

[5# Plans of Skeleton]

[5] – [SoftProLab Team]

Supervisor:
Dr. Katalin Balla

Members:

Hagverdiyev Subhan	NHL9KN	subhan.hakverdiyev@gmail.com
Madatov Ali	XVEARA	ali.madatov@hotmail.com
Shoaib Areeba Tabassum	EZXFWK	areebashoaib99@gmail.com
Salahov Kamal	IG5LSM	salahovkamal@hotmail.com
Singh Gurdeep	ERXIPV	sandhugoldy433@gmail.com

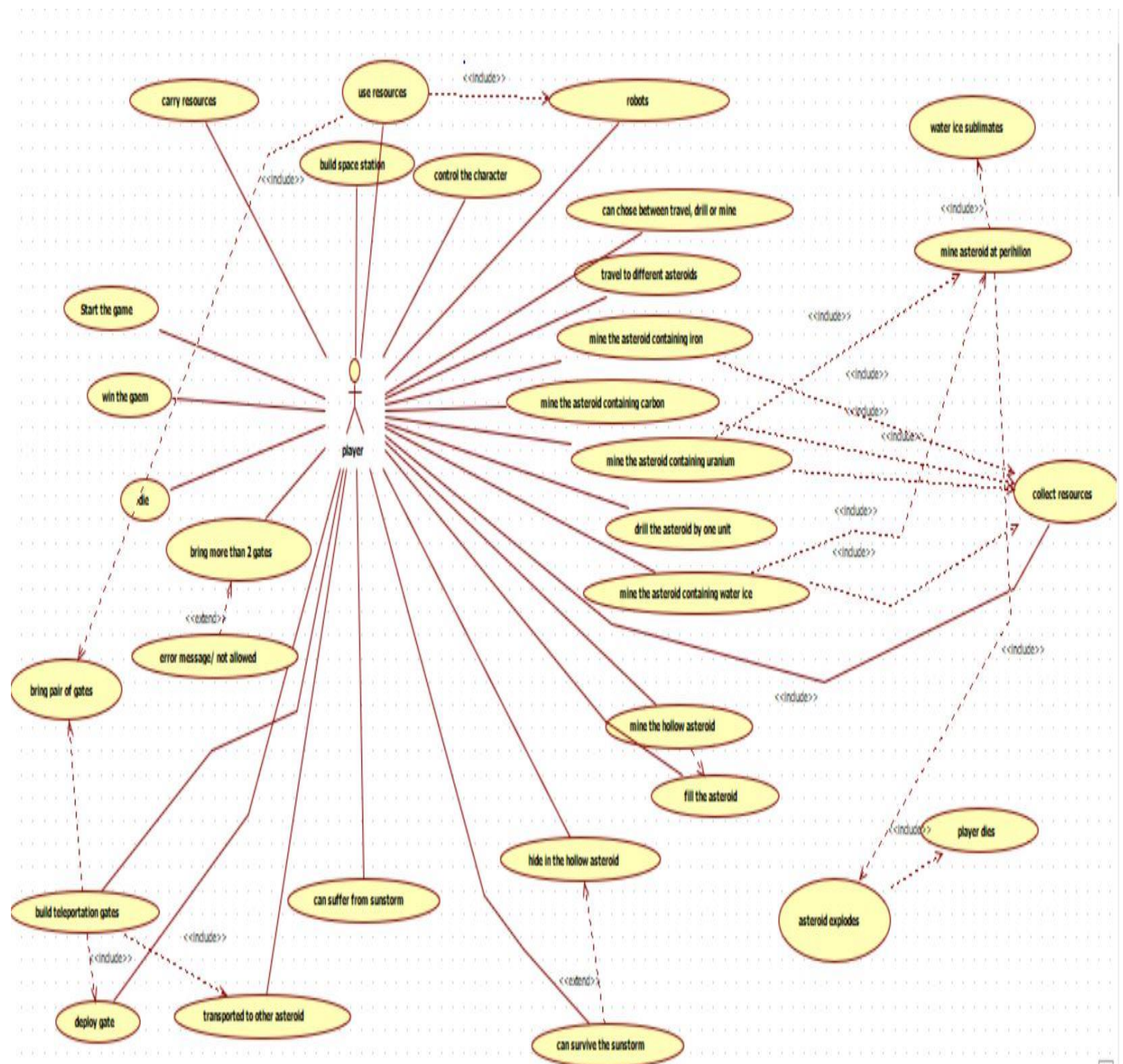
12.03.2021

5. Planning the skeleton

5.1 Real use-cases of the skeleton model

[The real use-cases related to the skeleton program, as a stand-alone one.]

5.1.1 Use-case diagram



5.1.2 Use-case descriptions

Use-case name	Build space station
Short textual description	The main task of the game is to build a space station in the asteroid belt in order to win the game
Actors	Player
Dialog, scenario	The player can win the game if it successfully builds the space station by collecting at least three units of each resource and they collect those materials on a single asteroid. All these things are happening inside the game field which is going to be generated by the computer through coding

Use-case name	Control the character
Short textual description	Player is going to be any normal/physical person who has a knowledge on how to use computer, mouse and keyboard.
Actors	player
Dialog, scenario	Player can be me, you or anyone who can play the game and know how to use the controllers.

Use-case name	Robots
Short textual description	In the game if the player has collected a particular amount of resources then it can build a robot
Actors	Player
Dialog, scenario	If the player has collected a unit of iron, carbon and uranium then the option to build the robot is going to appear. If the player accepts it then an autonomous robot is going to be present inside the game field. If the player accepts to build a robot then the amount of resources that he has collected would become less because he used the amount of those resources to build the robots. The player cannot control the robot. Robot is controlled through coding done by programmers. All the tasks of robot are defined inside the coding. Robot will behave like a helping hand for the player.

Use-case name	Can choose between travel, drill or mine
Short textual description	The player can perform 3 operations i.e Travel, Drill and Mine in the game.
Actors	player
Dialog, scenario	When the player is on the asteroid three options are going to appear on the game screen asking the player if it wants to travel, drill or mine. He can choose any option for eg if the player doesn't want to drill or mine then it can choose travel to continue travelling to other asteroids.

Use-case name	Travel to different asteroid
----------------------	------------------------------

Short textual description	Player can travel to different asteroids by choosing this option
Actors	Player
Dialog, scenario	When the player lands on one asteroid he can choose between travel, drill or mine. If he chooses to travel then it would mean that he doesn't want to drill or mine that asteroid so he has decided to travel to other asteroid.

Use-case name	Mine asteroid containing iron
Short textual description	Player can easily mine the asteroid by choosing this option
Actors	Player
Dialog, scenario	When the player lands on one asteroid, he can choose between travel, drill or mine. If he chooses to mine then he can collect the iron present inside the resources. If the asteroid hasn't been drilled through and still the player chooses the option to mine then a message is going to appear that the mantle hasn't been completely drilled through. The more the resources the player is going to collect, the resources counter for iron on the game screen is going to appear which will help to keep the player informed that how much more resource it needs to collect

Use-case name	Mine the asteroid containing carbon
Short textual description	Player can easily mine the asteroid by choosing this option
Actors	Player
Dialog, scenario	When the player lands on one asteroid, he can choose between travel, drill or mine. If he chooses to mine then he can collect the Carbon present inside the resources. If the asteroid hasn't been drilled through and still the player chooses the option to mine then a message is going to appear that the mantle hasn't been completely drilled through. The more the resources the player is going to collect, the resources counter for Carbon on the game screen is going to appear which will help to keep the player informed that how much more resource it needs to collect.

Use-case name	Mine the asteroid containing uranium
Short textual description	Player can easily mine the asteroid by choosing this option.
Actors	player
Dialog, scenario	When the player lands on one asteroid, he can choose between travel, drill or mine. If he chooses to mine then he can collect the Uranium present inside the resources. If the asteroid hasn't been drilled through and still the player chooses the option to mine then a message is going to appear that the mantle hasn't been completely drilled through. The more the resources the player is going to collect, the resources counter for Uranium on the game screen is going to appear which will help to keep the player informed that how much more resource it needs to collect. Uranium is a radioactive resource so the player needs to be careful in mining that asteroid.

Use-case name	Mine the asteroid containing water ice
Short textual description	Player can easily mine the asteroid by choosing this option
Actors	Player
Dialog, scenario	When the player lands on one asteroid, he can choose between travel, drill or mine. If he chooses to mine then he can collect the Water ice present inside the resources. If the asteroid hasn't been drilled through and still the

	player choses the option to mine then a message is going to appear that the mantle hasnt been completely drilled through. The more the resources the player is going to collect, the resources counter for Water ice on the game screen is going to appear which will help to keep the player informed that how much more resource it needs to collect. player needs to be careful in mining that asteroid containing water ice.
--	--

Use-case name	Drill asteroid by one unit
Short textual description	Player can easily drill the asteroid by choosing this option.
Actors	player
Dialog, scenario	When the player lands on one asteroid, he can chose between travel, drill or mine. If he choses to drill then a tool for drilling is going to appear in its hand through which he can drill the mantle. If the mantle has been drilled completely, the message is going to appear that the asteroid has been drilled completely.

Use-case name	Mine the hollow asteroid
Short textual description	The asteroid can mine the hollow asteroid. Hollow asteroid means that the asteroid is empty from inside i.e it doesnt contain any resources inside it.
Actors	Player
Dialog, scenario	The player doesnt know which resources are contained by which asteroid and which asteroid is hollow. This is going to be known by the player only when he has drilled the asteroid completely and wants to mine it. If the asteroid is empty, a message is going to appear that the asteroid is empty.

Use-case name	Fill the asteroid
Short textual description	Hollow asteroid can be filled with the resources carried by the player.
Actors	Player
Dialog, scenario	When the asteroid has been completely drilled through and a message appears on the screen that the asteroid is empty, along with that message, two options are going to appear on the screen, first option would be 'fill the asteroid' and second option would be 'hide in the asteroid'. If the player selects fill the asteroid then he can fill that asteroid with the resources that he has previously collected. This can be helpful for him because he can only carry 10 units of resources in the spaceship.

Use-case name	Hide in the hollow asteroid
Short textual description	Hollow asteroid can be used by the settler to hide in it in order to escape sunstorm.
Actors	Player
Dialog, scenario	When the asteroid has been completely drilled through and a message appears on the screen that the asteroid is empty, along with that message, two options are going to appear on the screen, first option would be 'fill the asteroid' and second option would be 'hide in the asteroid'. If the player selects hide in the asteroid then he can hide in the asteroid in order to survive the sunstorm. The player can survive the sunstorm only if it hides in the hollow asteroid.

Use-case name	Can survive the sunstorm
Short textual description	Sunstorm can occur at any given moment of time described in the coding by the programmer.
Actors	Player
Dialog, scenario	Sunstorm will be described in the coding scheme by the programmer to occur at any given moment of time. The settler can only survive the sunstorm if it hides in the hollow asteroid. If the settler doesn't hide in the hollow asteroid then it can get damaged by the sunstorm.

Use-case name	Can suffer from sunstorm
Short textual description	Sunstorm can occur at any given moment of time described in the coding by the programmer.
Actors	Player
Dialog, scenario	Sunstorm will be described in the coding scheme by the programmer to occur at any given moment of time. Settler won't know when or where the sunstorm will occur. If the settler doesn't hide in the hollow asteroid then it will experience damages from the sunstorm.

Use-case name	Build teleportation gate
Short textual description	If the settler has collected enough resources it can choose between the option to build gate and build teleportation gate.
Actors	Player
Dialog, scenario	When the player has collected enough resource then it can choose the option to build teleportation gates from those resources. The resources counter would decrease because the player has used those resources to build the gates. Through the gates the player or robot can travel to neighbouring asteroids. It depends on the settler if he lets the robot use the gate or use the gate himself.

Use-case name	Transported to other asteroid
Short textual description	The settler can use the gate to get transported to the other asteroid easily
Actors	Player
Dialog, scenario	By using the gate the settler or robot is going to get transported to the other asteroid. The gate's functionality is really useful for the settler as it can travel to different asteroid easily without consuming any more time.

Use-case name	Deploy gate
Short textual description	The robot can deploy gate on any asteroid he wants.
Actors	Player
Dialog, scenario	The robot can deploy gate on any asteroid he wants. The settler won't know that on which asteroid it's going to land through using gates. The settler is going to land on a random different asteroid.

Use-case name	Bring pair of gates
----------------------	---------------------

Short textual description	The settler can carry pair of gates with himself while exploring asteroid belt.
Actors	Player
Dialog, scenario	Its going to be defined in the programming that the settler can carry pair of gateswith himself. The settler can use those gates anytime and aywhere he wants

Use-case name	Bring more than 2 gates
Short textual description	The settler cannot bring more than 2 gates with itself
Actors	Player
Dialog, scenario	It is not allowed for the settler to bring more than 2 gateswith him. Settler can only bign 2 gates with him not more than 2.

Use-case name	Error message/not allowed
Short textual description	Error message for bringing 2 gates.
Actors	Player
Dialog, scenario	If the settler choses to bring more than 2 gates then a message is going to be shown on the screen that its not allowed to bring more than 2 gates.

Use-case name	Win the game
Short textual description	The player can win the game if all th condiditons for winning the game has been met.
Actors	Player
Dialog, scenario	The player can win the game , if they can mine at least three unit of each resource and they collect those materials on a single asteroid, they can build the space station and the players win the game. Game won message is going to appear on the screen

Use-case name	Start the game
Short textual description	The player can start playing the game whenevrhe wants
Actors	Player
Dialog, scenario	The options or going to appear which is going to ask the player if he wants to play? If the player select to play then he is going to be taken to the game field.

Use-case name	Carry resources
Short textual description	The settler can carry resource with himself.
Actors	Player
Dialog, scenario	The settler can carry only 10 units of resources, that's the spaceships' capacity. The setteler wont be allowed to carry more than 10 units. If the settler. Message is goint to appera showing not allowed to carry more than 10 units.

Use-case name	Use resources
Short textual description	The settler can use the resource on whatever thing he wants
Actors	Player
Dialog, scenario	If the settler wants to save the resources then he can save them. If he wants to use the resources on robots then he can use it or if he want to use the resources on teleportations then he can use the resource on those as well. The condition is that the settler must have enough resurces to use them on these things

Use-case name	Mine asteroid at perihilion
Short textual description	Its dangerous to mine the asteroid at perihilion because it can either explodes or waterice sublimates or nothing happened
Actors	Player
Dialog, scenario	The settler doesnt know which resources does the asteroid contain. If the resource inside the asteroid at preihilion is Uranium and the settler starts drilling and mining it then the asteroid is going to explode and the settler is going to die. So, its better not to mine any asteroid at perihilion

Use-case name	Water ice sublimates
Short textual description	If the asteroid is drilled and is at perihilion the water ice is going to dissappear.
Actors	Player
Dialog, scenario	When a fully drilled asteroid with water ice in its core is at perihelion, the water ice sublimates, In this way the settler wont be able to collect any resources from that asteroid.

Use-case name	Asteroid explodes
Short textual description	The asteroid at periohilion is going to explode
Actors	Player
Dialog, scenario	The asteroid at perihilion is going to exploe if it has uraium inside it as a radioactive reosurce.

Use-case name	Player dies
Short textual description	The player can die in certain conditons
Actors	player
Dialog, scenario	The player can die if he has been standing on the radioactive asteroid and the asteroid explodes or it can also suffer damage if he doesnt hide during the sunstorm.

Use-case name	Collect Resources
Short textual description	When the settler has completelty drilled the asteroid, he can mine it an after mining he can collect the resources
Actors	player
Dialog, scenario	The settler can collect whichever resources are present in the asteroid. However, this is possible only if the asteroid has been drlled through. As the settler collect the respurces, the resources counter is going to increase for whether the resource is carbon, iron etc.

5.2 Plans of the skeleton's UI, dialogs

All these buttons must be present in graphic interface, along with the graphic implementations for all the furthermentioned objects:

5.2.1 Start Game

Game starts to initialize once User clicks on „Start game” button on Main Menu. Game, asteroid, settler objects get instantiated. First settler gets accepted to its initial asteroid. Asteroids get to know neighboring asteroid. After these tasks are finished graphical implementation of game is presented to the User.

5.2.2 Move Settler

When User clicks on „Move settler” action of settler, the asteroid that settler belongs to must present the User message containing the list of neighboring asteroids or paired teleportation gates. Then, User must input/select destined asteroid/gate from that list. After input by user, initial asteroid removes that settler from list of objects on it and destination asteroid accepts settler and adds to its list of objects on surface. Also, if destination asteroid has hidden unit of mineral and settler which moved to that asteroid has 1 units of free space in its inventory, that mineral is automatically added to inventory of settler. When used on teleportation gates, everything remains the same, except that target destination becomes asteroid linked with pair of the gate settler is traveling to.

5.2.3 Drill Asteroid

If depth of mantle of asteroid is more than 0, User can click/select „Drill Asteroid” action of settler that is on that asteroid. Remaining depth must be visible to the user through graphical interface even before selecting „Drill Asteroid”. After selection, settler must drill mantle by 1 unit and message containing remaining depth must be returned to the user.

5.2.4 Mine Asteroid

If depth of mantle equals to zero, meaning that mantle has been drilled through and if Asteroid is not Hollow Asteroid, „Mine Asteroid” action of settler becomes available to the user. User receives message notifying him if asteroid is in perihelion state. Also, core of the asteroid is viewable by User using graphic interface. When selected by User, settler mines the core of the asteroid transforming it to hollow asteroid and then takes that mineral in the core to the inventory, excluding some cases. Those cases are:

5.2.4.1

If User have 10 units in inventory, then message must be presented to User saying that there's no space in settler's inventory.

5.2.4.2

If asteroid is in perihelion state and the mineral at core of the asteroid is uranium, when User selects „Mine Asteroid” action uranium blows up Asteroid, destroying Settler, Asteroid and all objects on it, except the robots which get transfered to one of the neighboring asteroids. User receives message about destroyed objects.

5.2.4.3

If asteroid is in perihelion state and the mineral at core of the asteroid is water ice, when User selects „Mine Asteroid” action, water ice vaporizes and vanishes from game. User receives a message about destruction of mineral.

5.2.5 Hide Settler

If the core of a asteroid is hollow, then User can select „Hide Settler” action of settler on that asteroid. User can see change through graphical interface. When there is a sun storm, hidden units are not affected by it. User receives message when sun storm is over. Only available action while in hiding is „Move Settler”.

5.2.6 Hide Mineral

If the core of an asteroid is hollow and there's at least 1 unit of mineral in settler's inventory that is on that asteroid, then User can select „Hide Mineral” action of settler. When selected, game presents User the list of inventory through graphical interface and when User selects one unit of mineral, that mineral is transferred to the core of the asteroid, making it non-hollow asteroid. Next time a settler with a free space in inventory lands on that asteroid, that mineral is automatically transferred to that settler. Only one unit of mineral can be hidden in the core.

5.2.7 Build Robot

If settler has at least one unit of iron, carbon and uranium „Build Robot” action becomes available. When selected by User, single unit of each previously mentioned minerals get removed from inventory of settler, robot object is instantiated and placed on the asteroid which settler is on. User receives message about previous changes and built robot is created and added to asteroid on graphic interface too.

5.2.8 Build Teleportation Gates

If settler has at least two units of iron, one unit of water ice and uranium „Built Teleportation Gates” action becomes available. When selected by User, two units of iron and single units of water ice and uranium get removed from inventory of settler, pair of teleportation gates objects are instantiated and added to inventory of settler. A pair of teleportation takes one unit of inventory space and if one of them have been deployed other one still consumes one unit. User receives message about removed minerals and created pair of teleportation gates. A pair of teleportation gates can be hidden in the core of hollow asteroid the same way as minerals.

5.2.9 Deploy Teleportation Gate

If settler has a pair of teleportation gate or second gate of pair, then „Deploy Teleportation Gate” action is available. When selected by User, gate object is added to the neighboring asteroids list of the asteroid that settler is on. This change is viewable through graphic interface too. If deployed gate is second gate of pair, then first gate of pair is also added to neighboring asteroids list of second pair and vice versa.

5.2.10 Death

If settler dies for some reason, then settler object is destroyed and removed from graphic interface along with its inventory. User also receives message about the casualty.

5.2.11 Finish Round

After User has used all possible actions this turn, round automatically is finished. User receives all the information about the result/changes during last round, also graphic interface is adapted to the changes of last round.

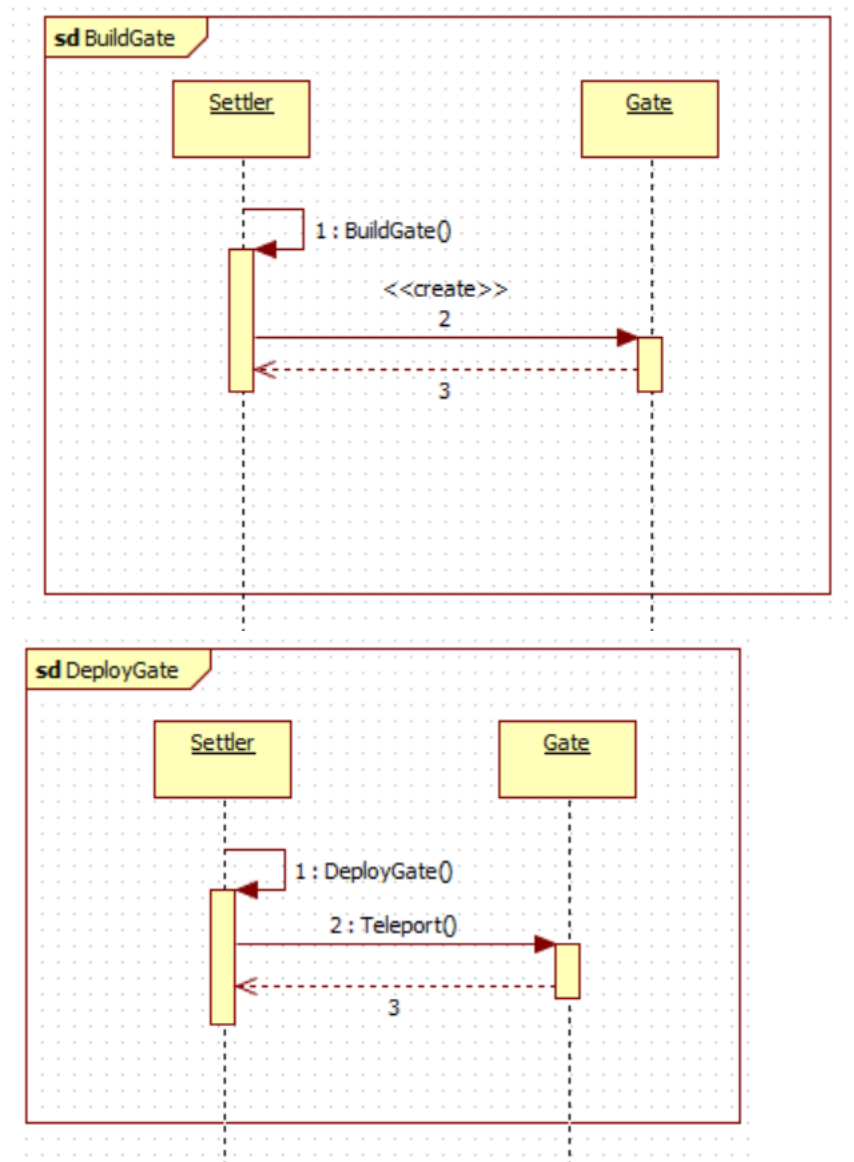
5.2.12 Game Lost

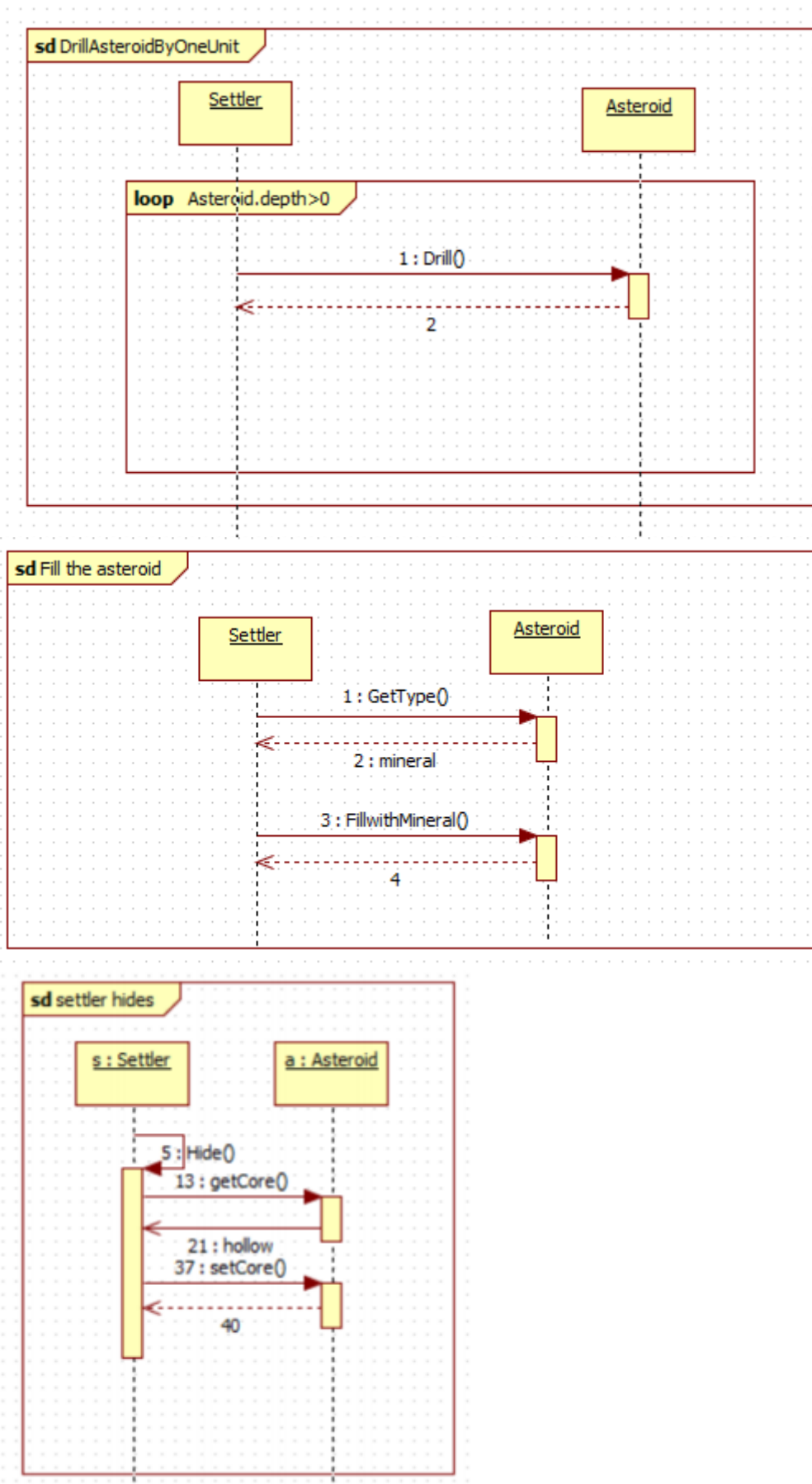
If all settlers are dead, then User loses game and is automatically redirected to Game Lost interface. After that User is redirected to Main menu.

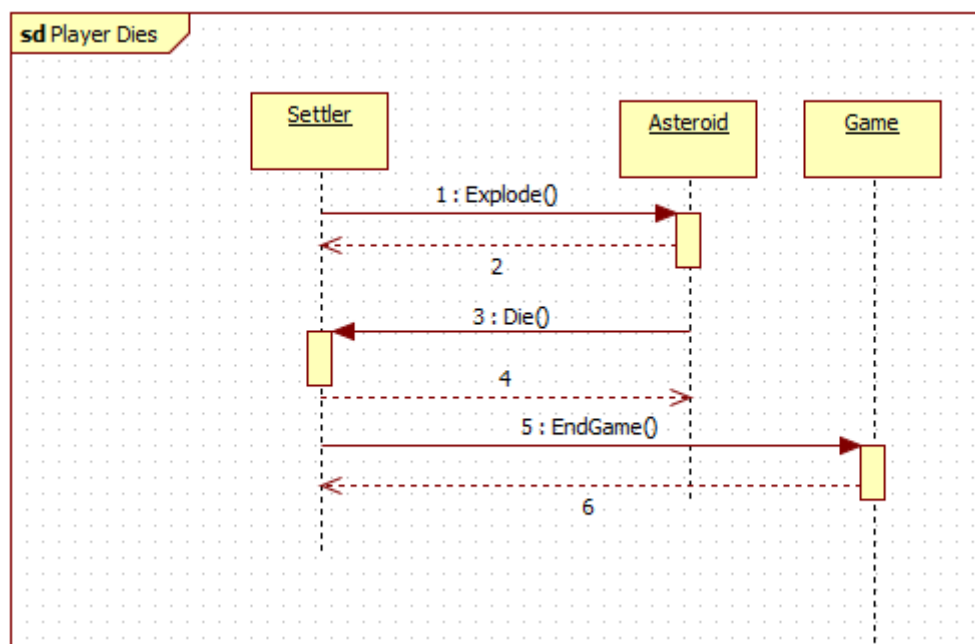
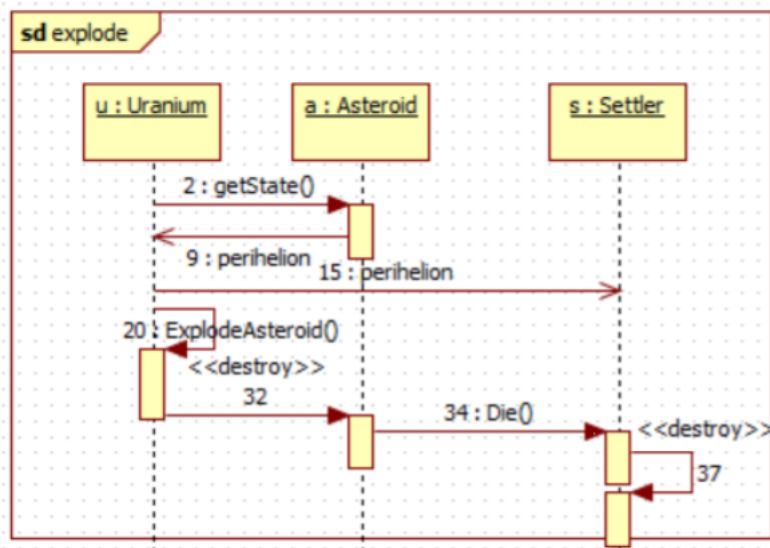
5.2.13 Build Station/ Game Won

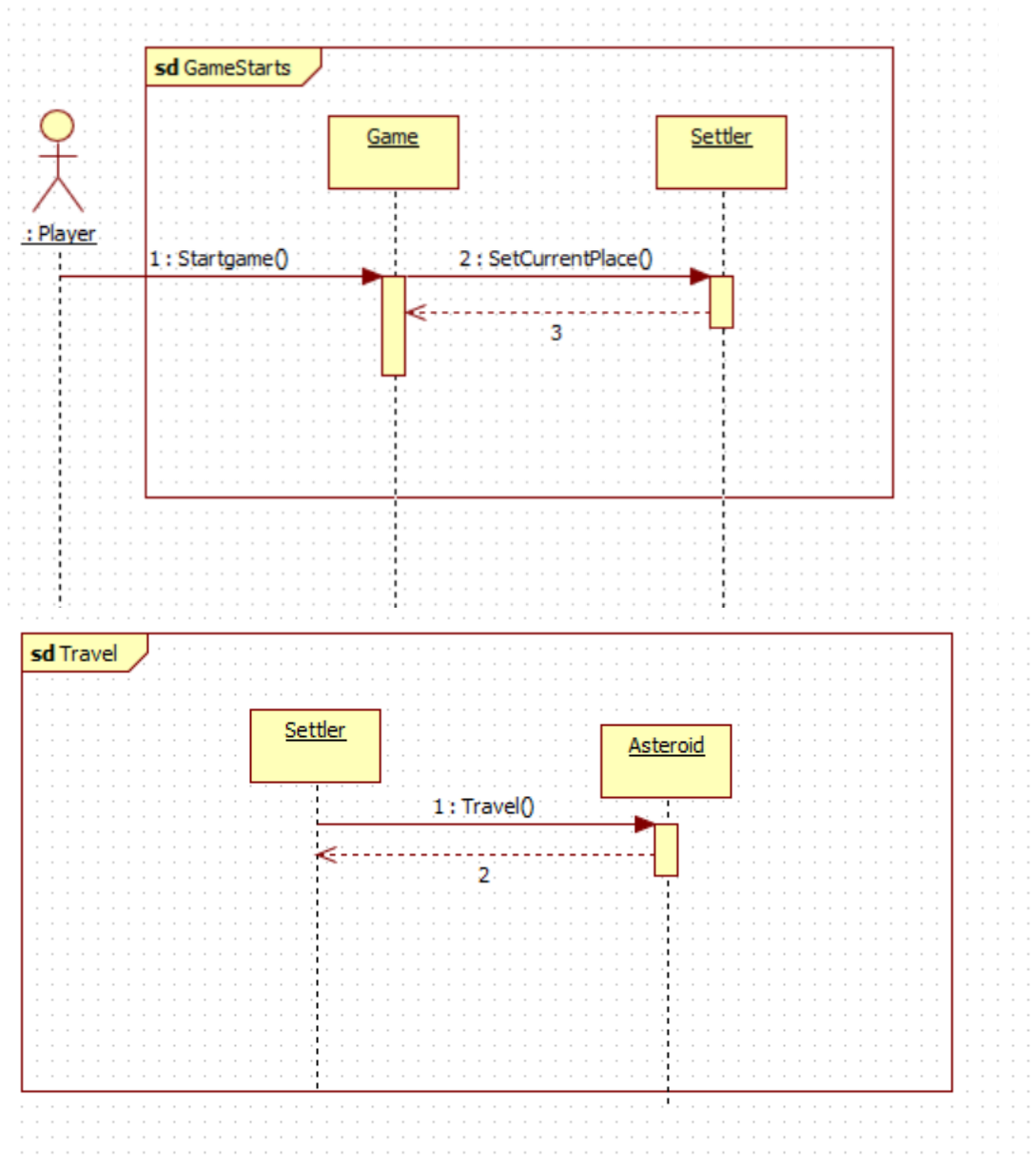
If settlers on the same asteroid have at least one unit from each mineral, then „Build Station” action becomes available to User. When selected settler builds Space Station which is added to graphic interface and if settlers survive that round then User wins the game and is automatically redirected Game Won interface. After that User is redirected to Main menu.

5.3 Detailed sequence diagrams for internal activities



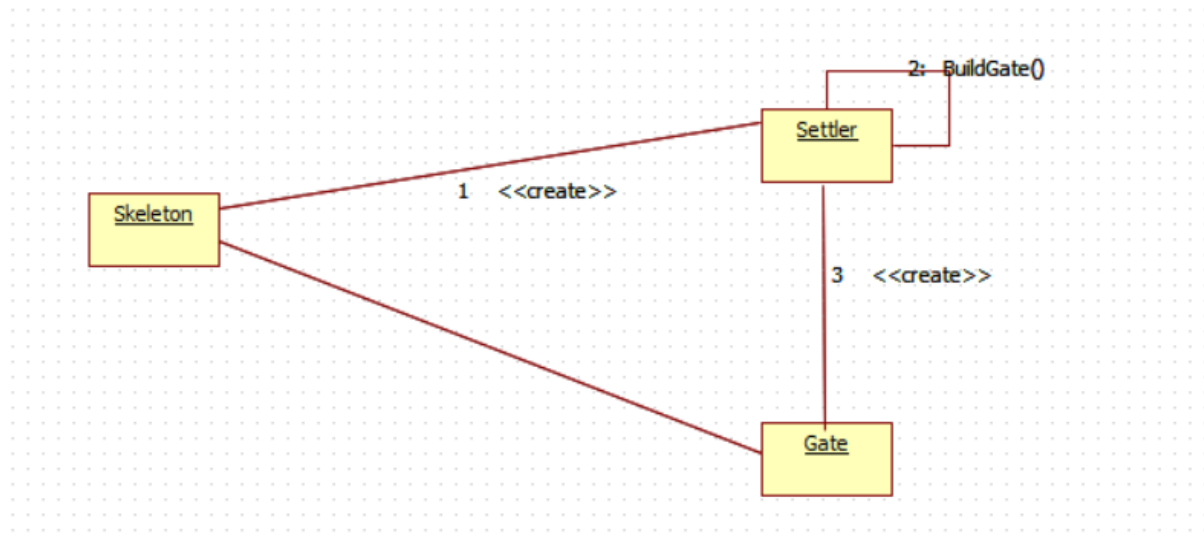




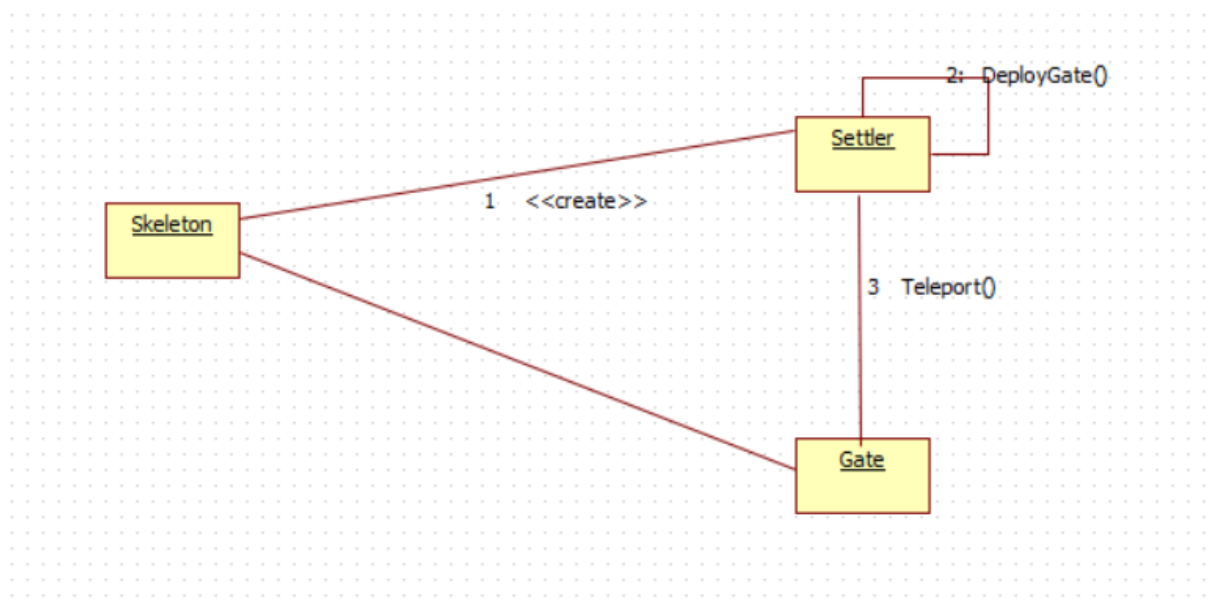


5.4 Communication diagrams

Settler BuildGate



SettlerDeployGate



Protocol

Start (date & time)	Duration (hours)	Performer(s) name	Activity description
12.03.2021	40 minutes	Salahov Kamal, Hakverdiyev Subhan, Madatov Ali, Shoaib Areeba Tabassum, Singh Gurdeep	Meeting, discussing and dividing tasks.
14.03.2021	5 hours	Salahov Kamal	5.2
14.03.2021	5 hours	Areeba T. Shoaib	5.1
21.03.2021	45 minutes	Gurdeep	5.4
21.03.2021	45 minutes	Hagverdiyev Subhan, Madatov Ali	5.3 SequenceDiagram