
Introduction to Software Design

P03. Dragon Realm

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Introduction

- “Dragon Realm”
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 - Source Code
- Code Explanation
 - `def` statements
 - The Colon :
 - Step by Step, One More Time
 - Designing the Program
- Things Covered In This Chapter

“Dragon Realm”

■ Sample Run

```
You are in a land full of dragons. In front of you,  
you see two caves. In one cave, the dragon is friendly  
and will share his treasure with you. The other dragon  
is greedy and hungry, and will eat you on sight.  
Which cave will you go into? (1 or 2)  
1  
You approach the cave...  
It is dark and spooky...  
A large dragon jumps out in front of you! He opens his jaws and...  
Gobbles you down in one bite!  
Do you want to play again? (yes or no)  
no
```

“Dragon Realm”

■ Source Code (1/3)

dragon.py

```
1. import random
2. import time
3.
4. def displayIntro():
5.     print('You are in a land full of dragons. In front of you,')
6.     print('you see two caves. In one cave, the dragon is friendly')
7.     print('and will share his treasure with you. The other dragon')
8.     print('is greedy and hungry, and will eat you on sight.')
9.     print()
10.
11. def chooseCave():
12.     cave = ''
13.     while cave != '1' and cave != '2':
14.         print('Which cave will you go into? (1 or 2)')
15.         cave = input()
16.
17.     return cave
18.
```

“Dragon Realm”

■ Source Code (2/3)

```
19. def checkCave(chosenCave):
20.     print('You approach the cave...')
21.     time.sleep(2)
22.     print('It is dark and spooky...')
23.     time.sleep(2)
24.     print('A large dragon jumps out in front of you! He opens his jaws
and...')
25.     print()
26.     time.sleep(2)
27.
28.     friendlyCave = random.randint(1, 2)
29.
30.     if chosenCave == str(friendlyCave):
31.         print('Gives you his treasure!')
32.     else:
33.         print('Gobbles you down in one bite!')
34.
```

“Dragon Realm”

■ Source Code (3/3)

```
35. playAgain = 'yes'
36. while playAgain == 'yes' or playAgain == 'y':
37.
38.     displayIntro()
39.
40.     caveNumber = chooseCave()
41.
42.     checkCave(caveNumber)
43.
44.     print('Do you want to play again? (yes or no)')
45.     playAgain = input()
```

Code Explanation

■ Two `import` statements.

```
import random  
import time
```

- The **random** module provides random functions. e.g., `random.randint()`.
- The **time** module provides time-related functions.

Code Explanation

■ Defining the `displayIntro()` Function

```
def displayIntro():  
    print('You are in a land full of dragons. In front of you,')  
    print('you see two caves. In one cave, the dragon is friendly')  
    print('and will share his treasure with you. The other dragon')  
    print('is greedy and hungry, and will eat you on sight.')
```

- **def statement**
 - Made up of the **def** keyword, followed by a **function name** with **parentheses**, and then a **colon** (the : sign).
 - There is a block after the statement called the def-block.
- When you *call* this function, the code inside the def-block executes.

Code Explanation

■ `def` statement

The diagram illustrates the components of a Python `def` statement. The code snippet shown is `def chooseCave():`. Annotations with arrows point to specific parts of the code: 'def keyword' points to the word `def`; 'parentheses' points to the empty parentheses `()`; 'function name' points to the identifier `chooseCave`; and 'colon' points to the colon character `:`. The word `def` is highlighted in orange, and `chooseCave` is highlighted in blue.

```
def keyword      parentheses
  ↓              ↓
def chooseCave() :
  ↑              ↑
function name    colon
```

Code Explanation

■ **def** statement

- **Creating** or **defining** a new function.
- When we *call* this function,
 - the code inside the def-block will be executed.
- *c.f.* variables are said to be defined as well.
- **def** statement doesn't execute the code right away
 - It only defines what code is executed, when we call the `displayIntro()` function later in the program.

Code Explanation

■ Defining the chooseCave () Function

- defining another function called chooseCave.

```
def chooseCave () :
```

- Inside the chooseCave () function

```
cave = ''
```

```
while cave != '1' and cave != '2':
```

- It creates a **new variable** called cave and stores a blank string in it.
- then we start a while loop.
 - » which contains a new operator and

Code Explanation

■ Boolean Operators

- **Compare** two Boolean values
- **Evaluate** to a single Boolean value.
 - Boolean expressions are always either **True** or **False**.
- **The and Boolean operator**
 - combines two Boolean values to produce a new Boolean value.

Code Explanation

■ Boolean Operators

- How the `and` operator works:
- If Boolean values on both sides of the `and` keyword are **True**
 - then the expression with the `and` operator **evaluates to True**.
 - `True and True == True`
 - `True and False == False`

Code Explanation

- Evaluating an Expression

```
while cave != '1' and cave != '2':
```

- Two expressions connected by the **and** Boolean operator.
 - We first **evaluate** these expressions to get their Boolean.
 - Then we evaluate the Boolean values with the **and** operator.

Code Explanation

- Evaluating an Expression
 - The steps of how the interpreter evaluates the condition.

```
while cave != '1' and cave != '2':  
    ↓  
while '' != '1' and cave != '2':  
    ↓  
while True and cave != '2':  
    ↓  
while True and '' != '2':  
    ↓  
while True and True:  
    ↓  
while True:
```

The diagram illustrates the step-by-step evaluation of the condition `cave != '1' and cave != '2'` in a `while` loop. It shows how the interpreter evaluates the condition from left to right, substituting the current value of `cave` and the `True` value for the `and` operator. The steps are: 1. `while cave != '1' and cave != '2':`, 2. `while '' != '1' and cave != '2':` (assuming `cave` is an empty string), 3. `while True and cave != '2':` (since `'' != '1'` is `True`), 4. `while True and '' != '2':` (since `cave != '2'` is `True`), 5. `while True and True:` (since both conditions are `True`), and finally 6. `while True:` (since the `and` operation results in `True`).

Code Explanation

- Experimenting with the `and` and `or` Operators

`and` operator

```
>>> True and True
True
>>> True and False
False
>>> False and True
False
>>> False and False
False
```

`or` operator

```
>>> True or True
True
>>> True or False
True
>>> False or True
True
>>> False or False
False
```


Code Explanation

- Experimenting with the `not` Operators

```
>>> not True
False
>>> not False
True
>>> True not 
SyntaxError: invalid syntax
```

- use **both the and and not operators** in a single expression

```
>>> True and not False
True
```

Code Explanation

- Truth Tables
 - The **and** operator's truth table.

A	and	B	is	Entire statement
True	and	True	is	True
True	and	False	is	False
False	and	True	is	False
False	and	False	is	False

Code Explanation

- Truth Tables
 - The **or** operator's truth table.

A or B is	Entire statement
True or True is	True
True or False is	True
False or True is	True
False or False is	False

Code Explanation

- Truth Tables
 - The **not** operator's truth table.

not A		Entire statement
not	True	False
not	False	True

Code Explanation

■ Getting the Player's Input

```
while cave != '1' and cave != '2':  
    print('Which cave will you go into? (1 or 2)')  
    cave = input()
```

- If this condition evaluates to **True**
 - enter the **while-block** again.
- But if the player types in 1 or 2
 - This causes the condition to evaluate to **False**.
 - the program execution continues on **past the while loop**.

Code Explanation

■ Return Values

- **return keyword**

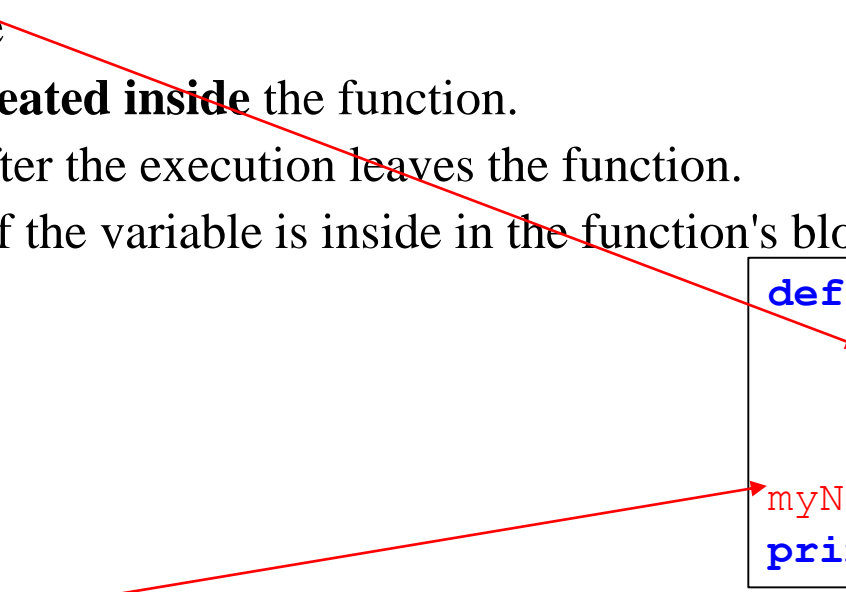
```
return cave
```

- It **returns the string** that is stored in cave.
- It only appears inside def-blocks.
- Once the return statement is executed,
 - » The program execution immediately jumps out of the def-block.
 - » The execution moves back to the line with the function call.

Code Explanation

- Variable Scope
- Local variable
 - Variables **created inside** the function.
 - Forgotten after the execution leaves the function.
 - The scope of the variable is inside in the function's block (local scope).

```
def getName():  
    name = 'Tom'  
    return name  
  
myName = getName()  
print(myName)
```



- Global variable
 - Variables created **outside of all functions** in the program.
 - The scope of variables is the file (module) for which it is defined (global scope)

Code Explanation

- Global variable
 - Use `global` keyword to modify global variables in a function.
 - You **can read** the value of a global variable in a function **without global statement**.
 - But you **cannot write** the value of a global variable in a function **without global statement**.

```
def spam():  
    # global name # comment out this line if you always want to  
    access the variable 'myName' as global variable  
  
    print('Hello, ' + myName)  
  
    myName = 'Tom' # comment out this line if you want to access  
    the global variable 'myName'  
  
    print('Your new name is ' + myName)  
  
myName = 'Bob'  
spam()  
print('Howdy, ' + myName)
```


Code Explanation

- Variable `cave` is defined

```
def chooseCave():  
    cave = ''
```

- It is important to know **when a variable is defined**.
 - because that is how we know the **variable's scope**.
- when the execution left the `chooseCave()` function
 - the `cave` variable was forgotten and destroyed.
 - that is, left `chooseCave()`'s local scope.

Code Explanation

- Defining the `checkCave ()` Function

```
def checkCave(chosenCave):
```

- put the text `chosenCave` in between the parentheses.
- **Parameters:** the variable names in between the parentheses.
- **Arguments:** the actual value of the parameter that gets passed to function.

```
>>> import random
>>> str(5)
'5'
>>> random.randint(1, 20)
9
```

Code Explanation

- Scope example
 - Imagine we had a short program that looked like this.

```
def sayHello(name):  
    print('Hello, ' + name)  
  
print('Say hello to Alice.')  
fizzy = 'Alice'  
sayHello(fizzy)  
print('Do not forget to say hello to  
Bob.')  
sayHello('Bob')
```

```
Say hello to Alice.  
Hello, Alice  
Do not forget to say hello to Bob.  
Hello, Bob
```

Code Explanation

- Scope example
 - Imagine we had a short program that looked like this.

```
def sayHello(name):  
    global fizzy  
    print('Hello, ' + fizzy)  
  
print('Say hello to Alice.')  
fizzy = 'Alice'  
sayHello(fizzy)  
print('Do not forget to say hello to  
Bob.')  
sayHello('Bob')
```

```
Say hello to Alice.  
Hello, Alice  
Do not forget to say hello to Bob.  
Hello, Alice
```

Code Explanation

■ Where to Put Function Definitions

- A function's definition has to come before you call the function.

```
sayGoodBye ()
```

```
def sayGoodBye () :  
    print('Good bye!')
```

```
Traceback (most recent call last):  
  File "<pyshell#3>", line 2, in <module>  
    sayGoodBye()  
NameError: name 'sayGoodBye' is not defined
```

Code Explanation

■ Where to Put Function Definitions

- To fix this, move the function definition before the function call.

```
def sayGoodBye() :  
    print('Good bye!')  
  
sayGoodBye()
```

```
Good bye!
```

Code Explanation

■ Displaying the Game Results

- The `time.sleep()` function

```
print('You approach the cave...')  
time.sleep(2)
```

- The **time** module was imported at the beginning.
- The time module has a function called `sleep()`
 - » pauses the program for 2 seconds.

Code Explanation

■ Displaying the Game Results

- Print some more text and wait again for another 2 seconds.
- These short pauses add suspense to the game.

```
print('It is dark and spooky...')  
time.sleep(2)  
print('A large dragon jumps out in front of you! He opens his jaws and...')  
print()  
time.sleep(2)
```


Code Explanation

■ Deciding Which Cave has the Friendly Dragon

```
friendlyCave = random.randint(1, 2)
```

- **randomly choose** which cave has the friendly dragon in it.
- The `random.randint()` function returns either the integer **1 or 2**.
- This value is stored in a variable called `friendlyCave`.

Code Explanation

■ Deciding Which Cave has the Friendly Dragon

- Check if the **integer 1 or 2** is equal to the cave randomly selected.

```
if chosenCave == str(friendlyCave):  
    print('Gives you his treasure!')
```

- We can't compare strings and integers with the `==` sign.
 - '1' does not equal 1.
 - So we are passing the `friendlyCave` to the `str()` function.
- We could also have done it with the following line instead

```
if int(chosenCave) == friendlyCave:
```

Code Explanation

■ else keyword

```
if chosenCave == str(friendlyCave):  
    print('Gives you his treasure!')  
else:  
    print('Gobbles you down in one bite!')
```

- always comes after the if-block.
- If the condition is true, then execute the if-block or else execute the else-block.
- Remember to put the colon (the : sign) after the else keyword.
- Always place a colon at the end of **if**, **else**, **while**, and **def** statements.

Code Explanation

- `elif` ("Else If") Statements
 - Take a look at the following code.

```
if catName == 'Fuzzball':  
    print('Your cat is fuzzy.')  
else:  
    print('Your cat is not very fuzzy at all.')
```

- If the `catName` variable is equal to the string `'Fuzzball'`
 - then the `if` statement's condition is `True`
 - and we tell the user that her cat is fuzzy.
- If `catName` is anything else
 - then we tell the user her cat is not fuzzy.

Code Explanation

- `elif` ("Else If") Statements
 - We could put another `if` and `else` statement inside the first `else` block like this.

```
if catName == 'Fuzzball':  
    print 'Your cat is fuzzy.'  
else:  
    if catName == 'Spots':  
        print 'Your cat is spotted.'  
    else:  
        print 'Your cat is neither fuzzy nor spotted.'
```

Code Explanation

- `elif` ("Else If") Statements
 - if we wanted more things, then the code starts to have a lot of indentation.

```
if catName == 'Fuzzball':  
    print 'Your cat is fuzzy.'  
else:  
    if catName == 'Spots'  
        print 'Your cat is spotted.'  
    else:  
        if catName == 'FattyKitty'  
            print 'Your cat is fat.'  
        else:  
            if catName == 'Puff'  
                print 'Your cat is puffy.'  
            else:  
                print 'Your cat is neither fuzzy nor spotted  
nor fat nor puffy.'
```

Code Explanation

- `elif` ("Else If") Statements
 - Using `elif`, the above code looks like this.

```
if catName == 'Fuzzball':  
    print 'Your cat is fuzzy.'  
elif catName == 'Spots':  
    print 'Your cat is spotted.'  
elif catName == 'FattyKitty':  
    print 'Your cat is fat.'  
elif catName == 'Puff':  
    print 'Your cat is puffy.'  
else:  
    print 'Your cat is neither fuzzy nor spotted  
nor fat nor puffy.'
```

Code Explanation

■ Where the Main Part Begins

- This line is where our program really begins.

```
playAgain = 'yes'
```

- Here is the beginning of a `while` loop.

```
while playAgain == 'yes' or playAgain == 'y':
```


Code Explanation

■ Calling the Functions

- The execution jumps to the first line in the `displayIntro()` function.

```
displayIntro()
```

- The return value is stored in a new variable named `caveNumber`.

```
caveNumber = chooseCave()
```

- This line calls our `checkCave()` function with the argument `caveNumber`.

```
checkCave(caveNumber)
```

Code Explanation

■ Asking the Player to Play Again

- The variable `playAgain`
 - stores the string that the user typed in.
 - then we reach the end of the while-block
 - so the program re-checks the while statement's condition
(`playAgain == 'yes' or playAgain == 'y'`)

```
print('Do you want to play again? (yes or no) ')\nplayAgain = input()
```

Code Explanation – step by step

```
import random
import time

def displayIntro():
    print 'You are in a land full of dragons. In front of you,'
    print 'you see two caves. In one cave, the dragon is friendly'
    print 'and will share his treasure with you. The other dragon'
    print 'is greedy and hungry, and will eat you on sight.'
    print

def chooseCave():
    cave = ''
    while cave != '1' and cave != '2':
        print 'Which cave will you go into? (1 or 2)'
        cave = raw_input()

    return cave

def checkCave(chosenCave):
    print 'You approach the cave...'
```

Code Explanation – step by step

```
import random
```

```
import time
```

```
def displayIntro():
```

```
    print 'You are in a land full of dragons. In front of you,'
```

```
    print 'you see two caves. In one cave, the dragon is friendly'
```

```
    print 'and will share his treasure with you. The other dragon'
```

```
    print 'is greedy and hungry, and will eat you on sight.'
```

```
    print
```

```
def chooseCave():
```

```
    cave = ''
```

```
    while cave != '1' and cave != '2':
```

```
        print 'Which cave will you go into? (1 or 2)'
```

```
        cave = raw_input()
```

```
    return cave
```

```
def checkCave(chosenCave):
```

```
    print 'You approach the cave...'
```

Code Explanation – step by step

```
import random
import time
```

```
def displayIntro():
    print 'You are in a land full of dragons. In front of you,'
    print 'you see two caves. In one cave, the dragon is friendly'
    print 'and will share his treasure with you. The other dragon'
    print 'is greedy and hungry, and will eat you on sight.'
    print
```

```
def chooseCave():
    cave = ''
    while cave != '1' and cave != '2':
        print 'Which cave will you go into? (1 or 2)'
        cave = raw_input()
```

```
    return cave
```

```
def checkCave(chosenCave):
    print 'You approach the cave...'
```

Code Explanation – step by step

```
import random
import time

def displayIntro():
    print 'You are in a land full of dragons. In front of you,'
    print 'you see two caves. In one cave, the dragon is friendly'
    print 'and will share his treasure with you. The other dragon'
    print 'is greedy and hungry, and will eat you on sight.'
    print

def chooseCave():
    cave = ''
    while cave != '1' and cave != '2':
        print 'Which cave will you go into? (1 or 2)'
        cave = raw_input()

    return cave

def checkCave(chosenCave):
    print 'You approach the cave...'
```

Code Explanation – step by step

```
def checkCave(chosenCave):  
    print 'You approach the cave...'  
    time.sleep(2)  
    print 'It is dark and spooky...'  
    time.sleep(2)  
    print 'A large dragon jumps out in front of you! He opens his jaws and...'  
    print  
    time.sleep(2)  
  
    friendlyCave = random.randint(1, 2)  
  
    if chosenCave == str(friendlyCave):  
        print 'Gives you his treasure!'  
    else:  
        print 'Gobbles you down in one bite!'  
  
playAgain = 'yes'  
while playAgain == 'yes' or playAgain == 'y':
```

Code Explanation – step by step

```
def checkCave(chosenCave):  
    print 'You approach the cave...'  
    time.sleep(2)  
    print 'It is dark and spooky...'  
    time.sleep(2)  
    print 'A large dragon jumps out in front of you! He opens his jaws and...'  
    print  
    time.sleep(2)  
  
    friendlyCave = random.randint(1, 2)  
  
    if chosenCave == str(friendlyCave):  
        print 'Gives you his treasure!'  
    else:  
        print 'Gobbles you down in one bite!'  
  
playAgain = 'yes'  
while playAgain == 'yes' or playAgain == 'y':
```


Code Explanation – step by step

Global Scope

```
playAgain == 'yes'
```

```
playAgain = 'yes'
```

```
while playAgain == 'yes' or playAgain == 'y':
```

```
    displayIntro()
```

```
    caveNumber = chooseCave()
```

```
    checkCave(caveNumber)
```

```
    print 'Do you want to play again? (yes or no)'
```

```
    playAgain = raw_input()
```

Code Explanation – step by step

Global Scope

```
playAgain == 'yes'
```

```
playAgain = 'yes'  
while playAgain == 'yes' or playAgain == 'y':
```

```
    displayIntro()
```

```
    caveNumber = chooseCave()
```

```
    checkCave(caveNumber)
```

```
    print 'Do you want to play again? (yes or no) '  
    playAgain = raw_input()
```

Code Explanation – step by step

```
import random
import time
```

Global Scope

```
playAgain == 'yes'
```

```
def displayIntro():
    print 'You are in a land full of dragons. In front of you,'
    print 'you see two caves. In one cave, the dragon is friendly'
    print 'and will share his treasure with you. The other dragon'
    print 'is greedy and hungry, and will eat you on sight.'
    print

def chooseCave():
    cave = ''
    while cave != '1' and cave != '2':
        print 'Which cave will you go into? (1 or 2)'
        cave = raw_input()

    return cave
```

Code Explanation – step by step

```
import random
import time
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Global Scope

```
playAgain == 'yes'
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```
def displayIntro():
```

```
    print 'You are in a land full of dragons. In front of you,'
    print 'you see two caves. In one cave, the dragon is friendly'
    print 'and will share his treasure with you. The other dragon'
    print 'is greedy and hungry, and will eat you on sight.'
    print
```

```
def chooseCave():
```

```
    cave = ''
    while cave != '1' and cave != '2':
        print 'Which cave will you go into? (1 or 2)'
        cave = raw_input()

    return cave
```

Code Explanation – step by step

```
import random
import time
```

Global Scope

```
playAgain == 'yes'
```

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def displayIntro():
    print 'You are in a land full of dragons. In front of you,'
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    print

def chooseCave():
    cave = ''
    while cave != '1' and cave != '2':
        print 'Which cave will you go into? (1 or 2)'
        cave = raw_input()

    return cave
```

Code Explanation – step by step

```
import random
import time
```

Global Scope

```
playAgain == 'yes'
```

```
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    print 'You are in a land full of dragons. In front of you,'
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    print 'is greedy and hungry, and will eat you on sight.'
    print

def chooseCave():
    cave = ''
    while cave != '1' and cave != '2':
        print 'Which cave will you go into? (1 or 2)'
        cave = raw_input()

    return cave
```

Code Explanation – step by step

```
import random
import time
```

Global Scope

```
playAgain == 'yes'
```

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def displayIntro():
    print 'You are in a land full of dragons. In front of you,'
    print 'you see two caves. In one cave, the dragon is friendly'
    print 'and will share his treasure with you. The other dragon'
    print 'is greedy and hungry, and will eat you on sight.'
    print

def chooseCave():
    cave = ''
    while cave != '1' and cave != '2':
        print 'Which cave will you go into? (1 or 2)'
        cave = raw_input()

    return cave
```

Code Explanation – step by step

```
import random
import time
```

Global Scope

```
playAgain == 'yes'
```

```
def displayIntro():
    print 'You are in a land full of dragons. In front of you,'
    print 'you see two caves. In one cave, the dragon is friendly'
    print 'and will share his treasure with you. The other dragon'
    print 'is greedy and hungry, and will eat you on sight.'
    print
```

```
def chooseCave():
    cave = ''
    while cave != '1' and cave != '2':
        print 'Which cave will you go into? (1 or 2)'
        cave = raw_input()

    return cave
```


Code Explanation – step by step

Global Scope

```
playAgain == 'yes'
```

```
playAgain = 'yes'  
while playAgain == 'yes' or playAgain == 'y':
```

```
    displayIntro()
```

```
    caveNumber = chooseCave()
```

```
    checkCave(caveNumber)
```

```
    print 'Do you want to play again? (yes or no) '  
    playAgain = raw_input()
```

Code Explanation – step by step

Global Scope

```
playAgain == 'yes'
```

```
playAgain = 'yes'
while playAgain == 'yes' or playAgain == 'y':

    displayIntro()

    caveNumber = chooseCave()

    checkCave(caveNumber)

    print 'Do you want to play again? (yes or no)'
    playAgain = raw_input()
```

Code Explanation – step by step

```
import random
import time
```

Global Scope

```
playAgain == 'yes'
```

```
def displayIntro():
    print 'You are in a land full of dragons. In front of you,'
    print 'you see two caves. In one cave, the dragon is friendly'
    print 'and will share his treasure with you. The other dragon'
    print 'is greedy and hungry, and will eat you on sight.'
    print
```

```
def chooseCave():
    cave = ''
    while cave != '1' and cave != '2':
        print 'Which cave will you go into? (1 or 2)'
        cave = raw_input()

    return cave
```

Code Explanation – step by step

```
import random
import time
```

Global Scope

```
playAgain == 'yes'
```

```
def displayIntro():
    print 'You are in a land full of dragons. In front of you,'
    print 'you see two caves. In one cave, the dragon is friendly'
    print 'and will share his treasure with you. The other dragon'
    print 'is greedy and hungry, and will eat you on sight.'
    print

def chooseCave():
    cave = ''
    while cave != '1' and cave != '2':
        print 'Which cave will you go into? (1 or 2)'
        cave = raw_input()

    return cave
```

Code Explanation – step by step

```
import random
import time
```

Global Scope

```
playAgain == 'yes'
```

```
def displayIntro():
    print 'You are in a land full of dragons.'
    print 'you see two caves. In one cave, the'
    print 'and will share his treasure with you. The other dragon'
    print 'is greedy and hungry, and will eat you on sight.'
    print
```

Local Scope

```
cave == ''
```

```
def chooseCave():
    cave = ''
    while cave != '1' and cave != '2':
        print 'Which cave will you go into? (1 or 2)'
        cave = raw_input()

    return cave
```

Code Explanation – step by step

```
import random
import time
```

Global Scope

```
playAgain == 'yes'
```

```
def displayIntro():
    print 'You are in a land full of dragons.'
    print 'you see two caves. In one cave, the'
    print 'and will share his treasure with you. The other dragon'
    print 'is greedy and hungry, and will eat you on sight.'
    print
```

Lobal Scope

```
cave == ''
```

```
def chooseCave():
    cave = ''
    while cave != '1' and cave != '2':
        print 'Which cave will you go into? (1 or 2)'
        cave = raw_input()

    return cave
```

Code Explanation – step by step

```
import random
import time
```

Global Scope

```
playAgain == 'yes'
```

```
def displayIntro():
    print 'You are in a land full of dragons.'
    print 'you see two caves. In one cave, the'
    print 'and will share his treasure with you. The other dragon'
    print 'is greedy and hungry, and will eat you on sight.'
    print
```

Lobal Scope

```
cave == ''
```

```
def chooseCave():
    cave = ''
    while cave != '1' and cave != '2':
        print 'Which cave will you go into? (1 or 2)'
        cave = raw_input()

    return cave
```

Code Explanation – step by step

```
import random
import time
```

Global Scope

```
playAgain == 'yes'
```

```
def displayIntro():
    print 'You are in a land full of dragons.'
    print 'you see two caves. In one cave, the'
    print 'and will share his treasure with you. The other dragon'
    print 'is greedy and hungry, and will eat you on sight.'
    print
```

Lobal Scope

```
cave == '3'
```

```
def chooseCave():
    cave = ''
    while cave != '1' and cave != '2':
        print 'Which cave will you go into? (1 or 2)'
        cave = raw_input()

    return cave
```


Code Explanation – step by step

```
import random
import time
```

Global Scope

```
playAgain == 'yes'
```

```
def displayIntro():
    print 'You are in a land full of dragons.'
    print 'you see two caves. In one cave, the'
    print 'and will share his treasure with you. The other dragon'
    print 'is greedy and hungry, and will eat you on sight.'
    print
```

Lobal Scope

```
cave == '3'
```

```
def chooseCave():
    cave = ''
    while cave != '1' and cave != '2':
        print 'Which cave will you go into? (1 or 2)'
        cave = raw_input()

    return cave
```

Code Explanation – step by step

```
import random
import time
```

Global Scope

```
playAgain == 'yes'
```

```
def displayIntro():
    print 'You are in a land full of dragons.'
    print 'you see two caves. In one cave, the'
    print 'and will share his treasure with you. The other dragon'
    print 'is greedy and hungry, and will eat you on sight.'
    print
```

Lobal Scope

```
cave == '3'
```

```
def chooseCave():
    cave = ''
    while cave != '1' and cave != '2':
        print 'Which cave will you go into? (1 or 2)'
        cave = raw_input()

    return cave
```

Code Explanation – step by step

```
import random
import time
```

Global Scope

```
playAgain == 'yes'
```

```
def displayIntro():
    print 'You are in a land full of dragons.'
    print 'you see two caves. In one cave, the'
    print 'and will share his treasure with you. The other dragon'
    print 'is greedy and hungry, and will eat you on sight.'
    print
```

Lobal Scope

```
cave == '2'
```

```
def chooseCave():
    cave = ''
    while cave != '1' and cave != '2':
        print 'Which cave will you go into? (1 or 2)'
        cave = raw_input()

    return cave
```

Code Explanation – step by step

```
return cave
```

```
def checkCave(chosenCave):  
    print 'You approach the cave...'  
    time.sleep(2)  
    print 'It is dark and spooky...'  
    time.sleep(2)  
    print 'A large dragon jumps out in front of you! He op  
    print  
    time.sleep(2)  
  
    friendlyCave = random.randint(1, 2)  
  
    if chosenCave == str(friendlyCave):  
        print 'Gives you his treasure!'  
    else:  
        print 'Gobbles you down in one bite!'  
  
playAgain = 'yes'  
while playAgain == 'yes' or playAgain == 'y':  
  
    displayIntro()  
  
    caveNumber = chooseCave()  
  
    checkCave(caveNumber)  
  
    print 'Do you want to play again? (yes or no)'
```

Global Scope

```
playAgain == 'yes'
```

Global Scope

```
cave == '2'
```

Code Explanation – step by step

```
    return cave

def checkCave(chosenCave):
    print 'You approach the cave...'
    time.sleep(2)
    print 'It is dark and spooky...'
    time.sleep(2)
    print 'A large dragon jumps out in front of you! He opens his jaws and...'
    print
    time.sleep(2)

    friendlyCave = random.randint(1, 2)

    if chosenCave == str(friendlyCave):
        print 'Gives you his treasure!'
    else:
        print 'Gobbles you down in one bite!'

playAgain = 'yes'
while playAgain == 'yes' or playAgain == 'y':

    displayIntro()

    caveNumber = chooseCave()

    checkCave(caveNumber)

    print 'Do you want to play again? (yes or no)'
```

Global Scope

```
playAgain == 'yes'
```

```
caveNumber == '2'
```

Code Explanation – step by step

```
    return cave

def checkCave(chosenCave):
    print 'You approach the cave...'
    time.sleep(2)
    print 'It is dark and spooky...'
    time.sleep(2)
    print 'A large dragon jumps out in front of you! He opens his jaws and...'
    print
    time.sleep(2)

    friendlyCave = random.randint(1, 2)

    if chosenCave == str(friendlyCave):
        print 'Gives you his treasure!'
    else:
        print 'Gobbles you down in one bite!'

playAgain = 'yes'
while playAgain == 'yes' or playAgain == 'y':

    displayIntro()

    caveNumber = chooseCave()

    checkCave(caveNumber)

    print 'Do you want to play again? (yes or no)'
```

Global Scope

```
playAgain == 'yes'
```

```
caveNumber == '2'
```

Code Explanation – step by step

```
return cave
```

```
def checkCave(chosenCave):
```

```
    print 'You approach the cave...'
```

```
    time.sleep(2)
```

```
    print 'It is dark and spooky...'
```

```
    time.sleep(2)
```

```
    print 'A large dragon jumps out in front of you! He opens his jaws and...'
```

```
    print
```

```
    time.sleep(2)
```

```
friendlyCave = random.randint(1, 2)
```

```
if chosenCave == str(friendlyCave):
```

```
    print 'Gives you his treasure!'
```

```
else:
```

```
    print 'Gobbles you down in one bite!'
```

```
playAgain = 'yes'
```

```
while playAgain == 'yes' or playAgain == 'y':
```

Global Scope

```
playAgain == 'yes'
```

```
caveNumber == '2'
```

Code Explanation – step by step

```
    return cave

def checkCave(chosenCave):
    print 'You approach the cave...'
    time.sleep(2)
    print 'It is dark and spooky...'
    time.sleep(2)
    print 'A large dragon jumps out in front of you! H'
    print
    time.sleep(2)

    friendlyCave = random.randint(1, 2)

    if chosenCave == str(friendlyCave):
        print 'Gives you his treasure!'
    else:
        print 'Gobbles you down in one bite!'

playAgain = 'yes'
while playAgain == 'yes' or playAgain == 'y':
```

Global Scope

```
playAgain == 'yes'
```

```
caveNumber == '2'
```

Local Scope

```
chosenCave == '2'
```


Code Explanation – step by step

```
    return cave

def checkCave(chosenCave):
    print 'You approach the cave...'
    time.sleep(2)
    print 'It is dark and spooky...'
    time.sleep(2)
    print 'A large dragon jumps out in front of you! H'
    print
    time.sleep(2)

    friendlyCave = random.randint(1, 2)

    if chosenCave == str(friendlyCave):
        print 'Gives you his treasure!'
    else:
        print 'Gobbles you down in one bite!'

playAgain = 'yes'
while playAgain == 'yes' or playAgain == 'y':
```

Global Scope

```
playAgain == 'yes'
```

```
caveNumber == '2'
```

Lobal Scope

```
chosenCave == '2'
```

Code Explanation – step by step

```
return cave

def checkCave(chosenCave):
    print 'You approach the cave...'
    time.sleep(2)
    print 'It is dark and spooky...'
    time.sleep(2)
    print 'A large dragon jumps out in front of you! H'
    print
    time.sleep(2)

friendlyCave = random.randint(1, 2)

if chosenCave == str(friendlyCave):
    print 'Gives you his treasure!'
else:
    print 'Gobbles you down in one bite!'

playAgain = 'yes'
while playAgain == 'yes' or playAgain == 'y':
```

Global Scope

playAgain == 'yes'

caveNumber == '2'

Local Scope

chosenCave == '2'

Code Explanation – step by step

```
return cave

def checkCave(chosenCave):
    print 'You approach the cave...'
    time.sleep(2)
    print 'It is dark and spooky...'
    time.sleep(2)
    print 'A large dragon jumps out in front of you! H
    print
    time.sleep(2)

friendlyCave = random.randint(1, 2)

if chosenCave == str(friendlyCave):
    print 'Gives you his treasure!'
else:
    print 'Gobbles you down in one bite!'

playAgain = 'yes'
while playAgain == 'yes' or playAgain == 'y':
```

Global Scope

playAgain == 'yes'

caveNumber == '2'

Local Scope

chosenCave == '2'

Code Explanation – step by step

```
    return cave

def checkCave(chosenCave):
    print 'You approach the cave...'
    time.sleep(2)
    print 'It is dark and spooky...'
    time.sleep(2)
    print 'A large dragon jumps out in front of you! Haha!'
    print
    time.sleep(2)

    friendlyCave = random.randint(1, 2)

    if chosenCave == str(friendlyCave):
        print 'Gives you his treasure!'
    else:
        print 'Gobbles you down in one bite!'

playAgain = 'yes'
while playAgain == 'yes' or playAgain == 'y':
```

Global Scope

```
playAgain == 'yes'
```

```
caveNumber == '2'
```

Local Scope

```
chosenCave == '2'
```

Code Explanation – step by step

```
    return cave

def checkCave(chosenCave):
    print 'You approach the cave...'
    time.sleep(2)
    print 'It is dark and spooky...'
    time.sleep(2)
    print 'A large dragon jumps out in front of you! H
    print
    time.sleep(2)

    friendlyCave = random.randint(1, 2)

    if chosenCave == str(friendlyCave):
        print 'Gives you his treasure!'
    else:
        print 'Gobbles you down in one bite!'

playAgain = 'yes'
while playAgain == 'yes' or playAgain == 'y':
```

Global Scope

```
playAgain == 'yes'
```

```
caveNumber == '2'
```

Local Scope

```
chosenCave == '2'
```

Code Explanation – step by step

```
    return cave

def checkCave(chosenCave):
    print 'You approach the cave...'
    time.sleep(2)
    print 'It is dark and spooky...'
    time.sleep(2)
    print 'A large dragon jumps out in front of you! H'
    print
    time.sleep(2)

friendlyCave = random.randint(1, 2)

if chosenCave == str(friendlyCave):
    print 'Gives you his treasure!'
else:
    print 'Gobbles you down in one bite!'

playAgain = 'yes'
while playAgain == 'yes' or playAgain == 'y':
```

Global Scope

```
playAgain == 'yes'
```

```
caveNumber == '2'
```

Lobal Scope

```
chosenCave == '2'
```

Code Explanation – step by step

```
return cave
```

```
def checkCave(chosenCave):  
    print 'You approach the cave...'  
    time.sleep(2)  
    print 'It is dark and spooky...'  
    time.sleep(2)  
    print 'A large dragon jumps out in front of you! H  
    print  
    time.sleep(2)
```

```
friendlyCave = random.randint(1, 2)
```

```
if chosenCave == str(friendlyCave):  
    print 'Gives you his treasure!'  
else:  
    print 'Gobbles you down in one bite!'
```

```
playAgain = 'yes'  
while playAgain == 'yes' or playAgain == 'y':
```

Global Scope

```
playAgain == 'yes'
```

```
caveNumber == '2'
```

Local Scope

```
chosenCave == '2'
```

Code Explanation – step by step

```
    return cave

def checkCave(chosenCave):
    print 'You approach the cave...'
    time.sleep(2)
    print 'It is dark and spooky...'
    time.sleep(2)
    print 'A large dragon jumps out in front of you! H'
    print
    time.sleep(2)

    friendlyCave = random.randint(1, 2)

    if chosenCave == str(friendlyCave):
        print 'Gives you his treasure!'
    else:
        print 'Gobbles you down in one bite!'

playAgain = 'yes'
while playAgain == 'yes' or playAgain == 'y':
```

Global Scope

```
playAgain == 'yes'
```

```
caveNumber == '2'
```

Lobal Scope

```
chosenCave == '2'
```

```
friendlyCave == 2
```


Code Explanation – step by step

```
    return cave

def checkCave(chosenCave):
    print 'You approach the cave...'
    time.sleep(2)
    print 'It is dark and spooky...'
    time.sleep(2)
    print 'A large dragon jumps out in front of you! H'
    print
    time.sleep(2)

    friendlyCave = random.randint(1, 2)

    if chosenCave == str(friendlyCave):
        print 'Gives you his treasure!'
    else:
        print 'Gobbles you down in one bite!'

playAgain = 'yes'
while playAgain == 'yes' or playAgain == 'y':
```

Global Scope

```
playAgain == 'yes'
```

```
caveNumber == '2'
```

Global Scope

```
chosenCave == '2'
```

```
friendlyCave == 2
```

Code Explanation – step by step

```
friendlyCave = random.randint(1, 2)

if chosenCave == str(friendlyCave):
    print 'Gives you his treasure!'
else:
    print 'Gobbles you down in one bite!'
```

```
playAgain = 'yes'
while playAgain == 'yes' or playAgain == 'y':
```

```
    displayIntro()
```

```
    caveNumber = chooseCave()
```

```
    checkCave(caveNumber)
```

```
    print 'Do you want to play again? (yes or no)'
    playAgain = raw_input()
```

Global Scope

```
playAgain == 'yes'
```

```
caveNumber == '2'
```

Code Explanation – step by step

```
friendlyCave = random.randint(1, 2)

if chosenCave == str(friendlyCave):
    print 'Gives you his treasure!'
else:
    print 'Gobbles you down in one bite!'
```

```
playAgain = 'yes'
while playAgain == 'yes' or playAgain == 'y':
```

```
    displayIntro()
```

```
    caveNumber = chooseCave()
```

```
    checkCave(caveNumber)
```

```
    print 'Do you want to play again? (yes or no)'
    playAgain = raw_input()
```

Global Scope

```
playAgain == 'yes'
```

```
caveNumber == '2'
```

Code Explanation – step by step

```
friendlyCave = random.randint(1, 2)

if chosenCave == str(friendlyCave):
    print 'Gives you his treasure!'
else:
    print 'Gobbles you down in one bite!'
```

```
playAgain = 'yes'
while playAgain == 'yes' or playAgain == 'y':
```

```
    displayIntro()
```

```
    caveNumber = chooseCave()
```

```
    checkCave(caveNumber)
```

```
    print 'Do you want to play again? (yes or no)'
    playAgain = raw_input()
```

Global Scope

```
playAgain == 'y'
```

```
caveNumber == '2'
```

Code Explanation – step by step

```
friendlyCave = random.randint(1, 2)

if chosenCave == str(friendlyCave):
    print 'Gives you his treasure!'
else:
    print 'Gobbles you down in one bite!'
```

```
playAgain = 'yes'
while playAgain == 'yes' or playAgain == 'y':
```

```
    displayIntro()
```

```
    caveNumber = chooseCave()
```

```
    checkCave(caveNumber)
```

```
    print 'Do you want to play again? (yes or no)'
    playAgain = raw_input()
```

Global Scope

```
playAgain == 'y'
```

```
caveNumber == '2'
```

Code Explanation – step by step

```
friendlyCave = random.randint(1, 2)

if chosenCave == str(friendlyCave):
    print 'Gives you his treasure!'
else:
    print 'Gobbles you down in one bite!'
```

```
playAgain = 'yes'
while playAgain == 'yes' or playAgain == 'y':
```

```
    displayIntro()
```

```
    caveNumber = chooseCave()
```

```
    checkCave(caveNumber)
```

```
    print 'Do you want to play again? (yes or no)'
    playAgain = raw_input()
```

Global Scope

```
playAgain == 'y'
```

```
caveNumber == '2'
```

Code Explanation – step by step

```
import random
import time
```

Global Scope

```
playAgain == 'y'
```

```
caveNumber == '2'
```

```
def displayIntro():
```

```
    print 'You are in a land full of dragons. In front of you,'
    print 'you see two caves. In one cave, the dragon is friendly'
    print 'and will share his treasure with you. The other dragon'
    print 'is greedy and hungry, and will eat you on sight.'
    print
```

```
def chooseCave():
```

```
    cave = ''
```

```
    while cave != '1' and cave != '2':
```

```
        print 'Which cave will you go into? (1 or 2)'
```

```
        cave = raw_input()
```

```
    return cave
```

Code Explanation – step by step

```
import random
import time
```

Global Scope

```
playAgain == 'y'
```

```
caveNumber == '2'
```

```
def displayIntro():
```

```
    print 'You are in a land full of dragons. In front of you,'
    print 'you see two caves. In one cave, the dragon is friendly'
    print 'and will share his treasure with you. The other dragon'
    print 'is greedy and hungry, and will eat you on sight.'
    print
```

```
def chooseCave():
```

```
    cave = ''
    while cave != '1' and cave != '2':
        print 'Which cave will you go into? (1 or 2)'
        cave = raw_input()

    return cave
```


Code Explanation – step by step

```
import random
import time
```

```
def displayIntro():
```

```
    print 'You are in a land full of dragons. In front of you,'
    print 'you see two caves. In one cave, the dragon is friendly'
    print 'and will share his treasure with you. The other dragon'
    print 'is greedy and hungry, and will eat you on sight.'
    print
```

```
def chooseCave():
```

```
    cave = ''
    while cave != '1' and cave != '2':
        print 'Which cave will you go into? (1 or 2)'
        cave = raw_input()

    return cave
```

Global Scope

```
playAgain == 'y'
```

```
caveNumber == '2'
```

Code Explanation – step by step

```
import random
import time
```

```
def displayIntro():
```

```
    print 'You are in a land full of dragons. In front of you,'
    print 'you see two caves. In one cave, the dragon is friendly'
    print 'and will share his treasure with you. The other dragon'
    print 'is greedy and hungry, and will eat you on sight.'
    print
```

```
def chooseCave():
```

```
    cave = ''
    while cave != '1' and cave != '2':
        print 'Which cave will you go into? (1 or 2)'
        cave = raw_input()

    return cave
```

Global Scope

```
playAgain == 'y'
```

```
caveNumber == '2'
```

Code Explanation – step by step

```
import random
import time
```

```
def displayIntro():
```

```
    print 'You are in a land full of dragons. In front of you,'
    print 'you see two caves. In one cave, the dragon is friendly'
    print 'and will share his treasure with you. The other dragon'
    print 'is greedy and hungry, and will eat you on sight.'
    print
```

```
def chooseCave():
```

```
    cave = ''
    while cave != '1' and cave != '2':
        print 'Which cave will you go into? (1 or 2)'
        cave = raw_input()

    return cave
```

Global Scope

```
playAgain == 'y'
```

```
caveNumber == '2'
```

Code Explanation – step by step

```
print 'is greedy and hungry, and will eat you on sight.'
print

def chooseCave():
    cave = ''
    while cave != '1' and cave != '2':
        print 'Which cave will you go into? (1 or 2)'
        cave = raw_input()

    return cave

def checkCave(chosenCave):
    print 'You approach the cave...'
    time.sleep(2)
    print 'It is dark and spooky...'
    time.sleep(2)
    print 'A large dragon jumps out in front of you! He opens his jaws and...'
    print
    time.sleep(2)

    friendlyCave = random.randint(1, 2)

    if chosenCave == str(friendlyCave):
        print 'Gives you his treasure!'
    else:
        print 'Gobbles you down in one bite!'

playAgain = 'yes'
while playAgain == 'yes' or playAgain == 'y':

    displayIntro()

    caveNumber = chooseCave()

    checkCave(caveNumber)
```

Global Scope

```
playAgain == 'y'
```

```
caveNumber == '2'
```

Code Explanation – step by step

```
print 'is greedy and hungry, and will eat you on sight.'
print

def chooseCave():
    cave = ''
    while cave != '1' and cave != '2':
        print 'Which cave will you go into? (1 or 2)'
        cave = raw_input()

    return cave

def checkCave(chosenCave):
    print 'You approach the cave...'
    time.sleep(2)
    print 'It is dark and spooky...'
    time.sleep(2)
    print 'A large dragon jumps out in front of you! He opens his jaws and...'
    print
    time.sleep(2)

    friendlyCave = random.randint(1, 2)

    if chosenCave == str(friendlyCave):
        print 'Gives you his treasure!'
    else:
        print 'Gobbles you down in one bite!'

playAgain = 'yes'
while playAgain == 'yes' or playAgain == 'y':

    displayIntro()

    caveNumber = chooseCave()

    checkCave(caveNumber)
```

Global Scope

```
playAgain == 'y'
```

```
caveNumber == '2'
```

Code Explanation – step by step

```
print 'is greedy and hungry, and will eat you on sight.'
print

def chooseCave():
    cave = ''
    while cave != '1' and cave != '2':
        print 'Which cave will you go into? (1 or 2)'
        cave = raw_input()

    return cave

def checkCave(chosenCave):
    print 'You approach the cave...'
    time.sleep(2)
    print 'It is dark and spooky...'
    time.sleep(2)
    print 'A large dragon jumps out in front of you! He opens his jaws and...'
    print
    time.sleep(2)

    friendlyCave = random.randint(1, 2)

    if chosenCave == str(friendlyCave):
        print 'Gives you his treasure!'
    else:
        print 'Gobbles you down in one bite!'

playAgain = 'yes'
while playAgain == 'yes' or playAgain == 'y':

    displayIntro()

    caveNumber = chooseCave()

    checkCave(caveNumber)
```

Global Scope

```
playAgain == 'y'
```

```
caveNumber == '2'
```

Code Explanation – step by step

```
def chooseCave() :  
    cave = ''  
    while cave != '1' and cave != '2':  
        print 'Which cave will you go into? (1 or 2)'  
        cave = raw_input()  
  
    return cave
```

```
def checkCave(chosenCave) :  
    print 'You approach the cave...'  
    time.sleep(2)  
    print 'It is dark and spooky...'  
    time.sleep(2)  
    print 'A large dragon jumps out in front of you! He opens his jaws and...'  
    print  
    time.sleep(2)  
  
    friendlyCave = random.randint(1, 2)  
  
    if chosenCave == str(friendlyCave):  
        print 'Gives you his treasure!'  
    else:  
        print 'Gobbles you down in one bite!'
```

Global Scope

playAgain == 'y'

caveNumber == '2'

Code Explanation – step by step

```
def chooseCave():  
    cave = ''  
    while cave != '1' and cave != '2':  
        print 'Which cave will you go into? (1 or 2)'  
        cave = raw_input()  
  
    return cave
```

```
def checkCave(chosenCave):  
    print 'You approach the cave...'  
    time.sleep(2)  
    print 'It is dark and spooky...'  
    time.sleep(2)  
    print 'A large dragon jumps out in front of you! He opens his jaws and...'  
    print  
    time.sleep(2)  
  
    friendlyCave = random.randint(1, 2)  
  
    if chosenCave == str(friendlyCave):  
        print 'Gives you his treasure!'  
    else:  
        print 'Gobbles you down in one bite!'
```

Global Scope

```
playAgain == 'y'
```

```
caveNumber == '2'
```


Code Explanation – step by step

```
def chooseCave():
    cave = ''
    while cave != '1' and cave != '2':
        print 'Which cave will you go into? (1 or 2)'
        cave = raw_input()

    return cave

def checkCave(chosenCave):
    print 'You approach the cave...'
    time.sleep(2)
    print 'It is dark and spooky...'
    time.sleep(2)
    print 'A large dragon jumps out in front of you! He opens his jaws and...'
    print
    time.sleep(2)

    friendlyCave = random.randint(1, 2)

    if chosenCave == str(friendlyCave):
        print 'Gives you his treasure!'
    else:
        print 'Gobbles you down in one bite!'
```

Global Scope

playAgain == 'y'

caveNumber == '2'

Local Scope

cave == ''

Code Explanation – step by step

```
def chooseCave():
    cave = ''
    while cave != '1' and cave != '2':
        print 'Which cave will you go into? (1 or 2)'
        cave = raw_input()

    return cave

def checkCave(chosenCave):
    print 'You approach the cave...'
    time.sleep(2)
    print 'It is dark and spooky...'
    time.sleep(2)
    print 'A large dragon jumps out in front of you! He opens his jaws and...'
    print
    time.sleep(2)

    friendlyCave = random.randint(1, 2)

    if chosenCave == str(friendlyCave):
        print 'Gives you his treasure!'
    else:
        print 'Gobbles you down in one bite!'
```

Global Scope

```
playAgain == 'y'
caveNumber == '2'
```

Local Scope

```
cave == ''
```

Code Explanation – step by step

```
def chooseCave():  
    cave = ''  
    while cave != '1' and cave != '2':  
        print 'Which cave will you go into? (1 or 2)'  
        cave = raw_input()
```

```
    return cave
```

```
def checkCave(chosenCave):  
    print 'You approach the cave...'  
    time.sleep(2)  
    print 'It is dark and spooky...'  
    time.sleep(2)  
    print 'A large dragon jumps out in front of you! He opens his jaws and...'  
    print  
    time.sleep(2)  
  
    friendlyCave = random.randint(1, 2)  
  
    if chosenCave == str(friendlyCave):  
        print 'Gives you his treasure!'  
    else:  
        print 'Gobbles you down in one bite!'
```

Global Scope

```
playAgain == 'y'
```

```
caveNumber == '2'
```

Global Scope

```
cave == ''
```

Code Explanation – step by step

```
def chooseCave():
    cave = ''
    while cave != '1' and cave != '2':
        print 'Which cave will you go into? (1 or 2)'
        cave = raw_input()

    return cave

def checkCave(chosenCave):
    print 'You approach the cave...'
    time.sleep(2)
    print 'It is dark and spooky...'
    time.sleep(2)
    print 'A large dragon jumps out in front of you! He opens his jaws and...'
    print
    time.sleep(2)

    friendlyCave = random.randint(1, 2)

    if chosenCave == str(friendlyCave):
        print 'Gives you his treasure!'
    else:
        print 'Gobbles you down in one bite!'
```

Global Scope

playAgain == 'y'

caveNumber == '2'

Local Scope

cave == '1'

Code Explanation – step by step

```
return cave
```

```
def checkCave(chosenCave):  
    print 'You approach the cave...'  
    time.sleep(2)  
    print 'It is dark and spooky...'  
    time.sleep(2)  
    print 'A large dragon jumps out in front of you! He opens his jaws and...'  
    print  
    time.sleep(2)  
  
    friendlyCave = random.randint(1, 2)  
  
    if chosenCave == str(friendlyCave):  
        print 'Gives you his treasure!'  
    else:  
        print 'Gobbles you down in one bite!'  
  
playAgain = 'yes'  
while playAgain == 'yes' or playAgain == 'y':  
  
    displayIntro()  
  
    caveNumber = chooseCave()  
  
    checkCave(caveNumber)  
  
    print 'Do you want to play again? (yes or no)'  
    playAgain = raw_input()
```

Global Scope

```
playAgain == 'y'
```

```
caveNumber == '2'
```

Local Scope

```
cave == '1'
```

Code Explanation – step by step

```
return cave
```

```
def checkCave(chosenCave):  
    print 'You approach the cave...'  
    time.sleep(2)  
    print 'It is dark and spooky...'  
    time.sleep(2)  
    print 'A large dragon jumps out in front of you! He opens his jaws and...'  
    print  
    time.sleep(2)
```

```
friendlyCave = random.randint(1, 2)
```

```
if chosenCave == str(friendlyCave):  
    print 'Gives you his treasure!'  
else:  
    print 'Gobbles you down in one bite!'
```

```
playAgain = 'yes'  
while playAgain == 'yes' or playAgain == 'y':
```

```
    displayIntro()
```

```
    caveNumber = chooseCave()
```

```
    checkCave(caveNumber)
```

```
    print 'Do you want to play again? (yes or no)'  
    playAgain = raw_input()
```

Global Scope

```
playAgain == 'y'
```

```
caveNumber == '1'
```

Code Explanation – step by step

```
    return cave

def checkCave(chosenCave):
    print 'You approach the cave...'
    time.sleep(2)
    print 'It is dark and spooky...'
    time.sleep(2)
    print 'A large dragon jumps out in front of you! He opens his jaws and...'
    print
    time.sleep(2)

    friendlyCave = random.randint(1, 2)

    if chosenCave == str(friendlyCave):
        print 'Gives you his treasure!'
    else:
        print 'Gobbles you down in one bite!'

playAgain = 'yes'
while playAgain == 'yes' or playAgain == 'y':

    displayIntro()

    caveNumber = chooseCave()

    checkCave(caveNumber)

    print 'Do you want to play again? (yes or no)'
    playAgain = raw_input()
```

Global Scope

```
playAgain == 'y'
```

```
caveNumber == '1'
```

Code Explanation – step by step

```
return cave
```

```
def checkCave(chosenCave):
```

```
    print 'You approach the cave...'
```

```
    time.sleep(2)
```

```
    print 'It is dark and spooky...'
```

```
    time.sleep(2)
```

```
    print 'A large dragon jumps out in front of you! He opens his jaws and...'
```

```
    print
```

```
    time.sleep(2)
```

```
    friendlyCave = random.randint(1, 2)
```

```
    if chosenCave == str(friendlyCave):
```

```
        print 'Gives you his treasure!'
```

```
    else:
```

```
        print 'Gobbles you down in one bite!'
```

```
playAgain = 'yes'
```

```
while playAgain == 'yes' or playAgain == 'y':
```

```
    displayIntro()
```

```
    caveNumber = chooseCave()
```

```
    checkCave(caveNumber)
```

```
    print 'Do you want to play again? (yes or no)'
```

```
    playAgain = raw_input()
```

Global Scope

```
playAgain == 'y'
```

```
caveNumber == '1'
```


Code Explanation – step by step

```
    return cave

def checkCave(chosenCave):
    print 'You approach the cave...'
    time.sleep(2)
    print 'It is dark and spooky...'
    time.sleep(2)
    print 'A large dragon jumps out in front of you! He opens his jaws and...'
    print
    time.sleep(2)

    friendlyCave = random.randint(1, 2)

    if chosenCave == str(friendlyCave):
        print 'Gives you his treasure!'
    else:
        print 'Gobbles you down in one bite!'

playAgain = 'yes'
while playAgain == 'yes' or playAgain == 'y':

    displayIntro()

    caveNumber = chooseCave()

    checkCave(caveNumber)

    print 'Do you want to play again? (yes or no)'
    playAgain = raw_input()
```

Global Scope

```
playAgain == 'y'
```

```
caveNumber == '1'
```

Global Scope

```
chosenCave == '1'
```

Code Explanation – step by step

```
    return cave

def checkCave(chosenCave):
    print 'You approach the cave...'
    time.sleep(2)
    print 'It is dark and spooky...'
    time.sleep(2)
    print 'A large dragon jumps out in front of you! He opens his jaws and...'
    print
    time.sleep(2)

    friendlyCave = random.randint(1, 2)

    if chosenCave == str(friendlyCave):
        print 'Gives you his treasure!'
    else:
        print 'Gobbles you down in one bite!'

playAgain = 'yes'
while playAgain == 'yes' or playAgain == 'y':

    displayIntro()

    caveNumber = chooseCave()

    checkCave(caveNumber)

    print 'Do you want to play again? (yes or no)'
    playAgain = raw_input()
```

Global Scope

```
playAgain == 'y'
```

```
caveNumber == '1'
```

Local Scope

```
chosenCave == '1'
```

Code Explanation – step by step

```
    return cave

def checkCave(chosenCave):
    print 'You approach the cave...'
    time.sleep(2)
    print 'It is dark and spooky...'
    time.sleep(2)
    print 'A large dragon jumps out in front of you! He opens his jaws and...'
    print
    time.sleep(2)

    friendlyCave = random.randint(1, 2)

    if chosenCave == str(friendlyCave):
        print 'Gives you his treasure!'
    else:
        print 'Gobbles you down in one bite!'

playAgain = 'yes'
while playAgain == 'yes' or playAgain == 'y':

    displayIntro()

    caveNumber = chooseCave()

    checkCave(caveNumber)

    print 'Do you want to play again? (yes or no)'
    playAgain = raw_input()
```

Global Scope

```
playAgain == 'y'
```

```
caveNumber == '1'
```

Global Scope

```
chosenCave == '1'
```

Code Explanation – step by step

```
    return cave

def checkCave(chosenCave):
    print 'You approach the cave...'
    time.sleep(2)
    print 'It is dark and spooky...'
    time.sleep(2)
    print 'A large dragon jumps out in front of you! He opens his jaws and...'
    print
    time.sleep(2)

    friendlyCave = random.randint(1, 2)

    if chosenCave == str(friendlyCave):
        print 'Gives you his treasure!'
    else:
        print 'Gobbles you down in one bite!'

playAgain = 'yes'
while playAgain == 'yes' or playAgain == 'y':

    displayIntro()

    caveNumber = chooseCave()

    checkCave(caveNumber)

    print 'Do you want to play again? (yes or no)'
    playAgain = raw_input()
```

Global Scope

```
playAgain == 'y'
```

```
caveNumber == '1'
```

Local Scope

```
chosenCave == '1'
```

Code Explanation – step by step

```
    return cave

def checkCave(chosenCave):
    print 'You approach the cave...'
    time.sleep(2)
    print 'It is dark and spooky...'
    time.sleep(2)
    print 'A large dragon jumps out in front of you! He opens his jaws and...'
    print
    time.sleep(2)

    friendlyCave = random.randint(1, 2)

    if chosenCave == str(friendlyCave):
        print 'Gives you his treasure!'
    else:
        print 'Gobbles you down in one bite!'

playAgain = 'yes'
while playAgain == 'yes' or playAgain == 'y':

    displayIntro()

    caveNumber = chooseCave()

    checkCave(caveNumber)

    print 'Do you want to play again? (yes or no)'
    playAgain = raw_input()
```

Global Scope

```
playAgain == 'y'
```

```
caveNumber == '1'
```

Local Scope

```
chosenCave == '1'
```

Code Explanation – step by step

```
    return cave

def checkCave(chosenCave):
    print 'You approach the cave...'
    time.sleep(2)
    print 'It is dark and spooky...'
    time.sleep(2)
    print 'A large dragon jumps out in front of you! He opens his jaws and...'
    print
    time.sleep(2)

    friendlyCave = random.randint(1, 2)

    if chosenCave == str(friendlyCave):
        print 'Gives you his treasure!'
    else:
        print 'Gobbles you down in one bite!'

playAgain = 'yes'
while playAgain == 'yes' or playAgain == 'y':

    displayIntro()

    caveNumber = chooseCave()

    checkCave(caveNumber)

    print 'Do you want to play again? (yes or no)'
    playAgain = raw_input()
```

Global Scope

```
playAgain == 'y'
```

```
caveNumber == '1'
```

Global Scope

```
chosenCave == '1'
```

Code Explanation – step by step

```
    return cave

def checkCave(chosenCave):
    print 'You approach the cave...'
    time.sleep(2)
    print 'It is dark and spooky...'
    time.sleep(2)
    print 'A large dragon jumps out in front of you! He opens his jaws and...'
    print
    time.sleep(2)

friendlyCave = random.randint(1, 2)

if chosenCave == str(friendlyCave):
    print 'Gives you his treasure!'
else:
    print 'Gobbles you down in one bite!'

playAgain = 'yes'
while playAgain == 'yes' or playAgain == 'y':

    displayIntro()

    caveNumber = chooseCave()

    checkCave(caveNumber)

    print 'Do you want to play again? (yes or no)'
    playAgain = raw_input()
```

Global Scope

```
playAgain == 'y'
```

```
caveNumber == '1'
```

Global Scope

```
chosenCave == '1'
```

Code Explanation – step by step

```
    return cave

def checkCave(chosenCave):
    print 'You approach the cave...'
    time.sleep(2)
    print 'It is dark and spooky...'
    time.sleep(2)
    print 'A large dragon jumps out in front of you! He opens his jaws and...'
    print
    time.sleep(2)

friendlyCave = random.randint(1, 2)

if chosenCave == str(friendlyCave):
    print 'Gives you his treasure!'
else:
    print 'Gobbles you down in one bite!'

playAgain = 'yes'
while playAgain == 'yes' or playAgain == 'y':

    displayIntro()

    caveNumber = chooseCave()

    checkCave(caveNumber)

    print 'Do you want to play again? (yes or no)'
    playAgain = raw_input()
```

Global Scope

```
playAgain == 'y'
```

```
caveNumber == '1'
```

Global Scope

```
chosenCave == '1'
```


Code Explanation – step by step

```
    return cave

def checkCave(chosenCave):
    print 'You approach the cave...'
    time.sleep(2)
    print 'It is dark and spooky...'
    time.sleep(2)
    print 'A large dragon jumps out in front of you! He opens his jaws and...'
    print
    time.sleep(2)

    friendlyCave = random.randint(1, 2)

    if chosenCave == str(friendlyCave):
        print 'Gives you his treasure!'
    else:
        print 'Gobbles you down in one bite!'

playAgain = 'yes'
while playAgain == 'yes' or playAgain == 'y':

    displayIntro()

    caveNumber = chooseCave()

    checkCave(caveNumber)

    print 'Do you want to play again? (yes or no)'
    playAgain = raw_input()
```

Global Scope

```
playAgain == 'y'
```

```
caveNumber == '1'
```

Local Scope

```
chosenCave == '1'
```

```
friendlyCave == 2
```

Code Explanation – step by step

```
return cave
```

```
def checkCave(chosenCave):  
    print 'You approach the cave...'  
    time.sleep(2)  
    print 'It is dark and spooky...'  
    time.sleep(2)  
    print 'A large dragon jumps out in front of you! He opens his jaws and...'  
    print  
    time.sleep(2)  
  
    friendlyCave = random.randint(1, 2)  
  
    if chosenCave == str(friendlyCave):  
        print 'Gives you his treasure!'  
    else:  
        print 'Gobbles you down in one bite!'
```

```
playAgain = 'yes'  
while playAgain == 'yes' or playAgain == 'y':  
  
    displayIntro()  
  
    caveNumber = chooseCave()  
  
    checkCave(caveNumber)  
  
    print 'Do you want to play again? (yes or no)'  
    playAgain = raw_input()
```

Global Scope

```
playAgain == 'y'
```

```
caveNumber == '1'
```

Local Scope

```
chosenCave == '1'
```

```
friendlyCave == 2
```

Code Explanation – step by step

```
friendlyCave = random.randint(1, 2)

if chosenCave == str(friendlyCave):
    print 'Gives you his treasure!'
else:
    print 'Gobbles you down in one bite!'

playAgain = 'yes'
while playAgain == 'yes' or playAgain == 'y':

    displayIntro()

    caveNumber = chooseCave()

    checkCave(caveNumber)

    print 'Do you want to play again? (yes or no)'
    playAgain = raw_input()
```

Global Scope

```
playAgain == 'y'
```

```
caveNumber == '1'
```

Code Explanation – step by step

```
friendlyCave = random.randint(1, 2)

if chosenCave == str(friendlyCave):
    print 'Gives you his treasure!'
else:
    print 'Gobbles you down in one bite!'

playAgain = 'yes'
while playAgain == 'yes' or playAgain == 'y':

    displayIntro()

    caveNumber = chooseCave()

    checkCave(caveNumber)

    print 'Do you want to play again? (yes or no)'
    playAgain = raw_input()
```

Global Scope

```
playAgain == 'y'
```

```
caveNumber == '1'
```

Code Explanation – step by step

```
friendlyCave = random.randint(1, 2)

if chosenCave == str(friendlyCave):
    print 'Gives you his treasure!'
else:
    print 'Gobbles you down in one bite!'

playAgain = 'yes'
while playAgain == 'yes' or playAgain == 'y':

    displayIntro()

    caveNumber = chooseCave()

    checkCave(caveNumber)

    print 'Do you want to play again? (yes or no)'
    playAgain = raw_input()
```

Global Scope

```
playAgain == 'n'
```

```
caveNumber == '1'
```

Code Explanation – step by step

```
friendlyCave = random.randint(1, 2)

if chosenCave == str(friendlyCave):
    print 'Gives you his treasure!'
else:
    print 'Gobbles you down in one bite!'
```

```
playAgain = 'yes'
while playAgain == 'yes' or playAgain == 'y':
```

```
    displayIntro()
```

```
    caveNumber = chooseCave()
```

```
    checkCave(caveNumber)
```

```
    print 'Do you want to play again? (yes or no)'
    playAgain = raw_input()
```

Global Scope

```
playAgain == 'n'
```

```
caveNumber == '1'
```

Code Explanation – step by step

```
friendlyCave = random.randint(1, 2)

if chosenCave == str(friendlyCave):
    print 'Gives you his treasure!'
else:
    print 'Gobbles you down in one bite!'

playAgain = 'yes'
while playAgain == 'yes' or playAgain == 'y':

    displayIntro()

    caveNumber = chooseCave()

    checkCave(caveNumber)

    print 'Do you want to play again? (yes or no)'
    playAgain = raw_input()
```

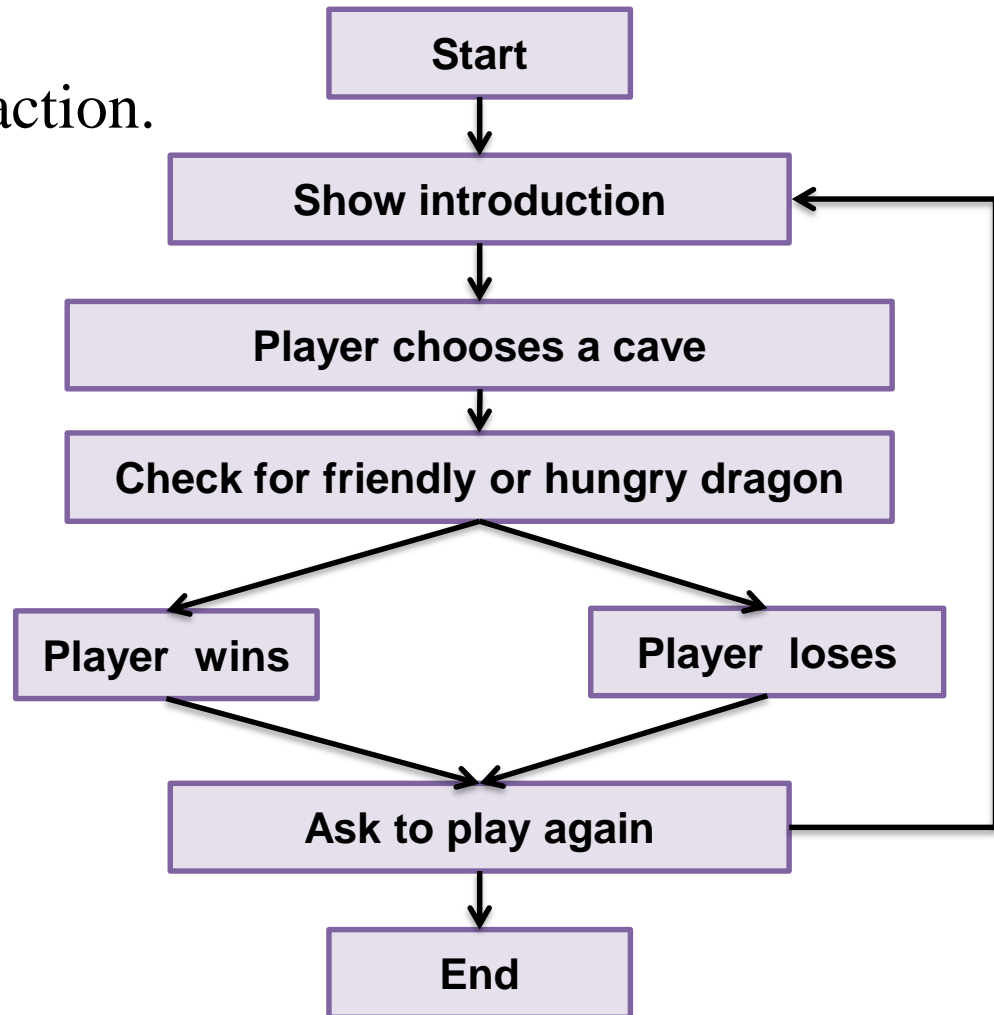
Global Scope

playAgain == 'n'

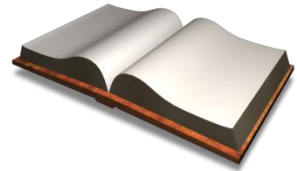
caveNumber == '1'

Designing the Program

- Flow chart
 - shows every possible action.



Things Covered In This Chapter



- The `time` module.
- The `time.sleep()` function.
- Creating our own functions with the `def` keyword.
- The `return` keyword.
- The `and` and `or` and `not` boolean operators.
- Truth tables
- Variable scope (Global and Local)
- `if`, `else`, `elif`
- Parameters and Arguments
- Flow charts