Robert Boespflug
Design/testing/reflection document

Original Design

Barbarian
virtual int attack ( ) override;
virtual int defense( ) override;

is -a

Creature

virtual int attack( );
virtual int defense( );
int armor_points;
int strength_points;

Creature * creatureFight(Creature *, Creature *)
void recoverHealth( )

is -a

Vampire
virtual int attack ( ) override;
virtual int defense( ) override;

is -a

Medusa
virtual int attack ( ) override;
virtual int defense( ) override;

is -a

Harry Potter
virtual int attack ( ) override;
virtual int defense( ) override;

is -a

has-a

Tournament
Queue lineup1;
Queue lineup2;
Queue loserPile;
QueueNode * frontLineup1;
QueueNode * frontLineup2;
Creature * user_defined_creature;
Creature * roundWinner;
string assignCreatureName();

void fillTwoLineups();
void fillLineup(Queue *q, int lineup);
int tournament_creatureFight();
void printLoserPile();
void printWinnerPile();

Blue Men
virtual int attack ( ) override;
virtual int defense( ) override;

has-a

Queue
QueueNode * front;
QueueNode * back;
void addBack(string name, Creature *);
QueueNode * getFront();
void removeFront();
bool isEmpty();
void printQueue();

has-a

QueueNode
string name;
Creature * creatureType;
QueueNode * next;
QueueNode * prev;
QueueNode(string name, Creature *);

Menu

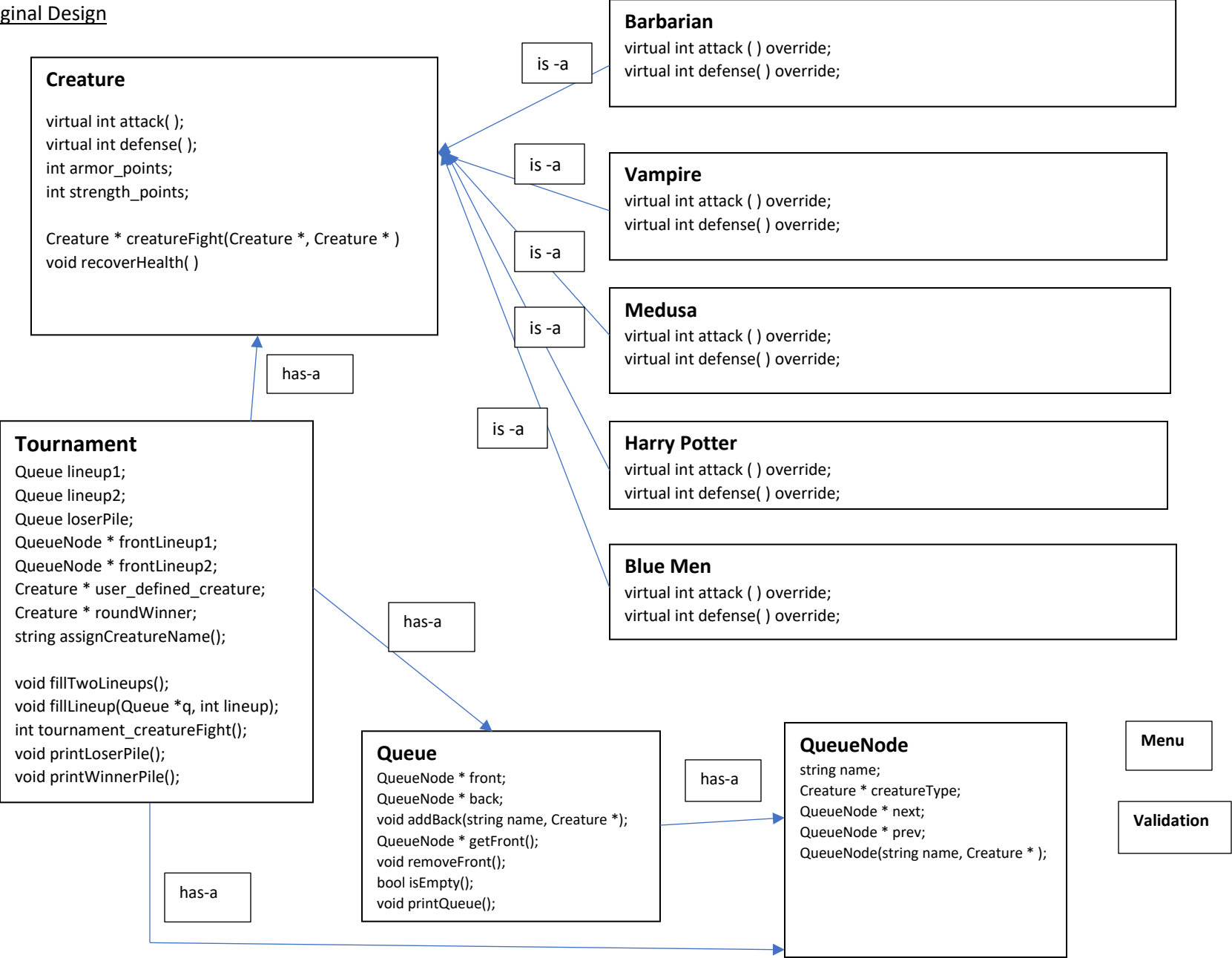**Validation**

has-a

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Problems

1. My main problem was getting rid of memory leaks. I thought that traversing the list and deleting the creatureType of every node would work just like from lab 7, although this did not seem to work out for me. I kept getting read access violation errors, I opted instead to keep track of the number of nodes in each lineup and the loser pile, then in the removeCreatures( ) function, use the size of the queue in a for loop that traversed the list for me, deleting each nodes creatureType. This seemed to finally work.

2. I first created a fillLineup() function that filled up a lineup (queue) with creature * for the nodes. I needed a way to fill up two lineups, so I created the fillTwoLineups() function that called fillTwoLineups( ) twice with the appropriate queue (lineup).

3. I was running into a lot of errors until I realized I hadn't put include guards at the top of all my header files.

Testing Plan

For testing, I my plan was to have every creature fight every other creature at least once, paying special attention to if the loser pile increased correctly as a queue, special powers used by the creatures, and the overall score and round scores. To save space on the page, this testing table only three Creatures in each lineup. The program that will be submitted will have the user enter 10 creatures into their lineups. I tested with both 10 creatures and 3 creatures in my lineups, but only the testing with three creatures in lineup is shown as 10 creature lineups take too much space.

Also, I wanted to test medusa glare but it is rare, so I had the medusa's fight against each other to increase the odds of seeing it. Finally, since it is almost impossible to beat the BlueMen and test the loss of a defense die, I had the Blue Men fight against each other.

Testing Table

What is being tested? (3 creatures per lineup for space savings)	Output from program	Stats (3 fights shown per creature fight for space savings)	Loser Pile	Special Features Activated
3 harry's vs. 3 harry's lineup1: H1 H2 H3 lineup2: H4 H5 H6	WINNING LINEUP: LINEUP2 WINNERS: H6 LOSER PILE: H1 H5 H3 H4 H2	Fight 1: H1: 0 H4: 15 Fight 2: H2: 17 H5: -1	H1 H1, H5	Fight 1: Harry Potter 1 came back to life round 18 Harry Potter 2 came back to life round 19 Fight 2: Harry Potter 1 came back to life round 7 Harry Potter 2 came back to life round 32

		Fight 3: H3: -2 H6: 8	H1, H5, H3	Fight 3: Harry Potter 1 came back to life round 5 Harry Potter 2 came back to life round 26
3 harry's vs. 3 barbarians lineup1: Harry1 Harry2 Harry3 lineup2: Barb1 Barb2 Barb3	WINNING LINEUP: LINEUP1 WINNERS: H1 H2 H3 LOSER PILE: B1 B2 B3	Fight 1: H1: 9 B1: -1 Fight 2: H2: 18 B2: 0 Fight 3: H3: 2 B3: 0	B1 B1, B2 B1, B2, B3	Fight 1: None Fight 2: Harry Potter came back to life round 11 Fight 3: Harry Potter came back to life round 13
3 harry's vs. 3 Vampires lineup1: H1 H2 H3 lineup2: V1 V2 V3	WINNING LINEUP: LINEUP1 WINNERS: H1 H2 H3 LOSER PILE: V1 V2 V3	Fight 1: H1: 18 V1: -1 Fight 2: H2: 20 V2: -1 Fight 3: H3: 2 V3: 0	V1 V1, V2 V1, V2, V3	Fight 1: Harry Potter came back to life round 7 Charm used 4 times in 12 attacks Fight 2: Harry Potter came back to life round 8 Charm used 4 times in 9 attacks Fight 3: Harry Potter came back to life round 3 Charm used 13 times in 23 attacks
3 harry's vs. 3 BlueMen lineup1: H1 h2 H3 lineup2: B1 B2 B3	WINNING LINEUP: LINEUP2 WINNERS: B1 B2 B3 LOSER PILE: H1 H2 H3	Fight 1: H1: 0 B1: 12 Fight 2: H2: -1 B2: 12	H1 H1, H2	Fight 1: H1 came back to life round 1 Fight 2: Harry Potter came back to life round 6 Fight 3: Harry Potter came back to life round 4

		Fight 3: H3: -2 B3: 12	H1, H2, H3	
3 harry's vs. 3 Medusa lineup1: h1 h2 h3 lineup2: M1 M2 M3	WINNING LINEUP: LINEUP1 WINNERS: H1 H2 H3 LOSER PILE: M1 M2 M3	Fight 1: H1: 5 M1: -1 Fight 2: H2: 1 M2: -2 Fight 3: H3: 10 M3: 0	M1 M1, M2 M1, M2, M3	Fight 1: None Fight 2: None Fight 3: None
3 harry's vs. 3 Medusa lineup1: M1 M2 M3 lineup2: M4 M5 M6	WINNING LINEUP: LINEUP1 WINNERS: M1 M3 LOSER PILE: M4 M2 M6 M5	Fight 1: M1: 4 M4: -1 Fight 2: M2: 0 M5: 2 Fight 3: M3: 11 M6: 0	M4 M4, M2 M4, M2, M6	Fight 1: None Fight 2: M5 used medusa glare round 3. Opponent immediately dead. Fight 3: None
3 BlueMen vs. 3 BueMen lineup1: B1 B2 B3 lineup2: B4 B5 B6	WINNING LINEUP: LINEUP1 WINNERS: B3 B1 LOSER PILE: B4 B2 B6 B5	Fight 1: B1: 9 B4: -5 Fight 2: B2 9 B5: -9 Fight 3:	M1 M1, M2 M1, M2, M3	Fight 1: BlueMen 1 lost a defense die. BlueMen 4 lost two defense die. Fight 2: Fight 3: Blue Men 1 lost two defense die. Blue Men 2 lost two defense die.

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		B3: -1		
		M6: 5		

Testing Reflection

The testing went as planned. The tournament is running well, with two lineups being filled with creatures and losing creatures being sent to the loser pile. The loser pile is a Queue, and it is correctly Queuing the losers in a FIFO fashion. All creatures fought at least once. I tested creatures of the same type against each other, and tested for all special powers used by the creatures, including: Vampire charm, Medusa glare, Blue Men losing die, and Harry Potter coming back to life with 20 health. The math seems correct for all fighting, stats, and round counting.