Matthew Castillo
CS162 400, Spring 2017
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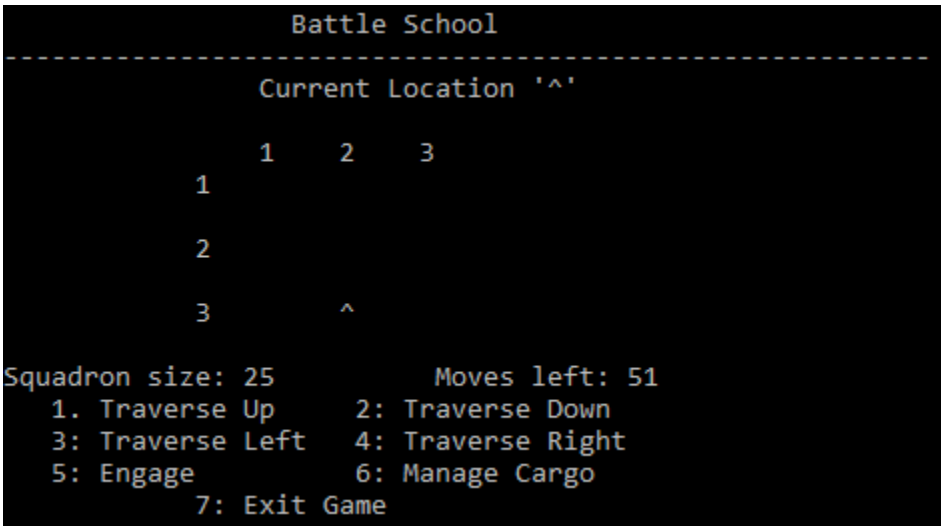
Final Project

The rules are:

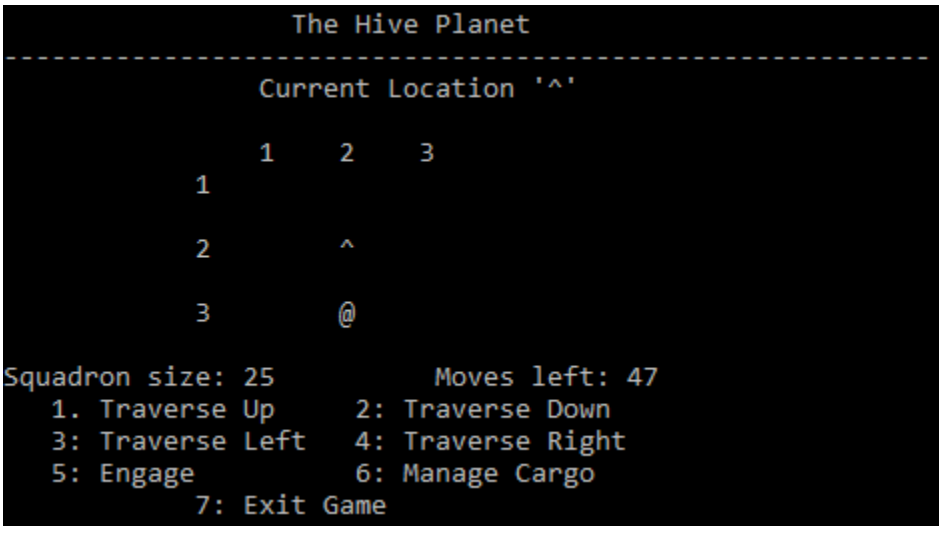
The user will have to interact with the various spaces in the game to locate the needed items to enter the final location 'The hive planet.' The user will learn of the mission by entering the 'Battle School' space where they will be told what they will encounter and how to navigate through the areas. Only after the user completes the task will they be able to travel around the map. Additionally, The user will be instructed on their goal to complete the mission.

The user will be traversing through a 'simulation' with 9 different areas to enter.

The icons to these areas will not be displayed until after the player completes the task within the Space.



After a space has been interacted with then that area will have a specific icon presented for that area



The user is freely able to travel up and down, when they choose to go 'off' the grid they will end up on the other side of the map. I wanted it to be representative of the 'universe' where you may move anywhere in space.

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During my planning, I wanted to ensure that I would attempt to use various techniques learned throughout the course and implement it into my program. I also wanted to utilize the concept of the fantasy game that we created during the class. So there are 3 'bug' planets that have a similar concept in that the user will fight against a bug planet with different attack and defense pts. The user will then encounter different tasks as they traverse through the map and select to 'Engage' with the planet. When entering the world, they will be instructed on what they need to do to complete the task. They must complete the interaction or not lose their life to have successfully interacted with the Space.

The user begins with 25 health and 51 moves to complete the game.

Interactions

- User will first interact with the 'Training grounds' as mentioned – Training Grounds Space
- As mentioned user, will engage with a bug planet where they will utilize their attack and defense points to fight. – Bug installation Space
- User will need to complete 3 riddles in the 'Saving commander' location – Mazer Space
- User will need to be persistent in the 'Forgotten castle' to complete it, User must engage with it 3 times before completing it. – Giant Space
- In 'Defy Physics' the user will traverse down a black hole but will be given several opportunities to leave, however, the user must continue to complete task. – Black Hole Space
- In 'Little Device' the user will need to send a message to complete the task. – Doctor Space
- Then lastly the user will be able to enter the 'Hive planet' once they collect the egg and the little device. – Hive Planet Space
- Units include a cadet (user's character) and a bugger (computer's character). The cadet will be able to store items picked up at different locations. Both will have attack and defense abilities like that of the fantasy game with the roll of a die. The Cadet will be able to use some of their inventory to reduce damage, prevent damage, or increase attack power.

Problem to be solved:

- Each space will be a class with at least **four pointer variables** (or arrays of pointers) that link to other spaces (Right, Left, Top, Bottom, etc.).
- You must have **at least 6 spaces of at least 3 different types**. You will have a space **abstract class** that will have special pure virtual functions.
- So, you will have at least **3 derived classes** for your spaces.
- You should have **a time limit** to urge the player on as well.
- The player must **interact with parts of the space structure**, and not just simply collecting things.
- The player will have a **container** (backpack, knitting bag, or notebook) to carry "items". The container must have some limit (weight, size, etc.). One or more of these **items will be required as part of the solution**, such as a "key" to open the locked door.

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FILES

HPP	CPP
 Mazer.hpp	 Mazer.cpp
 HivePlanet.hpp	 HivePlanet.cpp
 Giant.hpp	 Giant.cpp
 Game.hpp	 Game.cpp
 Doctor.hpp	 Doctor.cpp
 Cadet.hpp	 Cadet.cpp
 Buggers.hpp	 Buggers.cpp
 buggerInstallation.hpp	 buggerInstallation.cpp
 BlackHole.hpp	 BlackHole.cpp
 Validate.hpp	 Validate.cpp
 Unit.hpp	 Unit.cpp
 trainingGrounds.hpp	 trainingGrounds.cpp
 Space.hpp	 Space.cpp
 Simulation.hpp	 Simulation.cpp
 Menu.hpp	 Menu.cpp
	 main.cpp

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Main.cpp:

- Display menu to the user so that they may select an option
  - run regular program
  - Inquire if user would like to play again
- Run regular program:
  - Initialize new game and begin
  - Will repeat until user chooses not to play again
- Quit program:
  - User presses enter to exit.

Space Class

- protected:
  - Space classes to link top, bottom, left and right
  - The description of the space
  - The name of the space
  - Bool if interacted with space
  - Whether an item is essential
  - Unit for the player to enter the space
  - Vector so that the space may hold an object
  - Vector for the object that was removed by the user
  - Level of the space
  - Bool if mission is complete
- public:
  - Default Constructor

  Pure virtual functions
  - Destructor
  - Return description of space
  - Interaction of the area
  - If area was interacted with
  - And obtain item of that Space

  Mutator Functions
  - Set the item of the Space
  - Set the description of the space
  - Set if interacted
  - Set the level of the location
  - Set mission;

  Accessor Functions
  - Get the different location ‘directions’ so that the current location may point to it.
  - Get the name of the space
  - Return if the area was interacted with.
  - Return the current level of the Space

  Other Tasks
  - Remove item from space
  - Return if mission was complete
  - Print a blank space
  - Pause interaction
  - Link each space as well as name the location

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The various Space classes have similar functions

As mentioned early in the interaction section, the class will complete the specific action so that the player may obtain the item at the location

However, The Mazer class has a riddle Structure that contains the answers to the 3 different riddles asked in the class

The bugger installation has a private 'Bugger' unit that will fight against the user

The Doctor class contains a message that will changed to true to complete. Additionally, the user will be required to have 1 item to enter the area.

The Giant class contains attempts where a user must enter the class 3 times before they complete the task.

The Hive planet requires that the user has 2 items to enter

Unit Class

Public:

Int Squadron // Life of the unit
Int attack
Int defense
string name
bool itemTaken // If the item was taken

Public:

Constructor
Destructor pure virtual function

Check and manage 'inventory'
Virtual ManageCargo
Virtual setCargo
Virtual removeCargo
Virtual viewCargo
Virtual checkCargo
Virtual damage
Virtual addSquadron

Virtual rollDie for attack and defense points
setName
getName
getHealth
getAttack
getDefense
SetItemToTaken
removeSquadron
clearScreen

The Cadet will utilize the inventory management functions so that the cadet may pick up an item and store it if they have space in their inventory, additionally, the remove function will check to see if the item can be removed if it is not an essential item to the game.

Validation:

Validation function will return true or false so that the member can continue with the program

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TESTING FOR EACH SPACE and for each of the selections

Begin Game

User must press 5 'Interact' to begin the game, or 7 to exit.
If user chooses any other option he will be asked to enter a valid choice
Begin game with 25 lives and 50 moves.

Training Camp Space

** Note – term 'squadron' and 'fighters' are used interchangeably, represent user's life **
1. Item given '`Freeze Gun`'
2. User will be introduced to the game and will be given an item
3. User must press 6 to view what was placed in his cargo
4. If user chooses any other option he will be asked to enter a valid choice
5. User will be shown 'Freeze Gun' which adds 25% to his attack damage
6. Will be challenged to a dual
7. Display outcome … user has been given additional life when needed so he will always win
8. The number of rounds will be shown
9. The number of remaining squadron will be shown
10. After the battle, the user's squadron life will be replenished.

User will be shown directions of the game

User may traverse up, down, left, and right
Will be shown squadron size and how many moves they have left in the game
Will be shown current location
When unit interacts with a location and wins the task, then an icon will display in the map.

--- Take Item---

This section will be relevant for several of the spaces due to them providing an item once the mission/task was completed within the space. I will input 'Take Item' when this function is called in the other Spaces

User will be informed that there is an item to grab and will be shown the item
If there is one at the location
1. Yes 2. No

If 'YES' to viewing the item

They are shown what item is there and if they want to take it
1. Yes 2. No
If 'YES' to taking the item
User will be informed that the item was placed in their cargo and the item will be removed from the locations stack.

If they have 4 items in their cargo they will be asked to remove an item which cannot be "Dr. Device", "Queen Egg (To rebuild what was destroyed)", "Commander Mazer Rackham"
Else if choose not to remove item then they will not be given the item.
If 'NO' to taking the item, they will be informed that they can come back later

If 'NO' to viewing the item
Will be sent the message 'Hopefully it wasn't needed'

If traverse back to the location after winning the battle
User will be informed that there is an item to grab and will be shown the item
If there is one at the location
2. Yes 2. No

If 'YES' to viewing the item
They are shown what item is there and if they want to take it
2. Yes 2. No
If 'YES' to taking the item
User will be informed that the item was placed in their cargo and the item will be removed from the locations stack.
If they have 4 items in their cargo they will be asked to remove an item which cannot be "Dr. Device", "Queen Egg (To rebuild what was destroyed)", "Commander Mazer Rackham"
Else if choose not to remove item then they will not be given the item.
If 'NO' to taking the item
If 'NO' to viewing the item
Will be shown a quote about the area

Bugger Installation Space

3 different bugger locations will be available
Items to be taken:
1 with additional squadron (5 additional forces)
1 with a worthless item (poop)
1 with a defensive weapon (ansible device adds 2 to defense)

Player will be shown that he will battle a bugger installation

-- If the user wins then they will be shown how many rounds were played
The number of remaining squadron will also be shown

(Take Item)

-- If the user loses all their squadron

Then they will be told that they lost the battle
They will be sent back to the main area.

If user has an additional life
They will be given 10 additional units
Else
They will be told that they lost the game

Mazer Space

Item to be taken: 'Commander Mazer Rackham'
Player will be given 3 riddles
If player get a riddle right, then they will be given an additional squadron
If they get it wrong then they will lose 2 of the fighters.
If correct response, they will be informed they got it right and were given 1 additional fighter
If wrong response, shown correct response and that they lost 2 fighters
User will only win the game if they get 2 correct else they will not complete the task and will need to re-enter the Space.

(Take Item)

User must collect 'Commander Mazer Rackham' to be able to enter 'Little Device' area

Giant Space

Item to be taken: 'Queen Egg (To rebuild what was destroyed)'
The user will have to choose the correct cup to complete the task
Player will be presented with 2 options
'Left Cup' or 'Right Cup'
The user will lose 1 fighter for each wrong answer
A description of how their character dies will be shown

The user will have to 'INTERACT' with this Space 3 times before learning that the Giant is 'cheating' and then the user will be given a 3rd option
'Jump at the Giant's face!!'

If chooses to jump at the giant's face then the user will be informed that they killed the giant and that they received 3 of the fighters back.

(Take Item)

User must collect 'Queen Egg (To rebuild what was destroyed)' to be able to enter 'The Hive Planet' area

If user decides not to jump at the giant's face then they will be told that their character died but they will not lose addition fighters.

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Black Hole Space

Item to be taken: 'Warp Speed (Improves defense)'
The user is shown that they will need to traverse through a black hole to get to the center of the blackhole

They are given 2 options to turn back but if they choose to turn back then the user will not have interacted with the area

If they choose to keep going then, user will be informed that they hit some problems
Will be given 2 options, either to 'Attempt to steer away' or 'Use ships as shield to reduce damage'

Either selection will cause the user to receive some damage. If 'Attempt to steer away' was selected then 8 attack pts will calculated towards user's squadron
If 'Use ships as shield to reduce damage' then 5 attack pts will be calculated towards user's squadron

They will be informed about how many of their squadron were lost.

(Take Item)

User may collect 'Warp Speed (Improves defense)'

Doctor Space

Item to be taken: 'Dr. Device'
For the user to enter they must have 'Commander Mazer Rackham'

User will be informed about what has been going on at the facility.
User will be asked if they would like to send their family a message.
'YES' or 'NO'
If yes then

(Take Item)

If no then when you go back you must state that you would like to send the message
User must collect 'Dr. Device' to be able to enter 'The Hive Planet' area

Hive Planet Space

For the user to enter they must have 'Dr. Device' and 'Queen Egg (To rebuild what was destroyed)'

If the user has both items then they are presented with the battle description
User was told what the egg was used for and they are informed that they won the game

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Final Reflection

Overall, I really enjoyed this project. I did spend some thinking about the theme and wanted to stick with it. I just recently read the series for 'Ender's Game' and thought that it would be fun to incorporate it into a game.

With the enthusiasm going in, it really helped me to want to also incorporate some of the material we learned throughout the class. I think the most difficult aspect of the project was ensuring that I first got the requirements completed before adding other material. I had to learn to prioritize my time even though there were different types of 'mini-games' I wanted to incorporate into each of my spaces.

With that being said, I felt that I understood the idea of having each location linked with one another especially from the practice we had with links and queues. I did, however, had to review my pointers so that I understood how my character will be implemented in each area as they traversed through the different locations. Once I understood that I could pass the unit through the Space so that they are interacting in the location, it became simpler to understand and develop the rest of the gameplay.

Once that was understood, I then had to ensure that each of my steps in each of the locations were valid and that they responded correctly to the actions of the user. This did take some time and debugging as I had to work with the Unit class and the Space class so that they may work with one another and that they both receive the necessary information from one another to work correctly. For example, when implementing the getItem function in the Space class I had to ensure that the player would indeed take the item since they were only allowed to have 4 in their inventory. So, I had to ensure that the location knew that either the item was taken or not to release it from its own stack. I realized this once I learned that a user could continuously go back and grab and item without a limit. I found several little issues like this while completing the game. However, With the use of my testing sheet and checking off that each user selection was correct I could ensure that the game ran as intended.

Lastly, this is regarding what I wanted to implement if I had the time. I wanted the user to be able to save the game that they were currently playing, then have the option to play a new game. They then would have been able to save that game which would give them 2 games total saved. Then the user would be able to choose whether they would like to play the 1st or 2nd game… or if they would want to delete either one and start a new game. It was difficult to implement as I attempted to utilize a vector that took pointers to the game. Then I realized that I was having difficulty with ensuring that the game was within scope and that the memory was de-allocated properly. But unfortunately, I was unable to complete the task. However, this gave me the inspiration to keep learning and wanting to explore the different tools available to us as programmers as there are infinite ways of solving a problem.

I did enjoy the project and it was great to have been able to implement the various techniques that we learned throughout the class. It also taught me, like the other projects, that it is important to plan ahead and ensure that I prioritize what needs to be accomplished first before adding additional material.