Wizard Land

Software Engineering Homework

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1 DESCRIPTION OF THE TASK

On Wizard Land wizards are wandering about. Their goal is to learn as many spells as they can.
The text of each spell is written on the wall of a cave. If a wizard wants to learn a spell, he must go into the corresponding cave and read the text of the spell.
When a wizard wants to cast a spell, he must have the required amount of manna for the spell. Manna is produced over time by the body of the wizard. However, the maximum amount of manna a wizard can accumulate is limited. If the manna amount reaches this limit, the manna production stops, and is restarted only when the manna amount falls below the limit.
A wizard can cast a spell to himself. A wizard can cast a spell to another wizard, but only if they meet and the wizard can see the other wizard. A spell is effective only for a limited time. After this time the spell is removed.
There are many kinds of spells. There is a spell that makes somebody invisible. There is a spell that lets the wizard see invisible things. There is a spell that prevents other wizards casting spell on its wearer. There is a spell that paralyzes somebody so that he cannot do anything.
Wizards can also collect relics. Relics are hidden in forests. A wizard can acquire a relic if he goes into the corresponding forest and finds it. Relics affect only the wizard who wears them. Relics perform their function as long as the wizard owns them: relics do not need manna for their operation.
There are many kinds of relics. There is a robe that makes the wizard invisible. There is a ring that doubles the manna production speed of the wizard. There is a dagger that doubles the attack force of the wizard.
Wizards can meet with each other during their journeys. When wizards meet, they can walk by each other, or they can cast a spell on themselves or on the other wizard, if they see the other. They can also choose to attack the other wizard, but only if they see him. An attack does not require manna, but the wizard who is attacked will lose some amount of his manna.
If the amount of manna of a wizard reaches zero, the wizard becomes paralyzed for a time, and he cannot do anything. After this time the manna production resumes, and the wizard can start to wander again.
While a wizard is paralyzed, a single relic can be taken from him. This relic is typically acquired by the wizard who won their battle, but if other wizards are quick enough, they have the chance to collect the relic for themselves.
The game is won by the wizard who is the first to learn all the spells. The game is played on a two-dimensional grid, and the wizards can move on the fields (free area, cave, or forest) of this grid.

2 FUNCTIONAL REQUIREMENTS

2.1 PRIMARY REQUIREMENTS

Identifier	Description	Use case
I01	Player enter the game	login
I02	Player start moving to cave to learn new spells	Go to cave Learn new spells
I03	Player going to forest to collect new relics	Go to forest Get new relic

I04	Player encounter another wizard, he can choose either walk away or attack the wizard	Meet new wizard Choose attack Walk without attack
I05	Player respwan if he losses all his manna	Respawn of player Check status of player
I06	Player losses relic if he losse the fight	Meet new wizard Choose attack Check status of player
I07	Player gain one relic if he win the fight	Meet new wizard Choose attack Check status of player
I08	Player choose to attack	Choose attack Spell and relic control
I09	Player win the game if he learn all the spells	Game over Check status of player

2.2 ADDITIONAL REQUIREMENTS

Identifier	Description	Use case

3 USE CASES

3.1 USE CASE DIAGRAM

3.2 USE CASE DESCRIPTION

Title	login
Description	Player enter the game using id and password
Actors	Wizard
Main success scenario	Player enter the game
Alternate scenario	Player reenter the details if the id or password is wrong

Title	Go to cave
Description	Plyer start moving towards the cave
Actors	Wizard
Main success scenario	Player enter the cave
Alternate scenario	Player doesn't enter the cave

Title	Learn new spells

Description	Player learn the spells
Actors	Wizard
Main success scenario	He learn the spells

Title	**Get new relic**
Description	Player obtain new relic
Actors	Wizard
Main success scenario	He get new relic

Title	**Meet new wizard**
Description	Player encounter the new wizard and he can choose either attack or no attck and pass by without attack.
Actors	Wizard

Title	**Walk without attack**
Description	Player choose to walk without attacking the wizard. He can cast a spell on himself and go without fighting or he can simply go if the new wizard didn't attack
Actors	Wizard and cpu
Main success scenario	He able to go without any attack
Alternate scenario	He didn't able to without attack

Title	**Choose attack**
Description	If player choose attack, then he will attack the wizard by using spells and relic power . and if he win he will gain a relic and if he loose the fight he will lose one relic
Actors	Wizard and cpu
Main success scenario	He win the fight
Alternate scenario	He doesn't win the fight

Title	**Spell and relic control**
Description	It will control the spells and relic specifin powers and uses of them during the game
Actors	Wizard and cpu

Title	**Check status of player**
Description	This represent the status of the player and also store and modify the data about relic and spells
Actors	Wizard and cpu
Main success scenario	It shows all the data if player
Alternate scenario	It modify and update the data of the player

Title	Respawn of player
Description	If player dies by lossing tall his manna. Then the cpu will check the staus of player and then respawn the player
Actors	Cpu
Main success scenario	Respawn player

Title	Game over
Description	The will over if the wizard learn all the spells
Actors	Wizard and cpu
Main success scenario	He learn all the spells and game over

4 STRUCTURAL DESCRIPTION

4.1 DESCRIPTION OF THE CLASSES

4.1.1 Wizard
Responsibilities

In this class wizard can cast spell,use relic and attack another wizard he can move in the game. he must have the required amount of manna for the spell. Manna can't be more than the maximum manna and it can restart the manna when it's below the limit.

Attributes

-manna:long	Store the value of current manna of the wizard
-relic:long	No of relics wizard have
-spells:long	No of spells wizard have
-attackForce:long	Amount of attack force he have
-time:long	Time for production of manna

Methods

+move(d:direction)	Wizard can move in the game using this method
+status()	Print the current data of the wizard
+addRelic(r:long)	Increase the no of relic of wizard
+add_spells(s:long)	Increase the spells learned
+respawn()	Start new game if wizard dies
+attack()	Ask wizard what to use for attack. attack another wizard using relic and spells and add one relic if he wins and decrease one relic if he loses
+removeRelic(r2:long)	Decrease the no of relic
+noAttack	Wizard doesn't attack and pass by without losing any relic and without using any spells and manna.
+use_spells(s1:long)	Use the spells according to the spell no. and use manna
+use_relic(r1:long)	Use the relic according to relic no.
+mannaControl(m:long)	Control the manna, increase the manna depend upon the relic used and decrease the manna depends upon the spell and check the manna max and min limit of manna and restart the manna if the manna is decrease .

4.1.2 Spell_Controller
Responsibilities

The spell that makes somebody invisible. There is a spell that lets the wizard see invisible things. There is a spell that prevents other wizards casting spell on its wearer. There is a spell that paralyzes somebody so that he cannot do anything. Spell can work for a limited time.

Methods

+mannaCentere(m:long)	It cotrols the manna, manna decrease if spells is used.
+invisibleSpell()	Make wizard invisible by hiding his things
+seeInvisible()	Open the details of the invisible wizard no 2.
+protectSpell()	Nothing will change if the wizard no 1 hits with a spell
+paralyzeSpell()	Stop the function of movement of the wizard no 2 if it hits by this spell
+spellRemover()	Spell will stop functioning after some time

4.1.3   relic_Controller
Responsibilities

There is a robe that makes the wizard invisible. There is a ring that doubles the manna production speed of the wizard. There is a dagger that doubles the attack force of the wizard.

Methods

+invisibleRobe()	Make wizard hide to wizard no2 . he can't get know about the movement of the wizard no 1.
+ringRelic(m:long,t:long)	Increase the manna of the wizard by double rate of time
+daggerRelic(a:long)	Increase the attack force by twice

4.1.4   Attack
Responsibilities

An attack does not require manna, but the wizard who is attacked will lose some amount of his manna. If the amount of manna of a wizard reaches zero, the wizard becomes paralyzed for a time, and he cannot do anything. After this time the manna production resumes, and the wizard can start to wander again. While a wizard is paralyzed, a single relic can be taken from him.
Methods

+win()	Increase no of relic
+losse()	Decrease no of relic and stop the movement of wizard for some time if the manna reach to zero
+fightAgain()	Check the manna of the wizard if it's not zero he can choose to fight again. And using relic and spells
+chooseAttack()	Choose spell and relic for attack and check for valid input
+fightAgain()	Ask user to fight again if the manna of the wizard2 is not zero

4.1.5   manna_Controller
Responsibilities

 wizard must have the required amount of manna for the spell. Manna is produced over time by the body of the wizard. However, the maximum amount of manna a wizard can accumulate is limited. If the

manna amount reaches this limit, the manna production stops, and is restarted only when the manna amount falls below the limit.

Methods

+manna_increment(m:long)	Increase manna of the wizard with the rate of the time
+manna_decrement(m1:long)	Decrease the manna if the manna is used by the spell or attacked by another wizard
+manna_checker(m2:long)	Check manna if its below zero or not and check manna if it's over the maximum manna limit
+manna_restart(m3:long)	Increase the mana if its less than the max manna limit with the rate of time

4.1.6   Check_status
Responsibilities

Print the data of current status of wizard

Methods

+printData()	Print the data of the wizard at the current time.

4.1.7   Control
Responsibilities

it allowed user to control the wizard

Methods

+move(d:direction)	It use the enumeration called direction to move the wizard up , down, left and right
+controlWizard2()	It control the wizard2 during the meeting the user wizard in a attack and it have same skills as the user wizard and it control by the cpu.
+attack()	Wizard attack the wizard2 and decide lose and win of the match by accessing the attack class.
+passby()	Wizard pass by without attacking and doesn't change amything
+seeStatus()	Print the data of the wizard at the current time
+useSpell(s:long)	It uses the methods of the class spell_controller and decide what to do according to spell no
+useRelic(r:long)	It uses the methods of the class relic_controller and decide what to do according to relic no

4.1.8   Direction(enumeration)
This enumeration lists the possible neighboring directions of a wizard: Up, Down, Left or Right.

4.1.9   gameOver
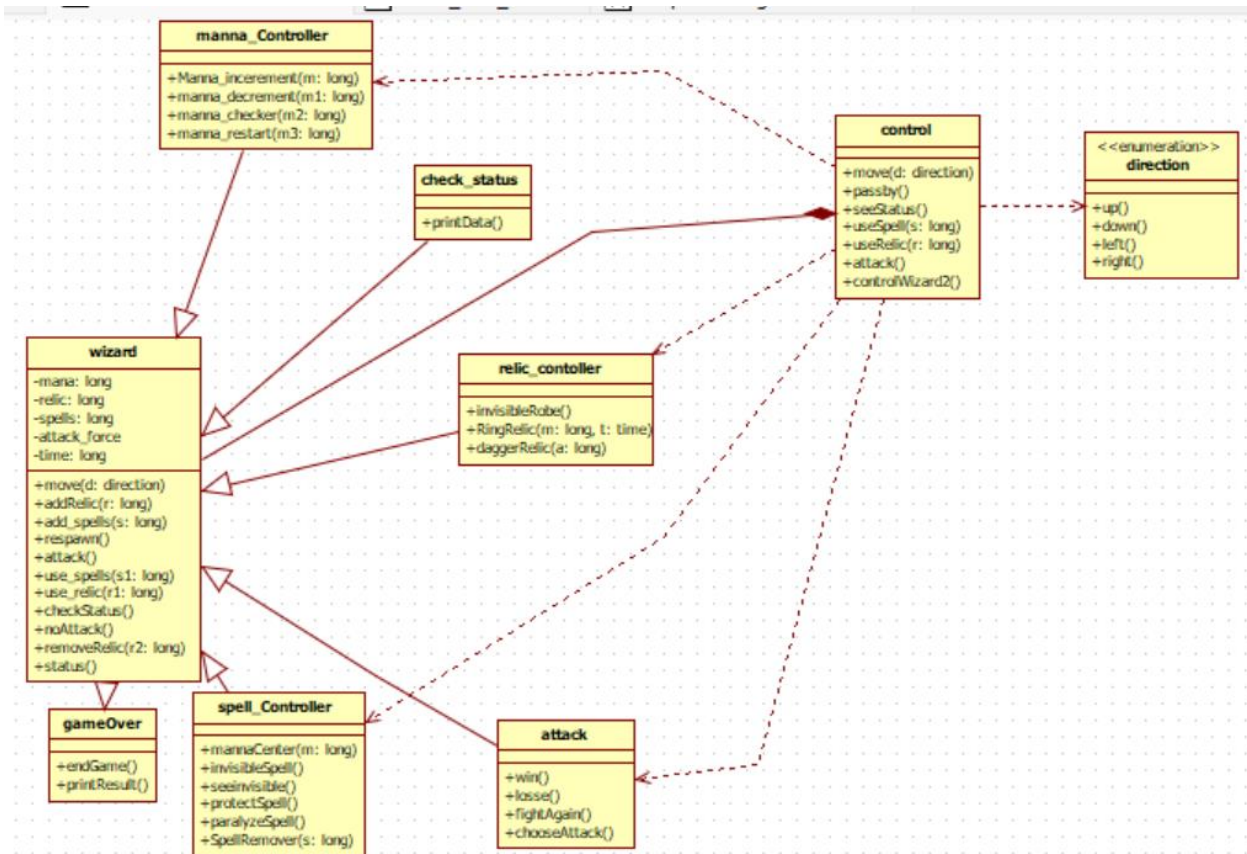**Responsibilities**

 The game is over by the wizard who is the first to learn all the spells.

Methods

+endgame()	It stops the game.
+printResult()	It print the result of the game.

4.2 CLASS DIAGRAM

5 BEHAVIORAL DESCRIPTION
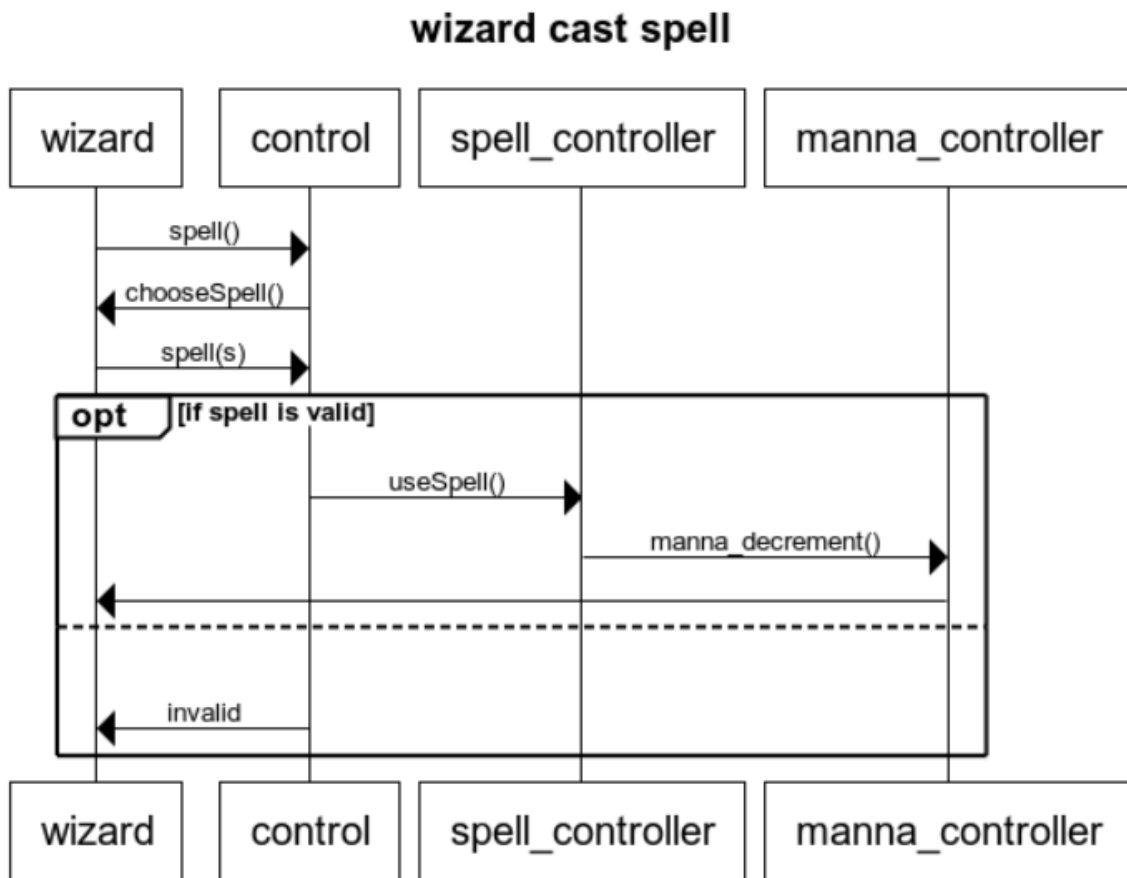
5.1 SEQUENCE DIAGRAMS

5.1.1 Wizard move
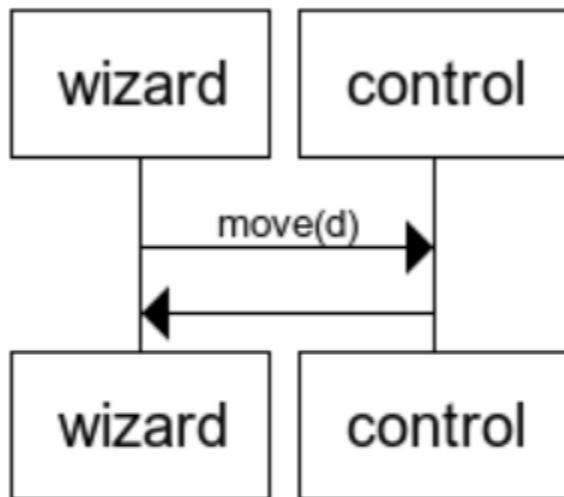
www.websequencediagrams.com

5.1.2   Wizard attack

wizard attack
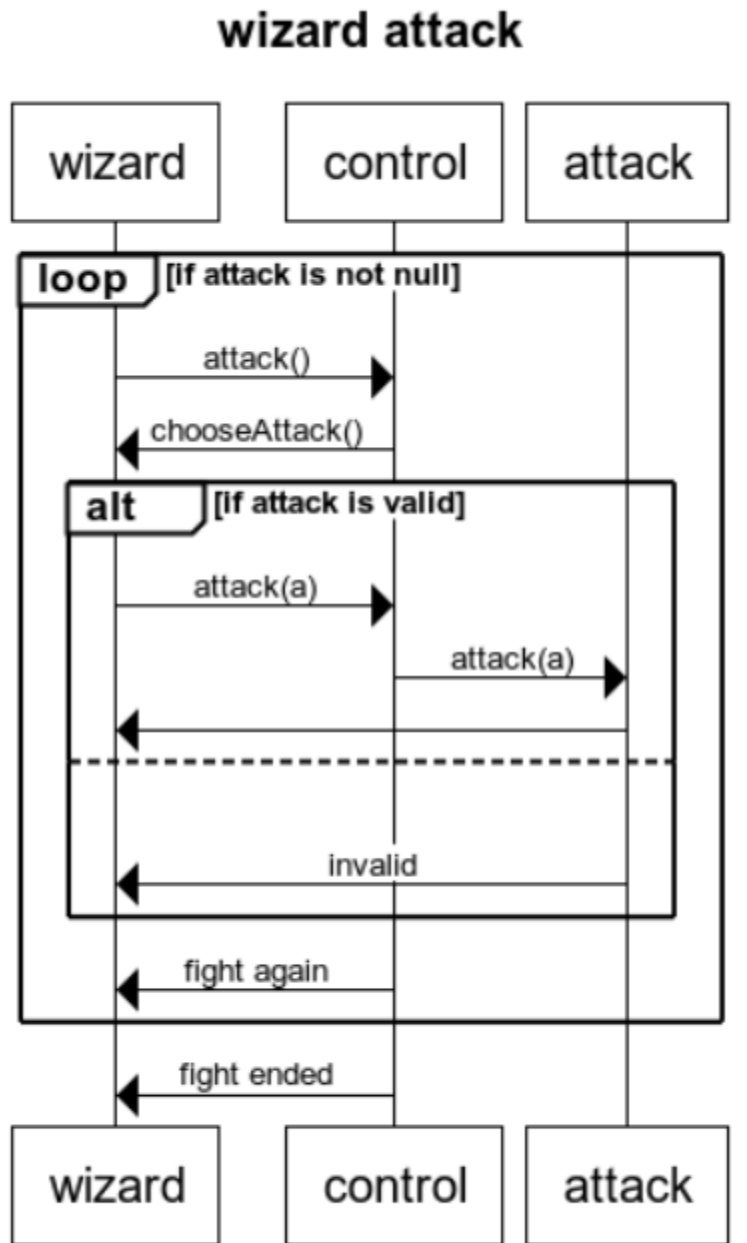
www.websequencediagrams.com

5.1.3 Wizard cast spell

wizard cast spell

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5.1.4   Wizard use relic

wizard use relic
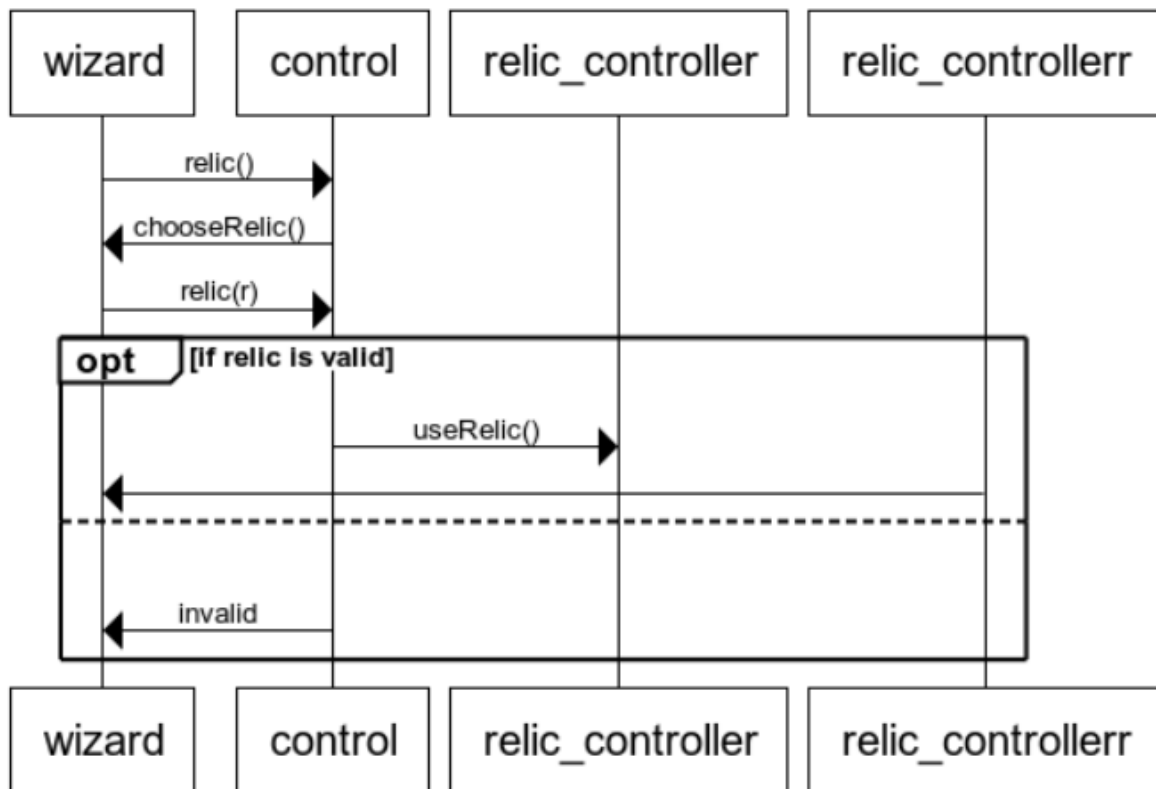
5.1.5   Wizard go to forest

wizard go to forest

wizard	control	relicController

go_to_forest →

← choose relic

relic(r) →

relic(r) →

←
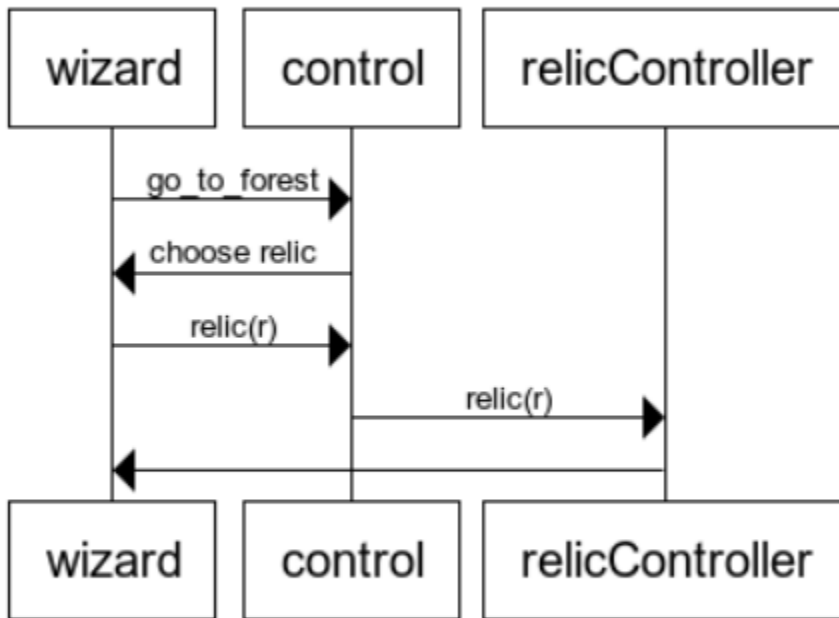
www.websequencediagrams.com

5.1.6   Wizard go to cave

wizard go to cave
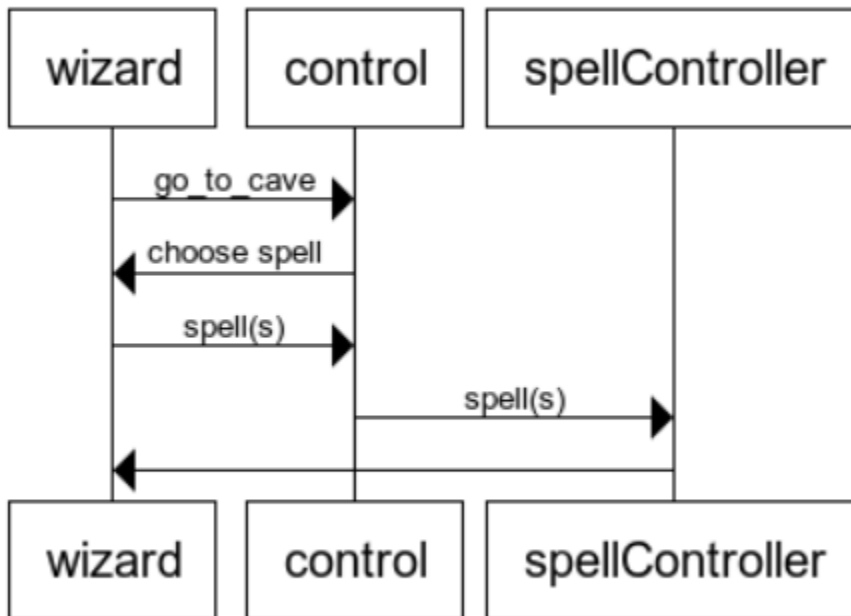
www.websequencediagrams.com

5.1.7 Game over

game over

endgame()

checkStatus()

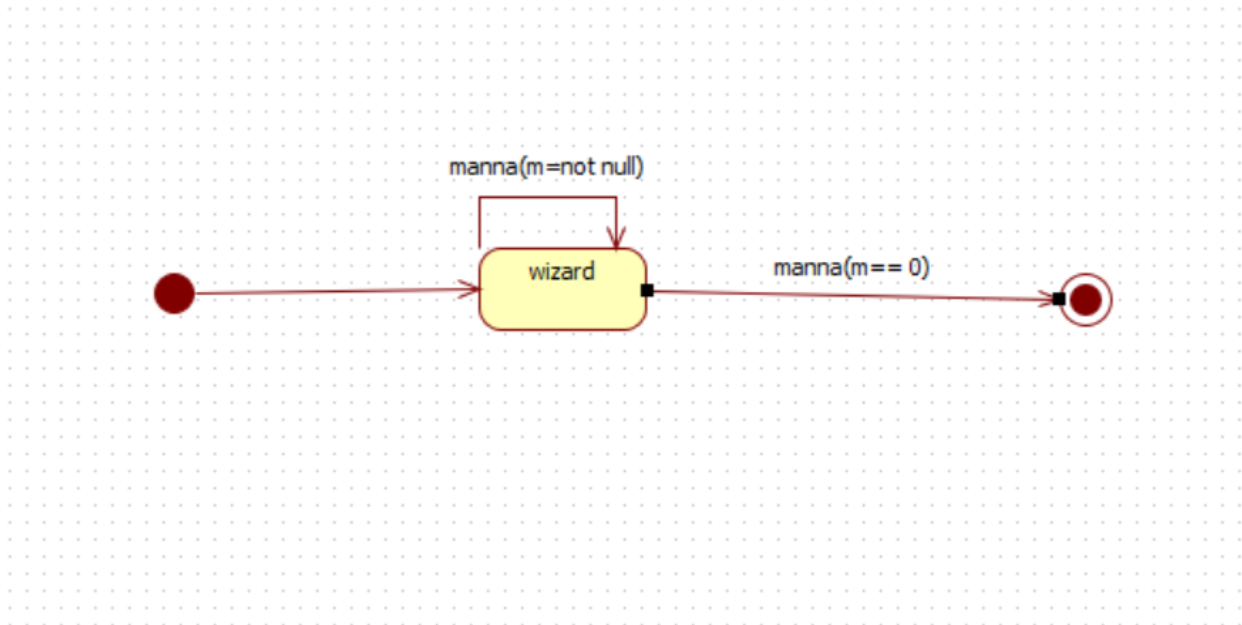opt [if spells = 4]
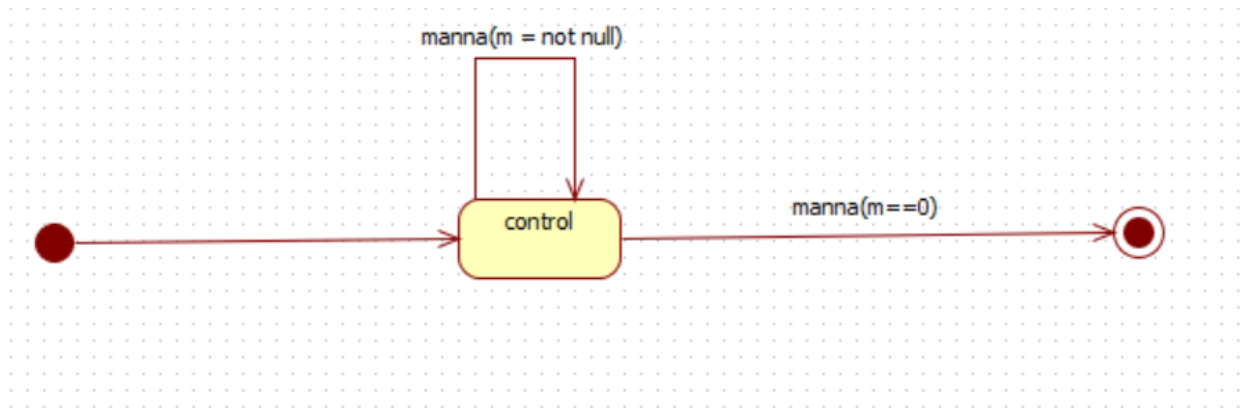
end game()

need more spells
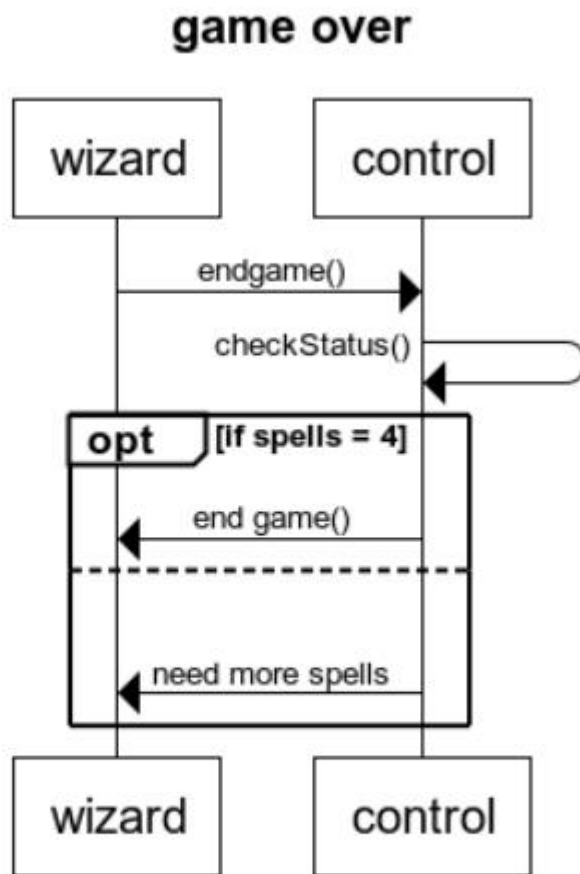
www.websequencediagrams.com

5.2 STATE MACHINE DIAGRAMS

5.2.1 Wizard life

5.2.2 control

6 WORK ACTIVITY LOG

Start	Duration	Work performed	References
25/10/2021	4	Description,functional requriments andUse case	1,2,3
28/10/2021	3	Class diagram	4.1 and 4.2
4/11/2021	3	Sequence diagram	5.1
7/11/2021	2	State machine diagram and some documentation error	5.2

Total work activity: 12

Modeling tool: WhiteStarUML

Other tools: https://www.websequencediagrams.com/