1310 PROGRAM 2 – Linked List / Search / Sort

Creature Fight Game

FILES TO BE INCLUDED IN YOUR SUBMISSION

- **LinkedList.h** – header file containing your LinkedList class. You can put the entire class & function definitions in this one file if you want. In fact, if you do the extra credit and make it in a Template class, I highly recommend keeping it all in this one file.
- **Creature.h** – Creature class specification file – you may also define your Creature member functions here or separate them out in an implementation file like I did
- **[optional] Creature.cpp** – Creature class implementation file
- **CreatureFight.cpp** – contains the main function and any additional functions you created to make the program run
- **Makefile** (provided for you) – if you name your files differently or have more files, then you will need to modify the makefile.
- **creatureFile.txt** (provided for you) – feel free to add to the file your own creatures

DESCRIPTION

You are creating a game where players can pick their creature and then the creatures fight each other.

Each creature has a **life** point value and a **hit** point value.

On a player's turn, they roll one six-sided die and that die value is multiplied by the creature's hit points. That is the amount of damage that is done to the other player's creature's life points.

SPECIFICATIONS

The program should be created in a source file named **CreatureFight.cpp**. Below is the logic of the main function.

You may separate the logic in the main function into as many other programmer-defined functions as you want and name them whatever you want.

However, your program must work as specified below:

1. Create a linked list of **Creatures** (**Creatures.h** & **Creatures.cpp**). Use the **LinkedList** class (**LinkedList.h**) to accomplish this.

2. Enter all the magical creature data from file named **creatureFile.txt**. **Do not rename this text file** and **do not make the user enter in the filename** – just open creatureFile.txt and read in the data. Using the data in this file.
    a. After reading in the information about one creature from the file, do a **Binary Search (RECURSIVE VERSION)** on the name of the creature to see if a creature with this same name already exists. If it does, then print that this creature (print the name) was skipped because it is already in the creature list.

    b. If the creature does not already exist in the list, then
        i. create a new **Creature** object,
        ii. append the creature to the **LinkedList** object,
        iii. write and use the **MergeSort algorithm** to sort the nodes (**Creatures**) in the **LinkedList** object by **Creature name**.
        iv. print the name of the creature and tell the user that the creature has been added to the list.

    c. After repeating this for all the creatures in the text file, print a message to the user telling them how many creatures were added to the list from creatureFile.txt.

3. Now allow the users to play the game. Allow **two** players to enter in their name and then use their names throughout the rest of the output.

4. Ask the users if they want to print out the detailed information about each creature before having to choose which one they will use. Make sure to validate the user's output for data type and correct possible values.

5. If the users answer yes, then print out all details about ALL creatures.

6. Now allow player one to enter the creature number of the creature they wish to choose. Print out the creature's names like the example below in four columns and each creature should have a number beside it so the user can pick the creature with the number instead of having to type in the name.

```
GrapeApe, ENTER THE CREATURE NUMBER YOU WISH TO USE TO FIGHT!!
*******************************************************************************

 1-Banshee          2-Beholder         3-Mike Wazowski    4-Sasquatch
 5-Troll            6-Unicorn
*******************************************************************************
```

7. Then allow player two to pick a creature. They can pick the same creature if they want.

8. Now the players are ready to play. There should be **three** rounds, unless one of the creatures has <= 0 life points left.

9. For each round, give each player one turn, starting with player 1. Below is what should happen for each player on their turn

    a. Tell the player to hit enter to roll the die.

    b. Generate a random number between 1 & 6

    c. Multiply that random number by the player's HIT points.

    d. Subtract that amount from the opposing player's creature's LIFE points.

    e. If the opposing player's creature's LIFE points are now <= 0, then this player won the game (tell them)

10. If the game progresses through all three rounds, then after the third round is over see which creature has the most life points and then announce that player (and creature) as the winner.

11. Ask the user if they want to play again. If so, then you should start over with asking the player's for their names.

CREATURE CLASS

ATTRIBUTES

- Creature's name (string)
- Creature's description (string)
- Two integers – one for life points and one for hit points

MEMBER FUNCTIONS

- Constructor – initialize all attributes to values sent to constructor
- Accessor & mutator functions for all attributes
- Print creature – a function to print the details of a creature out to the screen in a nice, readable way

LINKED LIST CLASS

EXTRA CREDIT OPPORTUNITY:

Create the **LinkedList** class as a **template class** for 5 extra credit points!!!

PRIVATE MEMEBERS

- Create a structure called ListNode, which should hold a Creature and a pointer to the next ListNode
- ListNode pointer called head – will eventually point to the first node in the linked list
- ListNode pointer called tail – will eventually point to the last node in the linked list
- Integer called numNodes – will hold the number of nodes in the linked list

PUBLIC MEMBERS

- **Constructor** – initialize head, tail, & numNodes
- **Destructor** – delete all nodes in the list
- **getLength** accessor
- **getNodeValue** accessor – should return a Creature
- **appendNode** – appends a node containing the value passed into nodeValue, to the end of the list
- **insertNode** – this function is passed a node value (Creature) and a position where the node should be inserted. The first node is position 0.
- **deleteNode** – finds the node with the argument position & deletes it

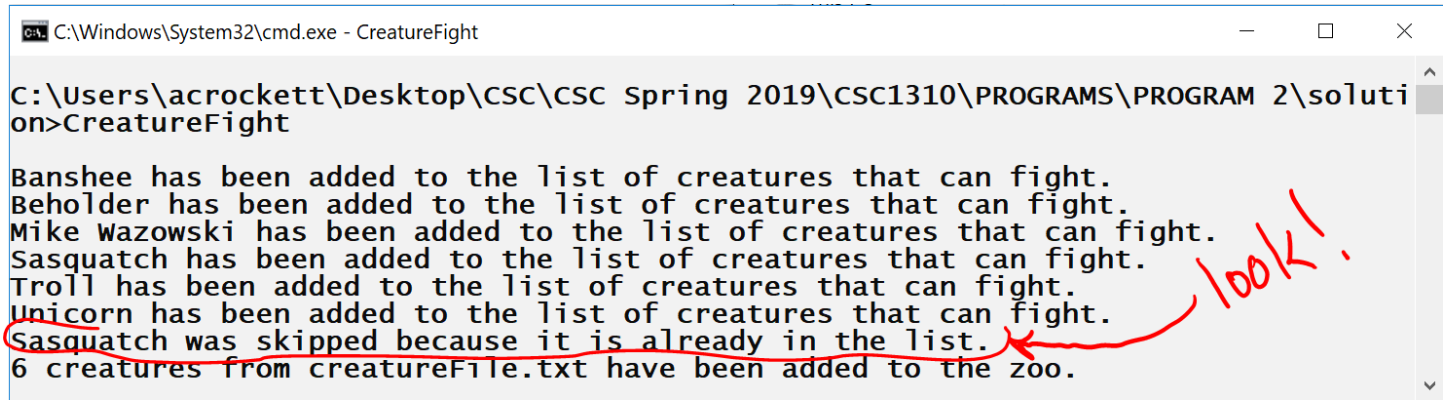
HOW TO TURN IN YOUR PROGRAM

- Zip all the files required to compile & run your program – include the **Makefile** & **creatureFile.txt**. You may modify creatureFile.txt if you want to contain different creatures.

- Upload it to the PROGRAM 2 submission folder in ilearn by the due date.

SAMPLE OUTPUT ONE – SHOWING WHOLE PROGRAM

The text that is highlighted in yellow indicate user input.



Notice that because of the binary search, Sasquatch was skipped.

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READY TO FIGHT!!
PLAYER 1 NAME:   GrapeApe
PLAYER 2 NAME:   Janie Poo


Before you have to select your creature,
do you want to print details about each one?
y
```

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C:\Windows\System32\cmd.exe
********************************************************************************

CREATURE 1:
NAME:    Banshee
DESCRIPTION:
         The English Banshee is a fairy woman who wails when death is
         approaching.They do not cause death, only mourn it.  Banshees
         are almost always female, and are usually seen with long,
         dark, black hair and pale chees.  Their eyes also are usually
         red from crying.

LIFE POINTS:    1000
HIT POINTS:     60

********************************************************************************

CREATURE 2:
NAME:    Beholder
DESCRIPTION:
         Giant center eye and twelve eye stalks above it.  It is a flying
         eyeball.  Mouth full of razor sharp teeth.  Eye stalks shoot
         various beams of magical death-dealing energy.

LIFE POINTS:    2000
HIT POINTS:     75

********************************************************************************
```

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C:\Windows\System32\cmd.exe

CREATURE 3:
NAME:    Mike Wazowski
DESCRIPTION:
         One-eyed, funny green monster.  A scare assistant to James P.
         Sullivan at Monsters, Inc.  Mike doesn't want any interruptions
         in his life.

LIFE POINTS:    2000
HIT POINTS:     25

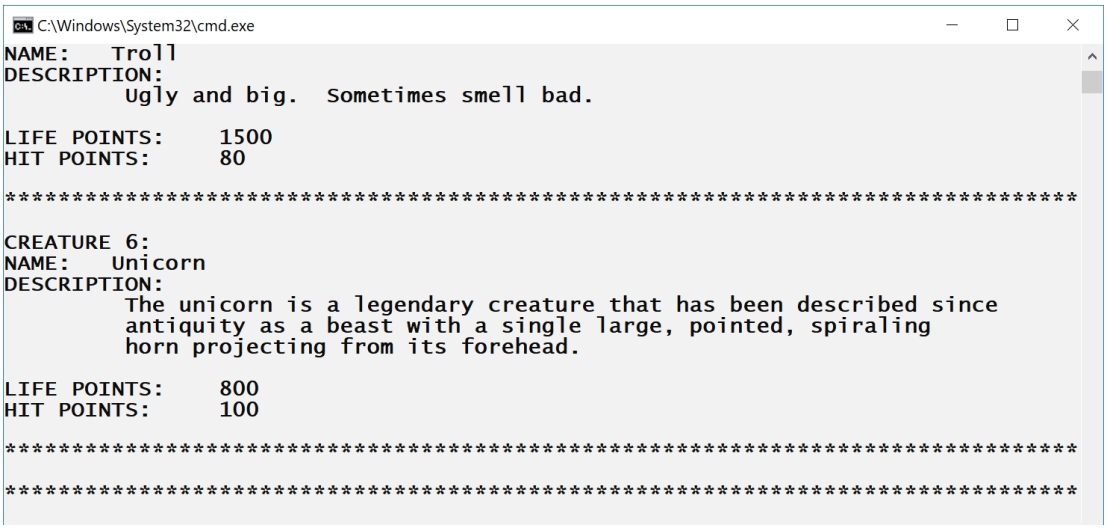
********************************************************************************

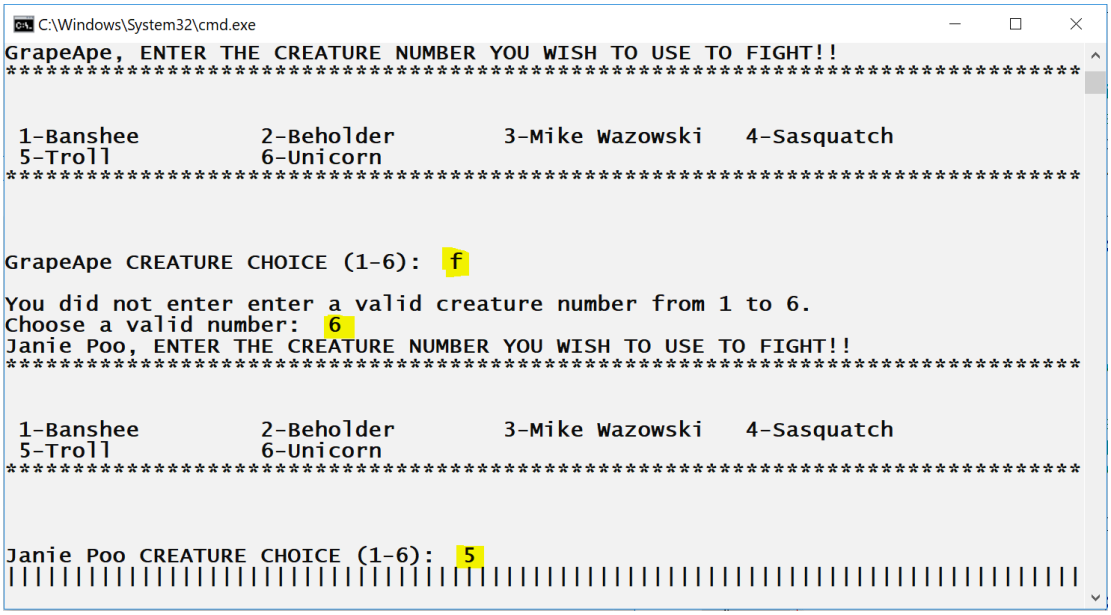
CREATURE 4:
NAME:    Sasquatch
DESCRIPTION:
         The sasquatch is also called Big Food.  Bigfoot is a cryptid
         in American folklore, supposedly a simian-like creature that
         inhabits forests, especially those of the Pacific Northwest.
         Bigfoot is usually described as a large, hairy, bipedal humanoid.

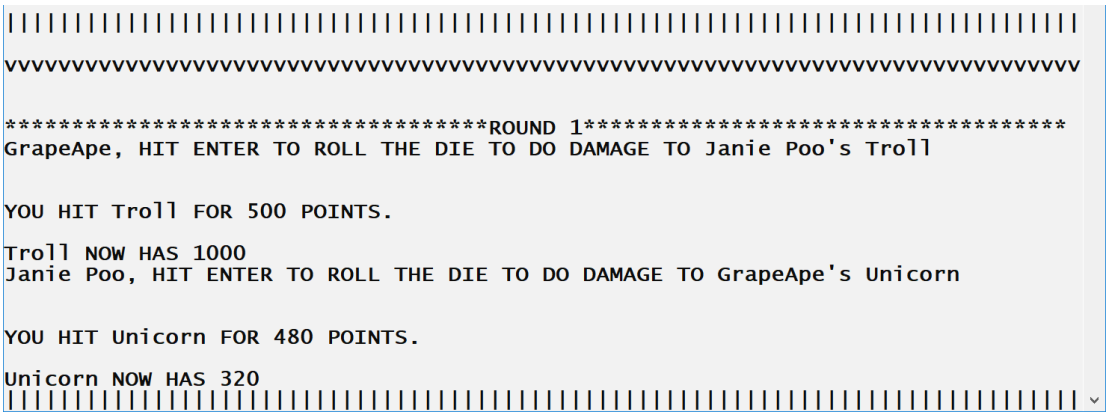
LIFE POINTS:    800
HIT POINTS:     80

********************************************************************************

CREATURE 5:
```


C:\Windows\System32\cmd.exe
NAME: Troll
DESCRIPTION:
Ugly and big. Sometimes smell bad.
LIFE POINTS: 1500
HIT POINTS: 80
****
CREATURE 6:
NAME: Unicorn
DESCRIPTION:
The unicorn is a legendary creature that has been described since
antiquity as a beast with a single large, pointed, spiraling
horn projecting from its forehead.
LIFE POINTS: 800
HIT POINTS: 100
****
****


C:\Windows\System32\cmd.exe
GrapeApe, ENTER THE CREATURE NUMBER YOU WISH TO USE TO FIGHT!!
****
1-Banshee
2-Beholder
3-Mike Wazowski
4-Sasquatch
5-Troll
6-Unicorn
****
GrapeApe CREATURE CHOICE (1-6): f
You did not enter enter a valid creature number from 1 to 6.
Choose a valid number: 6
Janie Poo, ENTER THE CREATURE NUMBER YOU WISH TO USE TO FIGHT!!
****
1-Banshee
2-Beholder
3-Mike Wazowski
4-Sasquatch
5-Troll
6-Unicorn
****
Janie Poo CREATURE CHOICE (1-6): 5


**********ROUND 1**********
GrapeApe, HIT ENTER TO ROLL THE DIE TO DO DAMAGE TO Janie Poo's Troll
YOU HIT Troll FOR 500 POINTS.
Troll NOW HAS 1000
Janie Poo, HIT ENTER TO ROLL THE DIE TO DO DAMAGE TO GrapeApe's Unicorn
YOU HIT Unicorn FOR 480 POINTS.
Unicorn NOW HAS 320

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************************************ROUND 2************************************
GrapeApe, HIT ENTER TO ROLL THE DIE TO DO DAMAGE TO Janie Poo's Troll


YOU HIT Troll FOR 500 POINTS.

Troll NOW HAS 500
Janie Poo, HIT ENTER TO ROLL THE DIE TO DO DAMAGE TO GrapeApe's Unicorn


YOU HIT Unicorn FOR 240 POINTS.

Unicorn NOW HAS 80
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************************************ROUND 3************************************
GrapeApe, HIT ENTER TO ROLL THE DIE TO DO DAMAGE TO Janie Poo's Troll


YOU HIT Troll FOR 200 POINTS.

Troll NOW HAS 300
Janie Poo, HIT ENTER TO ROLL THE DIE TO DO DAMAGE TO GrapeApe's Unicorn


YOU HIT Unicorn FOR 320 POINTS.

Unicorn NOW HAS -240
Janie Poo, Troll KNOCKED OUT Unicorn!!
YOU WON!!
```

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Would you like to play again? (y/n)     y
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READY TO FIGHT!!
PLAYER 1 NAME:  Yella Cat Crockett
PLAYER 2 NAME:  Jack Crockett


Before you have to select your creature,
do you want to print details about each one?
n

Yella Cat Crockett, ENTER THE CREATURE NUMBER YOU WISH TO USE TO FIGHT!!
********************************************************************************


 1-Banshee          2-Beholder          3-Mike Wazowski    4-Sasquatch
 5-Troll            6-Unicorn
```

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Yella Cat Crockett CREATURE CHOICE (1-6):  2
Jack Crockett, ENTER THE CREATURE NUMBER YOU WISH TO USE TO FIGHT!!
********************************************************************************


 1-Banshee          2-Beholder          3-Mike Wazowski    4-Sasquatch
 5-Troll            6-Unicorn
********************************************************************************


Jack Crockett CREATURE CHOICE (1-6):  3
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************************************ROUND 1************************************
Yella Cat Crockett, HIT ENTER TO ROLL THE DIE TO DO DAMAGE TO Jack Crockett's Mi
ke Wazowski


YOU HIT Mike Wazowski FOR 300 POINTS.

Mike Wazowski NOW HAS 1700
Jack Crockett, HIT ENTER TO ROLL THE DIE TO DO DAMAGE TO Yella Cat Crockett's Be
holder


YOU HIT Beholder FOR 75 POINTS.

Beholder NOW HAS 1925
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C:\Windows\System32\cmd.exe

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************************************ROUND 2************************************
Yella Cat Crockett, HIT ENTER TO ROLL THE DIE TO DO DAMAGE TO Jack Crockett's Mi
ke Wazowski


YOU HIT Mike Wazowski FOR 450 POINTS.

Mike Wazowski NOW HAS 1250
Jack Crockett, HIT ENTER TO ROLL THE DIE TO DO DAMAGE TO Yella Cat Crockett's Be
holder


YOU HIT Beholder FOR 125 POINTS.

Beholder NOW HAS 1800
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************************************ROUND 3************************************
Yella Cat Crockett, HIT ENTER TO ROLL THE DIE TO DO DAMAGE TO Jack Crockett's Mi
ke Wazowski


YOU HIT Mike Wazowski FOR 300 POINTS.

Mike Wazowski NOW HAS 950
Jack Crockett, HIT ENTER TO ROLL THE DIE TO DO DAMAGE TO Yella Cat Crockett's Be
holder


YOU HIT Beholder FOR 25 POINTS.

Beholder NOW HAS 1775
Yella Cat Crockett, Beholder KNOCKED OUT Mike Wazowski!!
YOU WON!!
```

C:\Windows\System32\cmd.exe

```
Would you like to play again? (y/n)     8

You did not enter either 'y' or 'n'.  Would you like to play again? (y/n)
n


GOODBYE!!
```