); check_all_system_status(); iniatialising_launch_sequence(); mission_success(); HumanSpaceMission(); addAstraunautsToTheMission(); load_rover_in_rocket(); check_successful_loading(); Satellite(); load_the_satellite(); check_successful_loading() SpaceMission(); about(); getSpecialization(); get_mission_name(); simulate1(); simulate2(); simulate3(); setName(); setGender(); setAge(int); setSpecialization(); Astronaut(); printName(); getAge();

```
getName();
getGender();
glutInit(&argc, argv);
glutInitDisplayMode(GLUT_DOUBLE | GLUT_RGB);
glutInitWindowSize(600, 600);
glutCreateWindow("rocket");
myinit();
glutKeyboardFunc(keyboard);
glutDisplayFunc(display);
glutIdleFunc(display);
glutMainLoop();
```

Objects	Naming Conventions
Program variables	mission_name, purpose_of_mission, input, mission, c1, control, orbitalRadius, destination, weight_of_rover, astronaut, mission_name, destination, number_of_crew_members, c, degInRad, count1, flag, radius, u, v, l, count3, p, I, j, flag1, count, DEG2RAD, t, f, key, x, y.
Program file	Simulator.cpp

6.1Explanation of Important functions

```
setName(string): It is a void type of method taking name as parameter and
giving that value to name field of astronaut class.

setGender(Gender): It is a void type of method taking gender as parameter and giving
that value to gender Enum object field of astronaut class.

setAge(int): It is a void type of method taking age as parameter and
giving that value to age field of astronaut class.

printName(): It is a void type of method used for printing the name of astronaut.

getName(): It is a string type of method used to return the name of astronaut.

getAge(): It is a int type of method used to return the age of astronaut.

Astronaut(): It is the constructor of the astronaut class used to create the object
of class
```

setSpecialization(): It is a void type of method taking specialization as parameter and giving that value to specialization field of astronaut class.

simulate1(mission, c1): It is a function made in simulator file taking mission (pointer of spacemission class) and c1(pointer of control unit class) as parameter and then used to simulate the rover.

Simulate2(mission, c2): It is a function made in simulator file taking mission (pointer of spacemission class) and c1(pointer of control unit class) as parameter and then used to simulate the satellite.

Simulate3(mission, c3): It is a function made in simulator file taking mission (pointer of spacemission class) and c1(pointer of control unit class) as parameter and then used to simulate the Humanspacemission.

Check_payload():This is a function of the Control Unit class. This function is used to check the payload of the rocket if the payload is there in the rocket or not. If true it returns a message regarding that.

Check_all_system_status(): This function is used to check if all the systems are working properly or not. It mainly contains the following tests:
1.Thermal screening check
2.Fuel check
3.Communication System check
4.Electronics equipment test
5.And sensor check
6.Cryogenic engine check

Initialising_launch_sequence():After all the necessary checks this function initializes the launch process. And starts a countdown from 10 to 0.

Mission success(): This function starts only after the launch sequence and returns message if the mission is successful or not.

Human_Space_mission(): This is a class for all human space exploration related missions. It also contains a class for storing all the details of astronauts.
This class is used to store all human space mission related information and It also has certain functions to operate human space mission.

add_astronauts_to_the_mission():This is a function of human space mission class and is used to add astronauts to human space missions.

load_rover_in_rocket(): this is a function of rover class and used to load rover in rocket. It prints a message about loading rocket.

check_successful_loading(): It is used to perform loading checks means if rover loading is successful or not. If the loading is successful it prints a message for that.

Satellite(): Satellite is a class for all the satellite launching missions. This class is used to store all the information about satellite and about a specific mission and It has various functions to perform on that and all the necessary functionalities required to operate a satellite launch mission.

load _the_satellite(): This is a function of Satellite class. And during the mission it is used to load the satellite in the rocket.
It prints a message regarding satellite Loading.

check_successful_loading(): This is a function of Satellite class . And the main purpose of This function is to check if the loading is successful or not. If the loading is successful and it returns a message for that.

Space_Mission(): This is a main class to store all the basic information of missions like space mission name, destination etc. It has various functions to conduct and operate a mission successfully.

about(): This is a very important function of Space Mission class. It’s main use is to get all the necessary information about a specific mission for example what is the name of mission, what is the purpose of the mission etc.

get_specialisation(): It is a function of Astronaut class. All the necessary information about astronauts are stored in Astronaut class. This function returns the specialisation of a specific astronaut for example what is the main specialisation of astronaut during the mission.

get_mission_name(): This is a function of space mission class. It is a very basic function and it returns the name of a particular mission. It is used in various other function to obtain the name of that mission.