Student Name: Kim Zhang
Student ID: A01374508

Game Flowchart

```
                          START

              create the character
              using MAKE_CHARACTER()

              make a 10x10 board with different rooms
              using MAKE_BOARD(level)

              set character's goal as not achieved

              check if character is alive and sane with
              IS_ALIVE_AND_SANE(character)

              character is alive and sane ──False──▶ output "YOU FAILED. The port town
                                                     remains in ruins, shrouded in
                                                     thick fog and hidden among
                   │True                             treacherous reefs under an eerie
                                                     sky. In this desolate place, no
              check if character has achieved goal with    one remembers your existence"
              GOAL_ATTAINED(character)

              character not achieved goal ──False──▶ character level == 3 ──True──▶ output "You survived"  ──▶  END
                   │True
              describe the character's current location
              using DESCRIBE_CURRENT_LOCATION(character,
              board)

              current location is "empty room" ──False──▶ current location is "door" ──True──▶ open the door with OPEN_DOOR(character)
                   │True                                          │False                                              │
                                                             read the runes with READ_RUNES(character)    check if level up with
                                                                                                          CHECK_LEVEL_UP(character) ──▶ character level up
              ask for user's choice of moving
              direction with GET_CHOICE()

              GET_CHOICE()

              choice = user's choice of direction

              validate if user can move towards the
              chosen direction with
              VALIDATE_MOVE(character, choice)

              user can move towards the chosen direction ──False──▶ output "You can't go this way"
                   │True
              character moves into the new room with
              MOVE_CHARACTER(character, choice)

              tell if meet Madness, Prophets, or nothing
              with MAD_OR_PROPHET(level)

              meet Madness ──False──▶ meet Prophet
                   │True                  │True
              tell if win the fight with      tell if win the fight with
              CHECK_WIN(character)            CHECK_LEARN(character)

              check if level up with
              CHECK_LEVEL_UP(character)

              character level up

                   │False
              decide text with
              DECIDE_TEXT()

              output text
```

Student Name: Kim Zhang
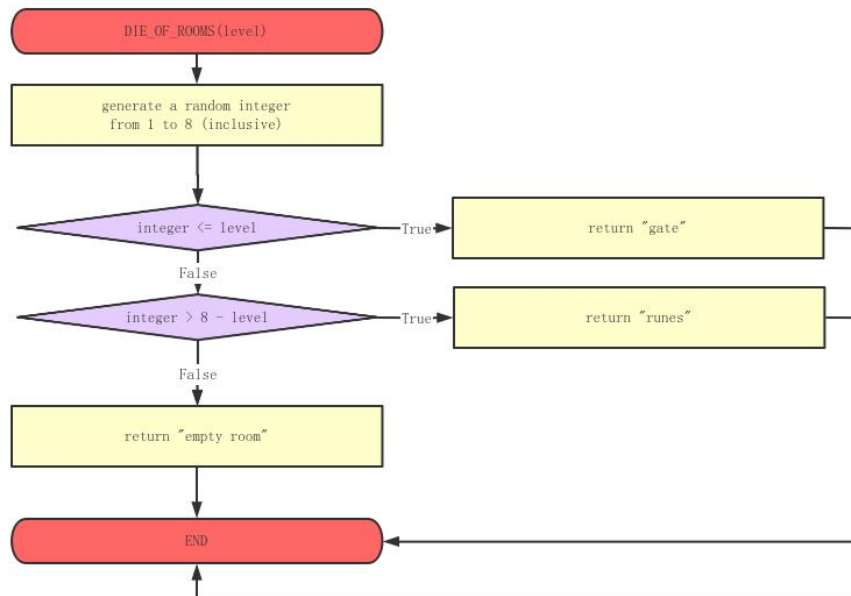Student ID: A01374508

Initiate Character Flowchart

```
┌─────────────────────────────────────┐
│         MAKE_CHARACTER()             │
└─────────────────────────────────────┘
                  │
                  ▼
┌─────────────────────────────────────┐
│   set character's x-coordinate as 0  │
└─────────────────────────────────────┘
                  │
                  ▼
┌─────────────────────────────────────┐
│   set character's y-coordinate as 0  │
└─────────────────────────────────────┘
                  │
                  ▼
┌─────────────────────────────────────┐
│      set character's HP as 10        │
└─────────────────────────────────────┘
                  │
                  ▼
┌─────────────────────────────────────┐
│    set character's sanity as 10      │
└─────────────────────────────────────┘
                  │
                  ▼
┌─────────────────────────────────────┐
│   set character's experience as 0    │
└─────────────────────────────────────┘
                  │
                  ▼
┌─────────────────────────────────────┐
│     set character's level as 1       │
└─────────────────────────────────────┘
                  │
                  ▼
┌─────────────────────────────────────┐
│        return the character          │
└─────────────────────────────────────┘
                  │
                  ▼
┌─────────────────────────────────────┐
│               END                    │
└─────────────────────────────────────┘
```
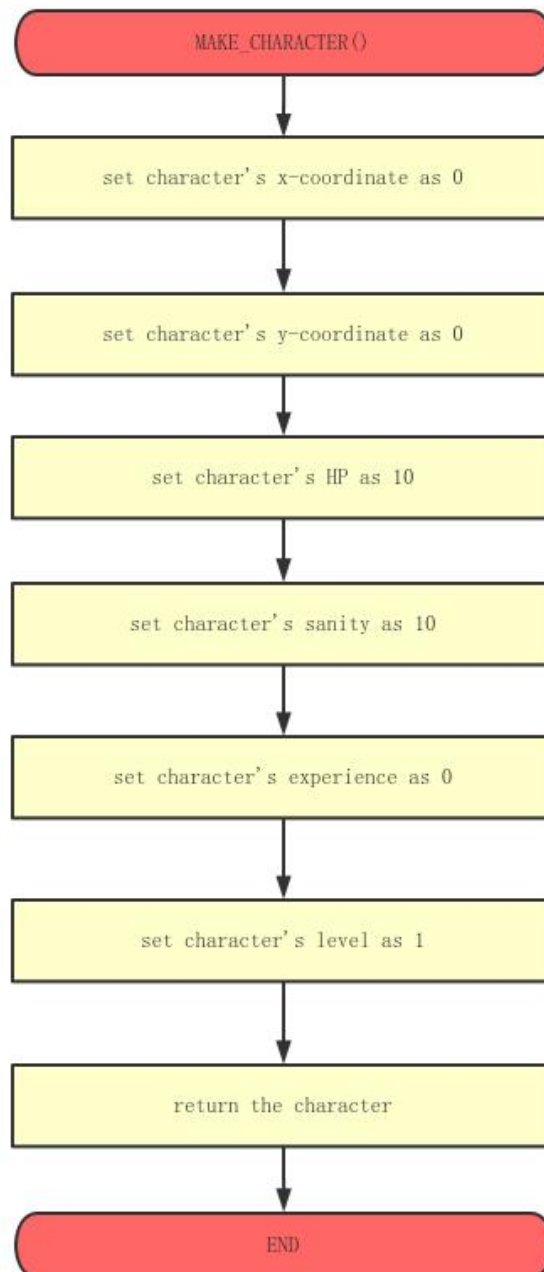
Student Name: Kim Zhang
Student ID: A01374508

Initiate Game Board (Map) Flowchart

```
MAKE_BOARD(level)
        |
        v
initiate a 10x10 board in the form of key-
            value pairs
        |
        v
set coordinate as keys in form of (x,y) where
          x and y from 0-9
        |
        v
roll a die, set the room description based
  on result with die_of_rooms(level)
        |
        v
set "empty room" as values for (0,0)
        |
        v
      return the board
        |
        v
        END
```
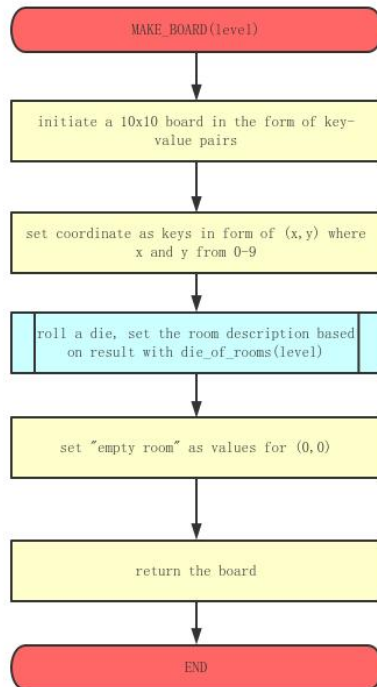
Generate Room Description by Level Flowchart

```
DIE_OF_ROOMS(level)
        |
        v
generate a random integer
from 1 to 8 (inclusive)
        |
        v
integer <= level  ---True--->  return "gate"
        |
      False
        v
integer > 8 - level  ---True--->  return "runes"
        |
      False
        v
return "empty room"
        |
        v
        END
```

Student Name: Kim Zhang
Student ID: A01374508

Tell If Character Is
Alive and Sane Flowchart

```
          ┌──────────────────────────────────┐
          │  IS_ALIVE_AND_SANE(character)     │
          └──────────────────────────────────┘
                          │
                          ▼
          ┌──────────────────────────────────┐
          │       get character's HP          │
          └──────────────────────────────────┘
                          │
                          ▼
          ┌──────────────────────────────────┐
          │     get character's sanity        │
          └──────────────────────────────────┘
                          │
                          ▼
                     ◇ HP > 0 ◇ ──False──▶  output "You are DEAD"
                          │
                         True
                          │
                          ▼
                   ◇ sanity > 0 ◇ ──False──▶  output "IT IS CALLING MY
                          │                    NAME, the ancient one from
                         True                  the abyss, I cannot resist
                          │                    his voice."
                          │                            │
                          │                            ▼
                          │                    output "All hail Cthulhu"
                          │                    for 5 times  ──▶  return False
                          ▼
                  ┌──────────────────┐
                  │    return True    │
                  └──────────────────┘
                          │
                          ▼
                  ┌──────────────────┐
                  │       END         │◀────────────────────
                  └──────────────────┘
```
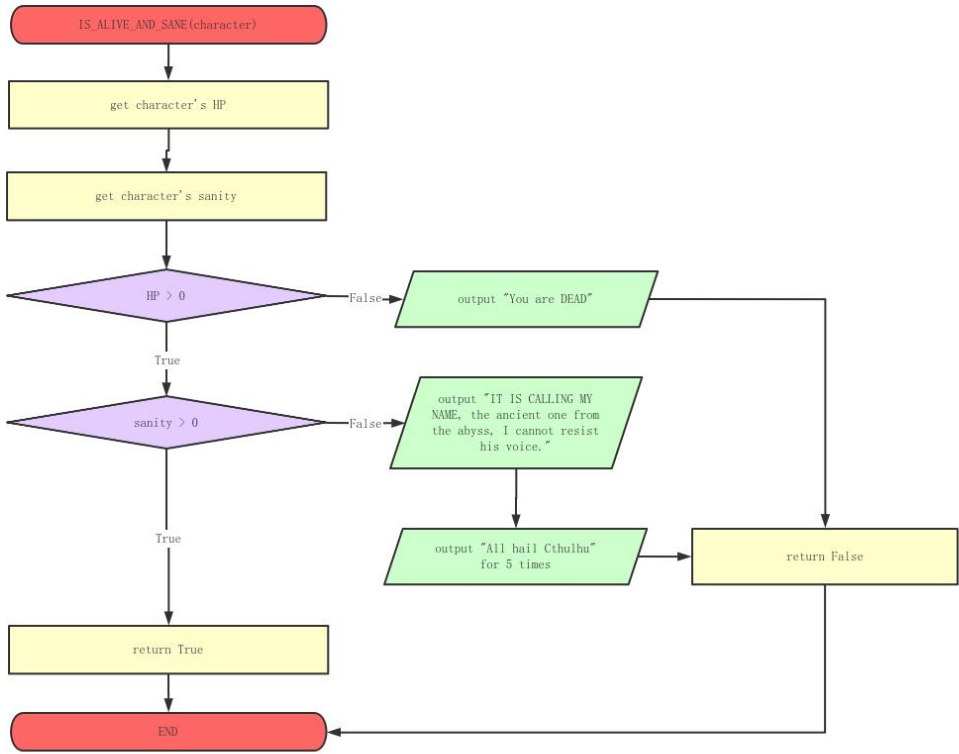
Student Name: Kim Zhang
Student ID: A01374508

Tell If Character Attained Goal Flowchart

```
              ┌──────────────────────────────────┐
              │  CHECK_IF_GOAL_ATTAINED(character) │
              └──────────────────────────────────┘
                              │
                              ▼
              ┌──────────────────────────────────┐
              │    get character's x-coordinate   │
              └──────────────────────────────────┘
                              │
                              ▼
              ┌──────────────────────────────────┐
              │    get character's y-coordinate   │
              └──────────────────────────────────┘
                              │
                              ▼
                     ╱────────────────╲
                    ╱  x-coordinate == 9 ╲
                   ⟨         AND          ⟩──False──► ┌─────────────────┐
                    ╲  y-coordinate == 9 ╱           │   return False   │
                     ╲────────────────╱              └─────────────────┘
                              │                                │
                            True                               │
                              ▼                                │
              ┌──────────────────────────────────┐            │
              │            return True            │            │
              └──────────────────────────────────┘            │
                              │                                │
                              ▼                                │
              ┌──────────────────────────────────┐            │
              │               END                 │◄───────────┘
              └──────────────────────────────────┘
```
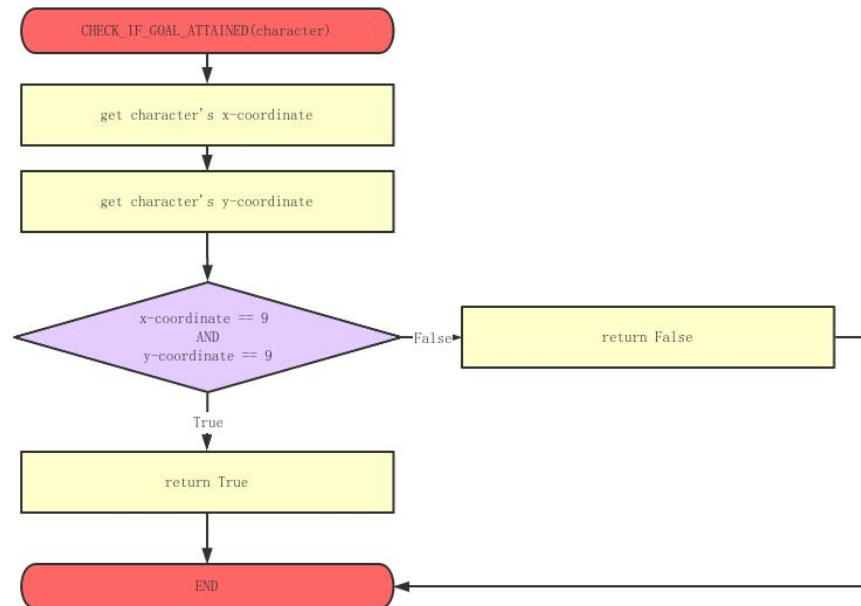
Student Name: Kim Zhang
Student ID: A01374508

Describe Character's Current Location Flowchart

```
┌─────────────────────────────────────┐
│   OPEN_DOOR(character, board)        │
└─────────────────────────────────────┘
                   │
                   ▼
┌─────────────────────────────────────┐
│    get character's x-coordinate      │
└─────────────────────────────────────┘
                   │
                   ▼
┌─────────────────────────────────────┐
│    get character's y-coordinate      │
└─────────────────────────────────────┘
                   │
                   ▼
┌─────────────────────────────────────┐
│    get character's coordinate (x,y)  │
└─────────────────────────────────────┘
                   │
                   ▼
┌─────────────────────────────────────┐
│  get description of (x,y) in the board │
└─────────────────────────────────────┘
                   │
                   ▼
  ╱─────────────────────────────────╱
 ╱  output "your location is (x,y), it ╱
╱              is: "                  ╱
╱─────────────────────────────────╱
                   │
                   ▼
  ╱─────────────────────────────────╱
 ╱       output the description      ╱
╱─────────────────────────────────╱
                   │
                   ▼
┌─────────────────────────────────────┐
│         return description           │
└─────────────────────────────────────┘
                   │
                   ▼
┌─────────────────────────────────────┐
│                END                   │
└─────────────────────────────────────┘
```
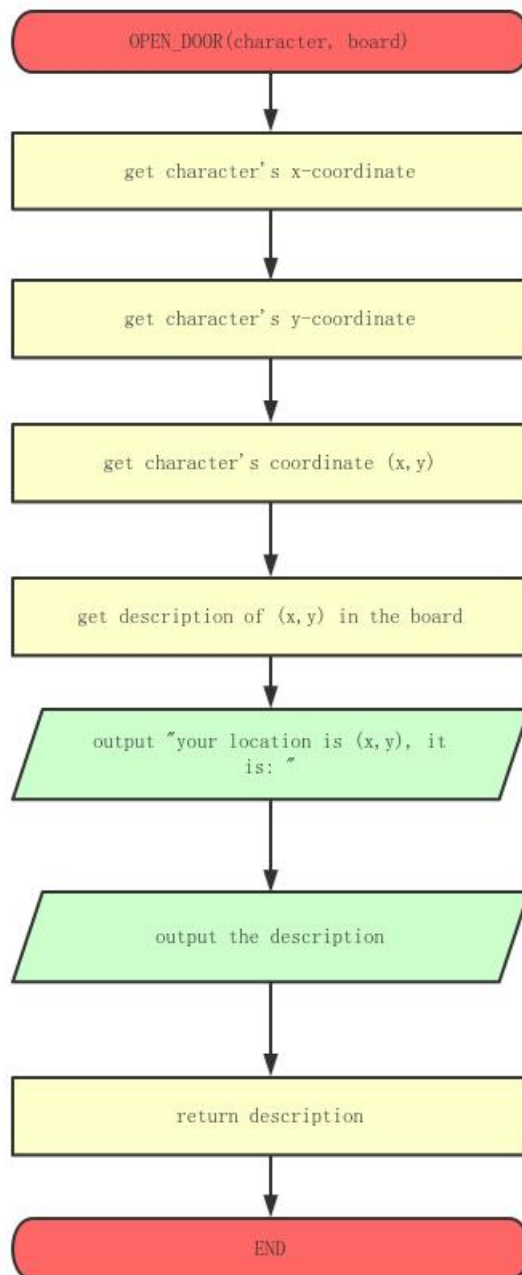
Student Name: Kim Zhang
Student ID: A01374508

Tell If Character Successfully Opened Door

OPEN_DOOR(character)

character's HP -= 1

generate a random integer from 1 to 4 (inclusive)

integer > 1

True

False

output "Door opened"

output "Door is till closed"

character's experience += 1

return character

END
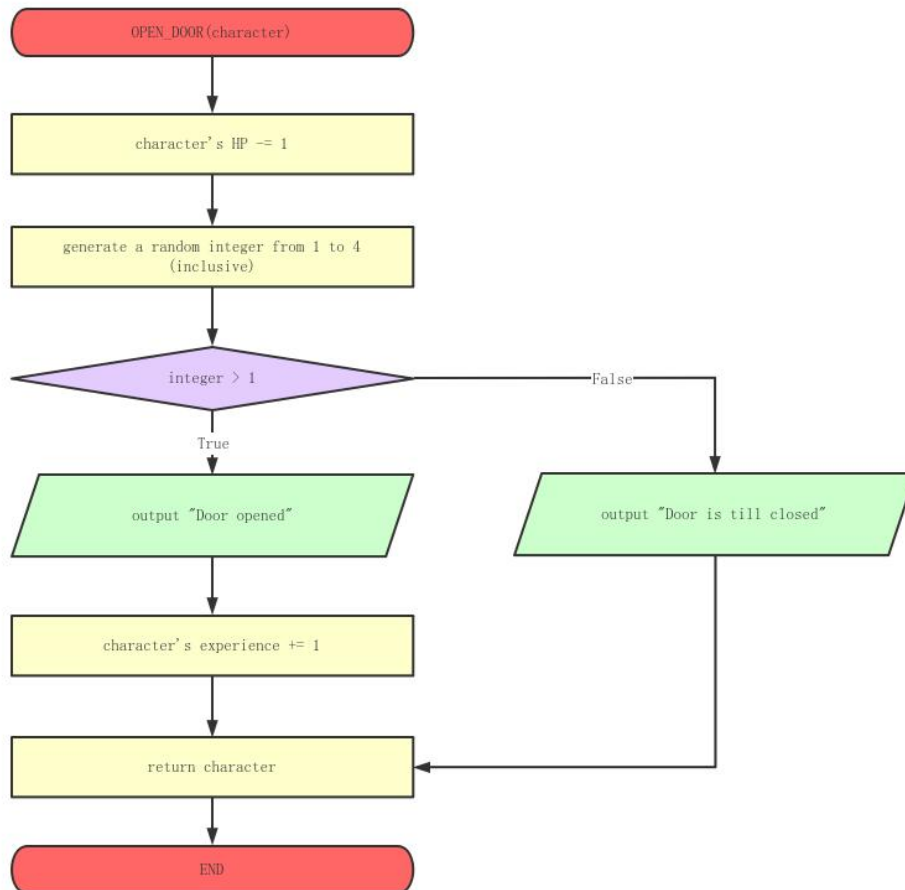
Student Name: Kim Zhang
Student ID: A01374508

Tell If Character Successfully Read Runes

```
                    ╭─────────────────────────╮
                    │   READ_RUNES(character) │
                    ╰─────────────────────────╯
                                 │
                                 ▼
                    ┌─────────────────────────┐
                    │ generate a random integer from 1 to 4 │
                    │        (inclusive)       │
                    └─────────────────────────┘
                                 │
                                 ▼
                    ◇ integer > 1 ◇─────────────False─────────────┐
                                 │                                 │
                               True                                │
                                 ▼                                 ▼
          ╱output "Runes read. You hear the╱      ╱output "You can't read the runes.╱
         ╱ whispers of the stars, speaking of╱   ╱ 'Weird place.' You thought. "   ╱
        ╱ eternal darkness and the endless  ╱   ╱                                 ╱
       ╱             void. "                ╱   ╱                                 ╱
                                 │
                                 ▼
                    ┌─────────────────────────┐
                    │ character's sanity = sanity - 1 │
                    └─────────────────────────┘
                                 │
                                 ▼
                    ┌─────────────────────────┐
                    │ character's experience += 2 │
                    └─────────────────────────┘
                                 │
                                 ▼
                    ┌─────────────────────────┐
                    │     return character    │◄──────────────────┘
                    └─────────────────────────┘
                                 │
                                 ▼
                    ╭─────────────────────────╮
                    │           END           │
                    ╰─────────────────────────╯
```
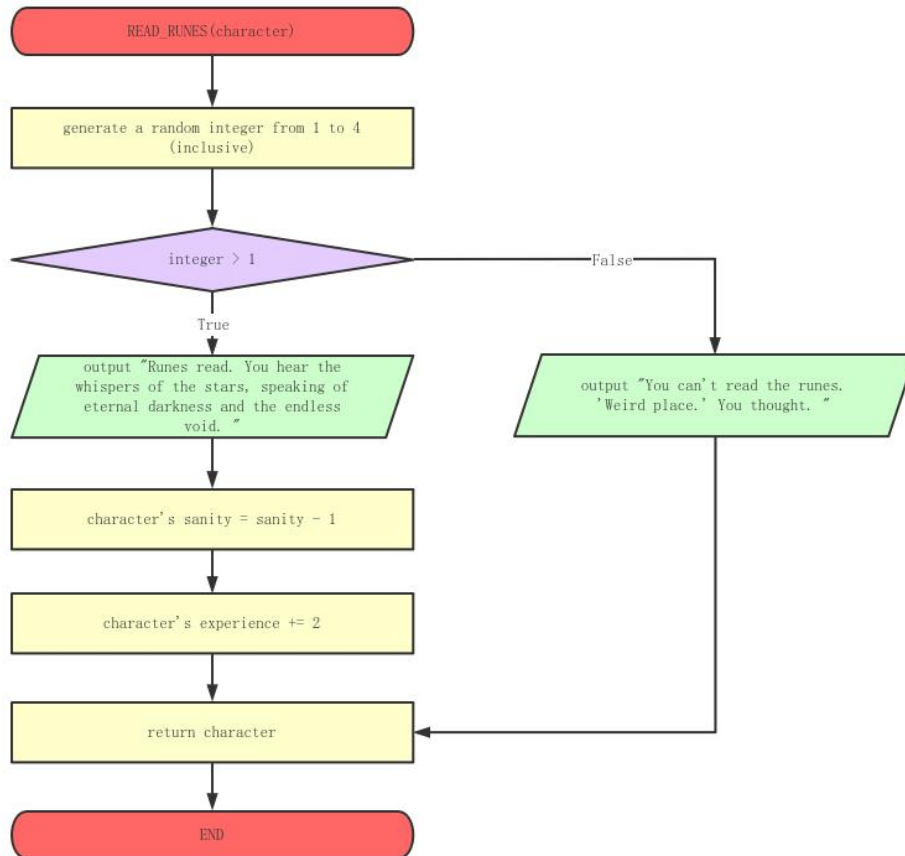
Student Name: Kim Zhang
Student ID: A01374508

Tell If Character Leveled Up

```
        ┌─────────────────────────────────┐
        │   CHECK_LEVEL_UP(character)      │
        └─────────────────────────────────┘
                        │
                        ▼
        ┌─────────────────────────────────┐
        │   get character's experience     │
        └─────────────────────────────────┘
                        │
                        ▼
             ╱─────────────────╲
            ╱  experience >= 10  ╲──────False──────┐
             ╲─────────────────╱                   │
                     │ True                         ▼
                     ▼                   ┌────────────────────┐
        ┌─────────────────────────┐     │    return False    │
        │ character's level = level + 1│  └────────────────────┘
        └─────────────────────────┘                │
                     │                              │
                     ▼                              │
        ╱──────────────────────────╲               │
       ╱  output "One day has passed." ╲            │
        ╲──────────────────────────╱               │
                     │                              │
                     ▼                              │
        ┌─────────────────────────┐                │
        │       return True       │                │
        └─────────────────────────┘                │
                     │                              │
                     ▼                              │
        ┌─────────────────────────┐                │
        │          END            │◄───────────────┘
        └─────────────────────────┘
```
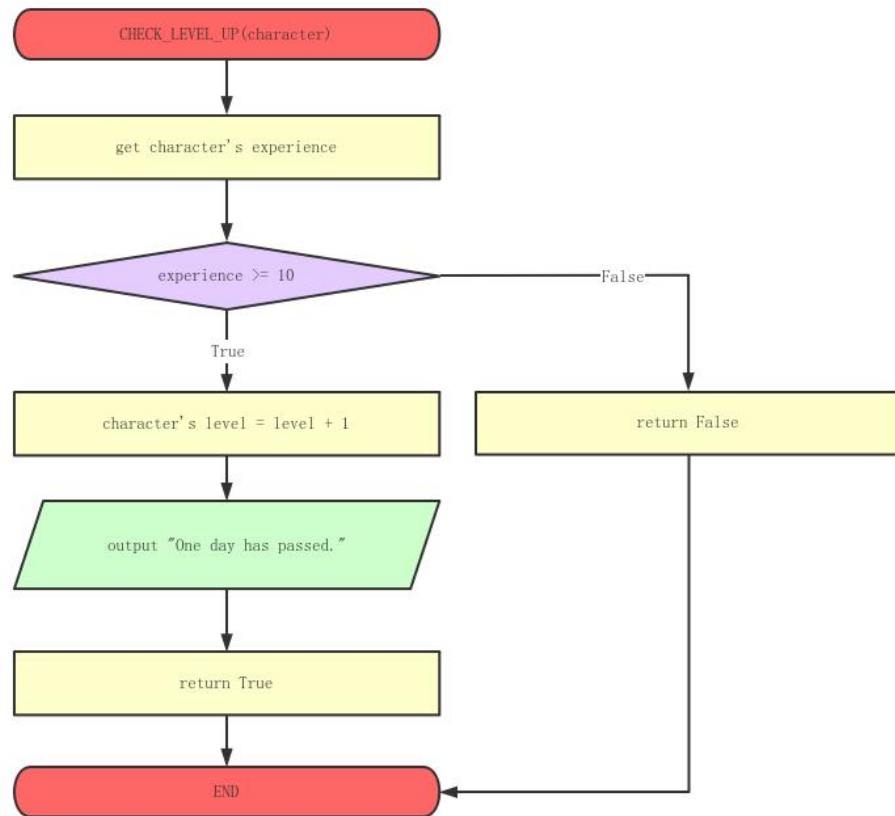
Student Name: Kim Zhang
Student ID: A01374508

Get User's Choice of Direction Flowchart

Student Name: Kim Zhang
Student ID: A01374508

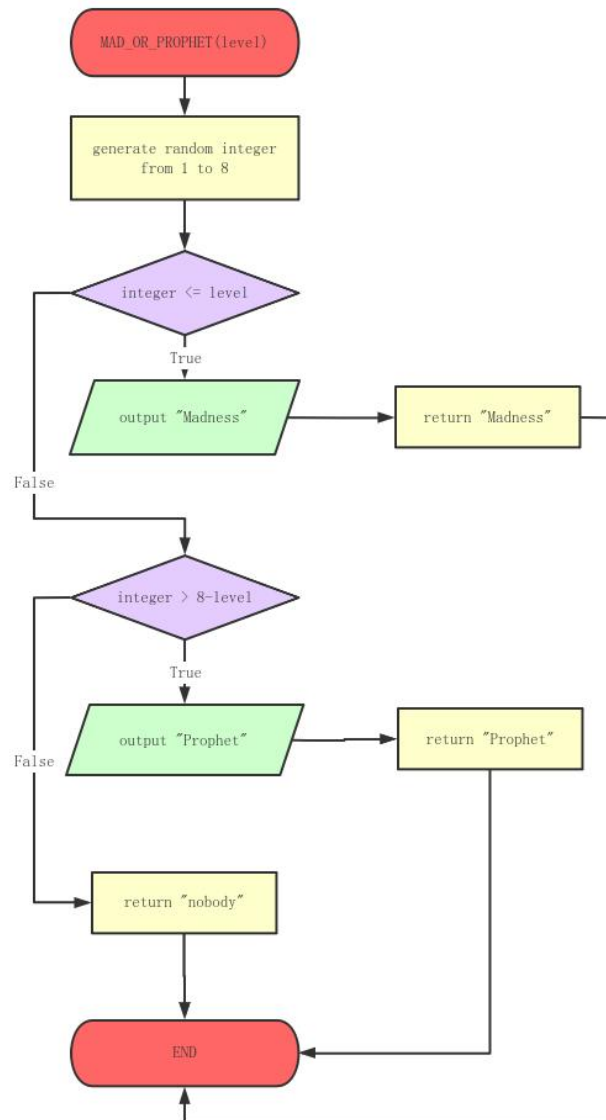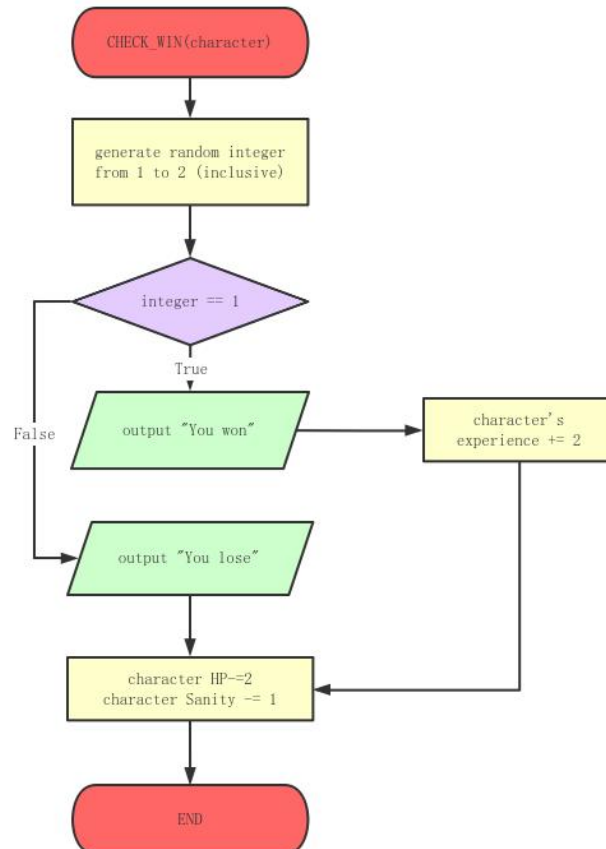Check if User's choice is a
valid move Flowchart

VALIDATE_MOVE
(character, choice)

direction is 1

True

character's
x-coordinate - 1
>= 0

False

False

direction is 2

True

True

character's
x-coordinate + 1
<= 9

True

return True

False

return False

False

direction 3

True

True

character's
y-coordinate - 1
>= 0

False

False

True

character's
y-coordinate - 1
<= 9

False

False

END
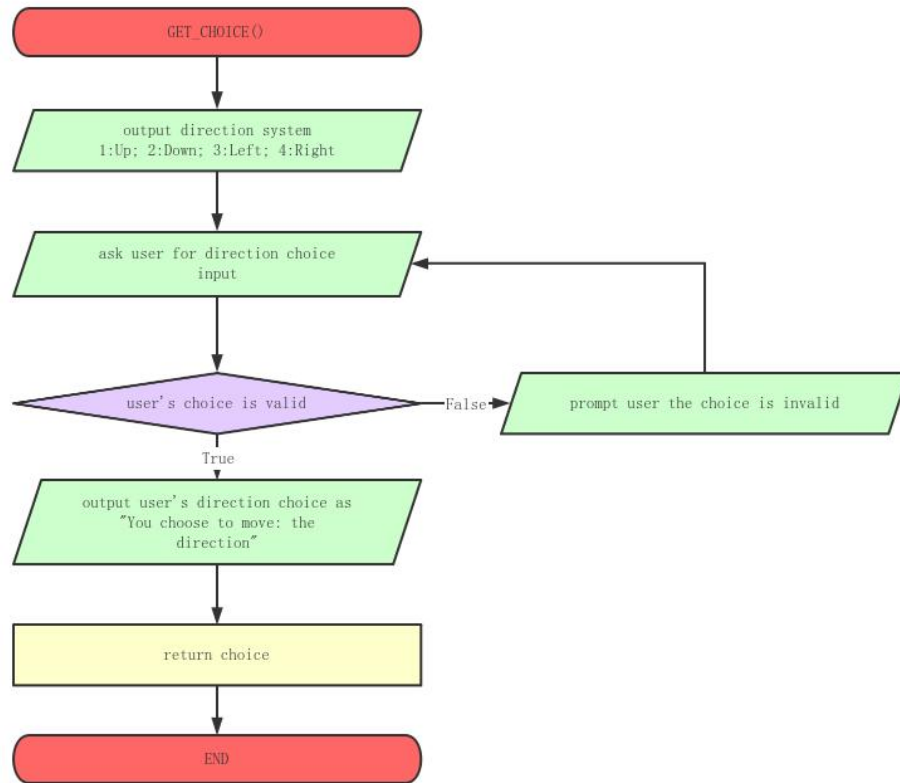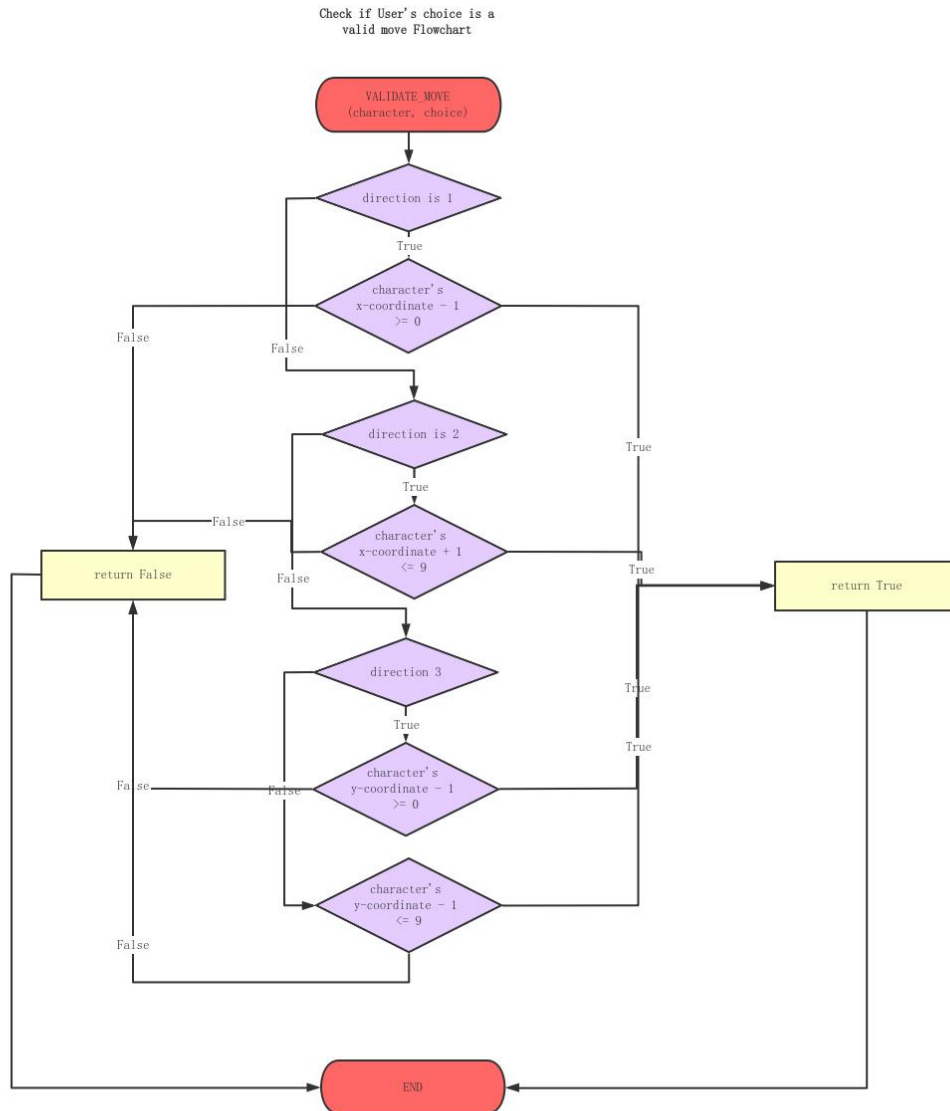
Student Name: Kim Zhang
Student ID: A01374508

Move Character Flowchart
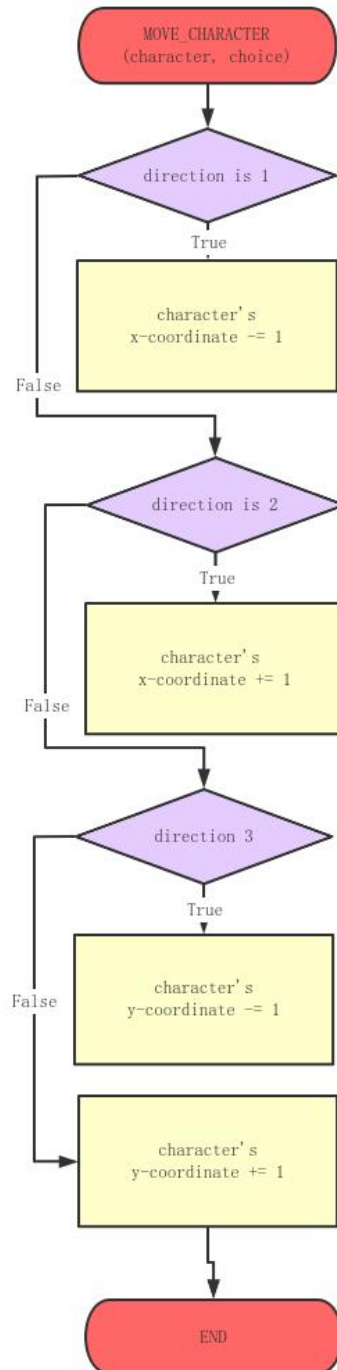
Student Name: Kim Zhang
Student ID: A01374508

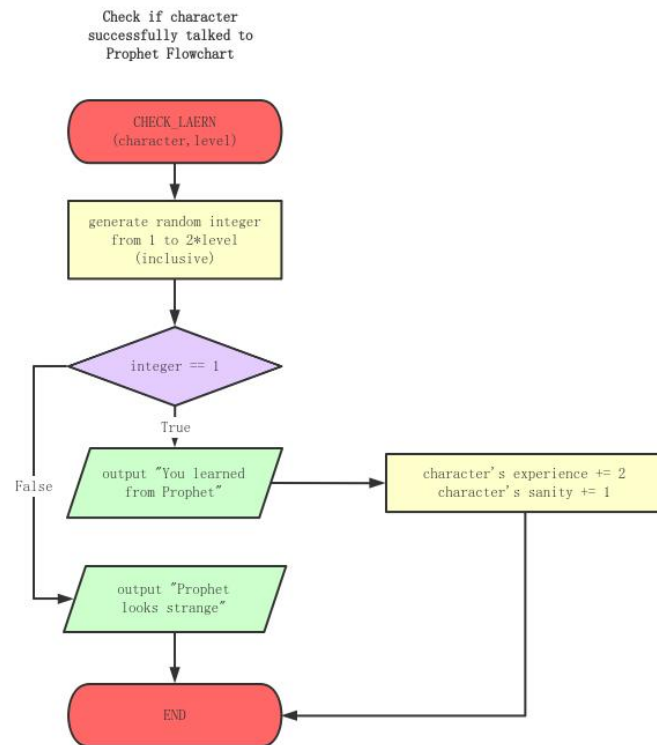Check if encountered madness
or prophet Flowchart

MAD_OR_PROPHET(level)

generate random integer
from 1 to 8

integer <= level

True

output "Madness" → return "Madness"

False

integer > 8-level

True

output "Prophet" → return "Prophet"

False

return "nobody"

END

Student Name: Kim Zhang
Student ID: A01374508

Check if character won
Madness Flowchart

CHECK_WIN(character)

generate random integer
from 1 to 2 (inclusive)

integer == 1

True

False

output "You won"

character's
experience += 2

output "You lose"

character HP-=2
character Sanity -= 1

END

Student Name: Kim Zhang
Student ID: A01374508

Check if character
successfully talked to
Prophet Flowchart

CHECK_LAERN
(character,level)

generate random integer
from 1 to 2*level
(inclusive)

integer == 1

False

True

output "You learned
from Prophet"

character's experience += 2
character's sanity += 1

output "Prophet
looks strange"

END

Student Name: Kim Zhang
Student ID: A01374508

Generate Background Text Flowchart

DECIDE_TEXT()

↓

generate random integer
from 1 to 7 (inclusive)

↓

1. "I hear the whispers of the stars, speaking of eternal darkness and the endless void."
2. "Time is melting before my eyes, reality and dreams entwined, indistinguishable."
3. "IT is calling me, the ancient one from the abyss, I cannot resist ITs voice."
4. "All is in vain, we are but insignificant specks in this cosmos."
5. "I am unsure what is real anymore, or if my mind has been corrupted by the darkness."
6. "Other worlds are calling me, I hear the summons from unknown realms."
7. "Akhamna, Igwatius... these runes echo in my mind, I cannot stop them."

↓

output description
based on the random
integer

↓

END