

Java大作业

一、项目描述

利用Java语言的知识点，来实现一个小游戏。这个游戏的规则如下：游戏区域是一个2D网格，玩家(你)从一个角落初始化位置，三个怪物从其他三个角落分别初始化位置。在每一轮，你可以将玩家上下左右移动一步，怪物也会随机移动一步。如果玩家试图移动到怪物占据的位置，那么玩家就是在攻击怪物，如果攻击成功，怪物将失去50点生命值；如果怪物试图移动到玩家占据的位置，那么怪物就是在攻击玩家，如果攻击成功，玩家将失去20点生命值。

一开始，玩家和怪物各有100点生命值。当生命值为0时，角色就会死亡。你在游戏中的目标是在怪物击败你之前击败它们，下图1展示了这款游戏：

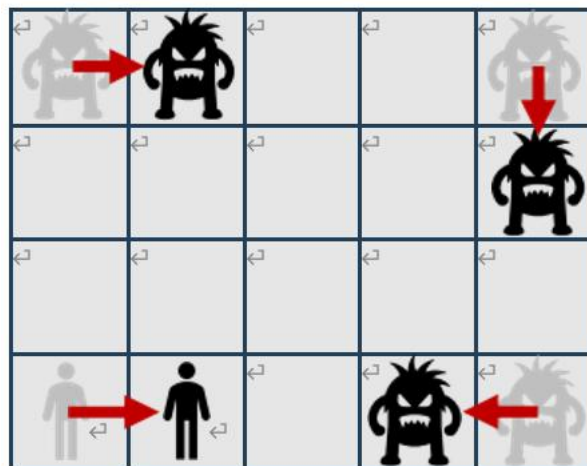


图1 游戏插图

二、功能设计

2.1 实现游戏地图

首先，该功能需要实现一个游戏地图，下图为在控制台中打印的3行3列的网格地图

```
...  
...  
...
```

同时，需要将每个游戏角色展现在地图上的各个位置，玩家应该被放置在右下角，怪物应该在剩下的三个角落里（右上角位置为1号怪物，左下角位置为2号怪物，左上角位置为3号怪物），如下图所示(使用符号“%”表示怪物，“*”表示玩家)：

```

%.%
. . .
%.*

```

2.2 实现游戏控制和基本规则

① 首先，玩家通过控制台输入 “up”, “down”, “left”, or “right”实现位置移动。

如果输入除上述方向以外的值，应在控制台打印: "Use only keywords up, down, left, right."

如果游戏角色(玩家、怪物)试图移动到墙上(即移动的位置超出了地图中的边界位置)，应在控制台打印“You can't go right. You lose a move.”, “You can't go left. You lose a move.”, “You can't go up. You lose a move.”, “You can't go down. You lose a move.”, 此时该角色本轮的移动已结束，无法继续移动。

② 怪物移动的方向是随机的，也就是说，怪物会在“上”，“下”，“左”，“右”中选择一个方向进行移动(每个选择的概率相等)，你需要编写程序实现相应的方法使其自动移动，这样玩家首先使用控制台输入方向进行移动，然后所有活的怪物(生命值高于 0 的怪物)根据随机的方向自动移动，每个角色所执行的移动过程都应该在控制台打印出来。

角色移动的例子如下图所示，在控制台上，首先展示每个角色开始所处的位置：

```

%.%
. . .
%.*

```

```

Round 1
up
Player is moving up
Monster1 is moving left
Monster2 is moving right
Monster3 is moving down

```

```

.%.
%.*
.%.

```

Round 2

③ 当一个怪物试图移动到一个被另一个怪物占领的地方时，也是无法移动的，应在控制台打印 "Monster already there so it cannot move."，如果怪物不能移动，它就会停留在原来的位置，输出的示例可能如下所示：

```
%.%
```

```
%.*
...

```

Round 1

up

Player is moving up

Monster1 is moving left

Monster2 is moving up

Monster3 is moving down

Monster already there so it cannot move

```
%%.
```

```
%.*
```

```
...
```

Round 2

2.3 实现完整的游戏规则

① 在角色的每一轮移动中，程序打印每个角色的健康状态，一个输出示例可能如下所示：

```
%.%
```

```
%.*
...

```

Round 1

up

Player is moving up

Monster1 is moving left

Monster2 is moving up

Monster3 is moving down

Monster already there so can't move

Health Player: 100

Health Monster1: 100

Health Monster2: 100

Health Monster3: 100

```
%%.
```

```
%.*
```

```
...
```

Round 2

② 更新代码，当玩家角色试图移动到一个有怪物的位置时，将尝试攻击，怪物进行防御（防御的结果是随机决定的，成功和失败的几率都是50%，提示:你可以使用java.util.Random包中的方法来决定随机结果），如果防御不成功，怪物的生命值就会受到伤害，攻击成功后，怪物会损失 50 点生命值，用适当的消息更新控制台。

- ③ 当怪物角色试图移动到玩家的位置时，将尝试攻击，玩家角色进行防御（防御的结果是随机决定的，成功和失败的几率都是50%，提示:你可以使用`java.util.Random`包中的方法来决定随机结果），如果防御不成功，玩家角色的生命值就会受到伤害，攻击成功后，玩家角色会损失 20 点生命值，用适当的消息更新控制台。
- ④ 当攻击后怪物的生命值达到0时，地图上怪物的标志“%”字符会变成“x”，标记一个死去的怪物。死亡的怪物无法移动，也无法再次被攻击，如果玩家试图攻击一个生命值为 0 的怪物，就在控制台打印“Character already dead.”。
- ⑤ 在没有活的怪物时，通过打印一条消息"YOU WIN!"来通知玩家获胜，同样如果玩家角色的生命值达到 0，会在控制台打印"YOU LOSE!"

三、 作业要求

在报告中具体描述项目的总体设计，以及在项目开发过程中面临的挑战，请详细描述系统每个功能的具体实现，可以使用代码片段和屏幕截图(需要使用清晰的截图)来描述你所实现的功能所需的每个详细步骤。

游戏运行的一个例子如下:

%.%

%.
%.*

Round 1

up

Player is moving up

Monster1 is moving up

You can't go up. You lose a move

Monster2 is moving left

You can't go left. You lose a move

Monster3 is moving down

Health Player: 100

Health Monster1: 100

Health Monster2: 100

Health Monster3: 100

%.
%.
%.
%.*

Round 2

up

Player is moving up

!!MISS!! Monster1 successfully defended attack from Player

Monster1 is moving down

!!MISS!! Player successfully defended attack from Monster1

Monster2 is moving up

Monster already there so can't move

Monster3 is moving right

Health Player: 100

Health Monster1: 100

Health Monster2: 100

Health Monster3: 100

%.
%.
%.
%.
%.*

Round 3

up

Player is moving up

!!MISS!! Monster1 successfully defended attack from Player

Monster1 is moving up

You can't go up. You lose a move

Monster2 is moving up

Monster3 is moving left

Monster already there so can't move

Health Player: 100
Health Monster1: 100
Health Monster2: 100
Health Monster3: 100

.%
%/%*
...

Round 4
left
Player is moving left
!!HIT!! Player successfully attacked Monster3
Monster1 is moving left
Monster2 is moving left
You can't go left. You lose a move
Monster3 is moving left
Monster already there so can't move

Health Player: 100
Health Monster1: 100
Health Monster2: 100
Health Monster3: 50

.%
%/%*
...

Round 5
left
Player is moving left
!!MISS!! Monster3 successfully defended attack from Player
Monster1 is moving left
Monster2 is moving down
Monster3 is moving up

Health Player: 100
Health Monster1: 100
Health Monster2: 100
Health Monster3: 50

%%.
%. *
%. .

Round 6
up
Player is moving up
Monster1 is moving left
You can't go left. You lose a move
Monster2 is moving right

Monster3 is moving up
You can't go up. You lose a move

Health Player: 100
Health Monster1: 100
Health Monster2: 100
Health Monster3: 50

%%*

·%·
·%·

Round 7

left

Player is moving left

!!MISS!! Monster3 successfully defended attack from Player

Monster1 is moving right

Monster already there so can't move

Monster2 is moving down

You can't go down. You lose a move

Monster3 is moving up

You can't go up. You lose a move

Health Player: 100
Health Monster1: 100
Health Monster2: 100
Health Monster3: 50

%%*

·%·
·%·

Round 8

left

Player is moving left

!!MISS!! Monster3 successfully defended attack from Player

Monster1 is moving down

Monster2 is moving right

Monster3 is moving down

Health Player: 100
Health Monster1: 100
Health Monster2: 100
Health Monster3: 50

·%· *
%%%
·%·

Round 9

left

Player is moving left
Monster1 is moving left
You can't go left. You lose a move
Monster2 is moving right
You can't go right. You lose a move
Monster3 is moving right

Health Player: 100
Health Monster1: 100
Health Monster2: 100
Health Monster3: 50

· · *
% · %
· · %

Round 10

left
Player is moving left
Monster1 is moving down
Monster2 is moving left
Monster3 is moving left

Health Player: 100
Health Monster1: 100
Health Monster2: 100
Health Monster3: 50

* · ·
· %
% %

Round 11

down
Player is moving down
Monster1 is moving left
You can't go left. You lose a move
Monster2 is moving right
Monster3 is moving right

Health Player: 100
Health Monster1: 100
Health Monster2: 100
Health Monster3: 50

· · ·
* · %
% · %

Round 12

down

Player is moving down
!!HIT!! Player successfully attacked Monster1
Monster1 is moving down
You can't go down. You lose a move
Monster2 is moving up
Monster already there so can't move
Monster3 is moving left

Health Player: 100
Health Monster1: 50
Health Monster2: 100
Health Monster3: 50

·%·
*%·
%.%

Round 13
down
Player is moving down
!!MISS!! Monster1 successfully defended attack from Player
Monster1 is moving down
You can't go down. You lose a move
Monster2 is moving right
You can't go right. You lose a move
Monster3 is moving left
!!HIT!! Monster3 successfully attacked Player

Health Player: 80
Health Monster1: 50
Health Monster2: 100
Health Monster3: 50

·%·
*%·
%.%

Round 14
right
Player is moving right
!!HIT!! Player successfully attacked Monster3
Monster1 is moving up
!!MISS!! Player successfully defended attack from Monster1
Monster2 is moving right
You can't go right. You lose a move

Health Player: 80
Health Monster1: 50
Health Monster2: 100
Health Monster3: 0

...
*X.
%.%

Round 15
down
Player is moving down
!!HIT!! Player successfully attacked Monster1
Monster2 is moving down
You can't go down. You lose a move

Health Player: 80
Health Monster1: 0
Health Monster2: 100
Health Monster3: 0

...
*X.
X.%

Round 16
up
Player is moving up
Monster2 is moving up

Health Player: 80
Health Monster1: 0
Health Monster2: 100
Health Monster3: 0

*...
.X%
X..

Round 17
right
Player is moving right
Monster2 is moving down

Health Player: 80
Health Monster1: 0
Health Monster2: 100
Health Monster3: 0

. * .
. X .
X. %

Round 18
right
Player is moving right
Monster2 is moving right

You can't go right. You lose a move
Health Player: 80

Health Monster1: 0
Health Monster2: 100
Health Monster3: 0

```
..*  
.X.  
X.%
```

Round 19
down
Player is moving down
Monster2 is moving up
!!HIT!! Monster2 successfully attacked Player

Health Player: 60
Health Monster1: 0
Health Monster2: 100
Health Monster3: 0

```
...  
.X*  
X.%
```

Round 20
down
Player is moving down
!!HIT!! Player successfully attacked Monster2
Monster2 is moving left

Health Player: 60
Health Monster1: 0
Health Monster2: 50
Health Monster3: 0

```
...  
.X*  
X%.  

```

Round 21
down
Player is moving down
Monster2 is moving up
Monster already there so can't move

Health Player: 60
Health Monster1: 0
Health Monster2: 50
Health Monster3: 0

···
·X·
X%*

Round 22

left

Player is moving left

!!MISS!! Monster2 successfully defended attack from Player

Monster2 is moving left

Monster already there so can't move

Health Player: 60

Health Monster1: 0

Health Monster2: 50

Health Monster3: 0

···
·X·
X%*

Round 23

left

Player is moving left

!!MISS!! Monster2 successfully defended attack from Player

Monster2 is moving down

You can't go down. You lose a move

Health Player: 60

Health Monster1: 0

Health Monster2: 50

Health Monster3: 0

···
·X·
X%*

Round 24

left

Player is moving left

!!HIT!! Player successfully attacked Monster2

Health Player: 60

Health Monster1: 0

Health Monster2: 0

Health Monster3: 0

YOU WIN!

···
·X·
XX*