

Lesson 09: Nested selection

What will these logical expressions evaluate to?

Use the **starter activity** worksheet to evaluate the logical expressions.

Starter Activity

What will these logical expressions evaluate to?

Logical expression	True / False
$(5+3/2) < 5$ and $9+2 == 12$	
$7 == 8-2$ or $9 > 6$	
<i>Given that the value of num is 12</i> $num == (8*3)/2$	
<i>Given that the value of age is 40</i> $age > (80/2)$	

Answers

$(5+3/2) < 5$ **and** $9+2 == 12$

False

Answers

`7 == 8-2 or 9 > 6`

True

Answers

Given that the value of num is 12

True

`num == (8*3)/2`

Answers

Given that the value of age is 40

False

`age > (80/2)`



Lesson 11: Nested selection

In this lesson, you will:

- Define nested selection
- Walk through code that uses nested selection
- Modify a program that uses nested selection

Think, write, pair, share



```
1 print("Username: ")
2 username = input()
3 if username == "Eirini":
4     print("Password: ")
5     password = input()
6     if password == "Fish4321":
7         print("Access granted")
```

Question

Explain exactly what you think will happen when this code is executed.

Think about...

What would happen if **Ben** was entered for the username?

What would happen if **Eirini** was entered for the username?

What exactly needs to be inputted to gain access to the system?

Nested selection: definition

When a selection block is placed within another selection block, it is called **nested selection**.

Any type of selection block can be **nested inside** a selection block.



Nested selection: example structures

```
if condition :  
    block of  
    statements
```

```
    if condition :  
        block of  
        statements
```

```
if condition :  
    block of  
    statements
```

```
    if condition :  
        block of  
        statements
```

```
    else:  
        block of  
        statements
```

```
if condition :  
    block of  
    statements
```

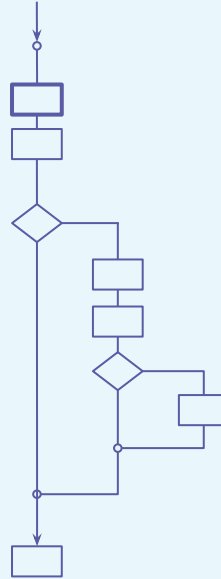
```
    if condition :  
        block of  
        statements
```

```
    elif condition :  
        block of  
        statements
```

```
    else:  
        block of  
        statements
```

Nested selection: walkthrough

```
1 print("Username: ")
2 username = input()
3
4 if username == "Eirini":
5     print("Password: ")
6     password = input()
7     if password == "Fish4321":
8         print("Access granted")
9
10 print("...program closing")
```



State

username

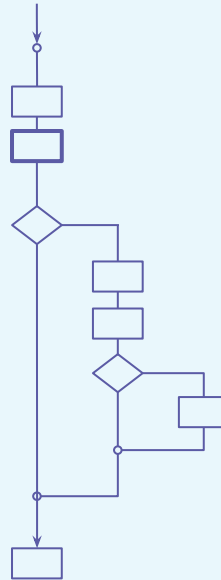
password

Input/output

Username:

Nested selection: walkthrough

```
1 print("Username: ")
2 username = input()
3
4 if username == "Eirini":
5     print("Password: ")
6     password = input()
7     if password == "Fish4321":
8         print("Access granted")
9
10 print("...program closing")
```



State

username

Ben

password

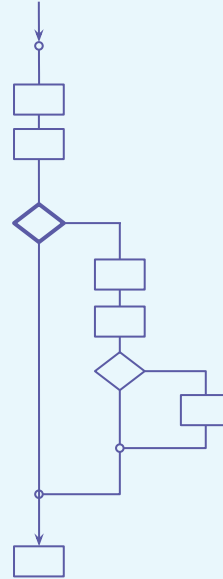
Input/output

Username:

Ben

Nested selection: walkthrough

```
1 print("Username: ")
2 username = input()
3
4 if username == "Eirini":
5     print("Password: ")
6     password = input()
7     if password == "Fish4321":
8         print("Access granted")
9
10 print("...program closing")
```



State

username

Ben

password

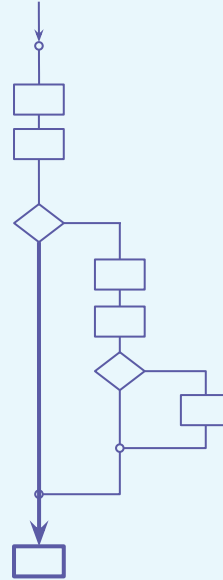
Input/output

Username:

Ben

Nested selection: walkthrough

```
1 print("Username: ")
2 username = input()
3
4 if username == "Eirini":
5     print("Password: ")
6     password = input()
7     if password == "Fish4321":
8         print("Access granted")
9
10 print("...program closing")
```



State

username

Ben

password

Input/output

Username:

Ben

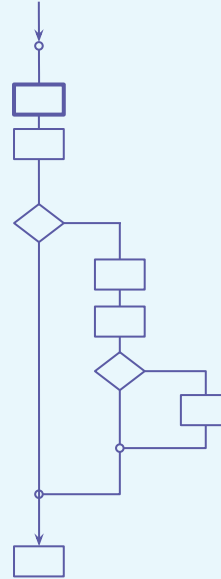
...program closing

>>>

Nested selection: walkthrough



```
1 print("Username: ")
2 username = input()
3
4 if username == "Eirini":
5     print("Password: ")
6     password = input()
7     if password == "Fish4321":
8         print("Access granted")
9
10 print("...program closing")
```



State

username

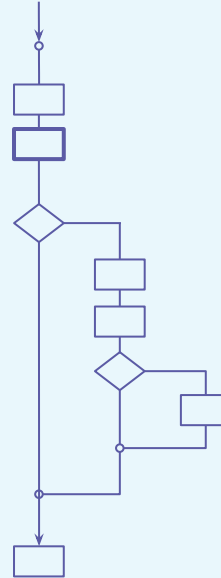
password

Input/output

Username:

Nested selection: walkthrough

```
1 print("Username: ")
2 username = input()
3
4 if username == "Eirini":
5     print("Password: ")
6     password = input()
7     if password == "Fish4321":
8         print("Access granted")
9
10 print("...program closing")
```



State

username

Eirini

password

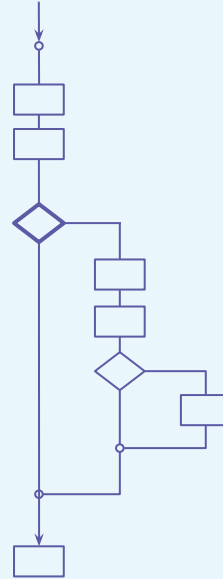
Input/output

Username:

Eirini

Nested selection: walkthrough

```
1 print("Username: ")
2 username = input()
3
4 if username == "Eirini": True
5     print("Password: ")
6     password = input()
7     if password == "Fish4321":
8         print("Access granted")
9
10 print("...program closing")
```



State

username

Eirini

password

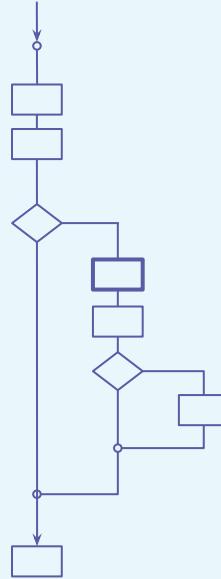
Input/output

Username:

Eirini

Nested selection: walkthrough

```
1 print("Username: ")
2 username = input()
3
4 if username == "Eirini":
5     print("Password: ")
6     password = input()
7     if password == "Fish4321":
8         print("Access granted")
9
10 print("...program closing")
```



State

username

Eirini

password

Input/output

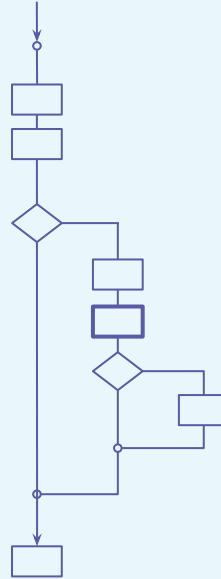
Username:

Eirini

Password:

Nested selection: walkthrough

```
1 print("Username: ")
2 username = input()
3
4 if username == "Eirini":
5     print("Password: ")
6     password = input()
7     if password == "Fish4321":
8         print("Access granted")
9
10 print("...program closing")
```



State

username

Eirini

password

Bob

Input/output

Username:

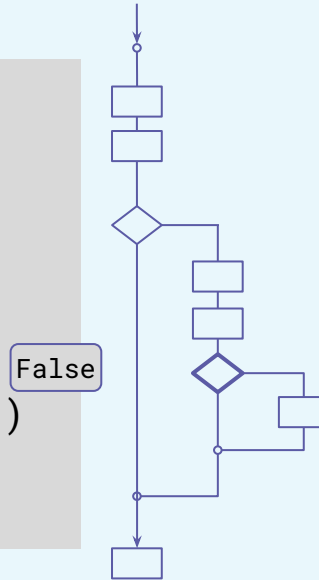
Eirini

Password:

Bob

Nested selection: walkthrough

```
1 print("Username: ")
2 username = input()
3
4 if username == "Eirini":
5     print("Password: ")
6     password = input()
7     if password == "Fish4321":
8         print("Access granted")
9
10 print("...program closing")
```



State

username

Eirini

password

Bob

Input/output

Username:

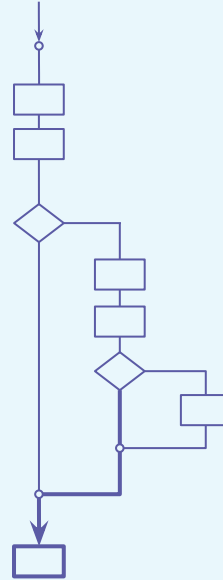
Eirini

Password:

Bob

Nested selection: walkthrough

```
1 print("Username: ")
2 username = input()
3
4 if username == "Eirini":
5     print("Password: ")
6     password = input()
7     if password == "Fish4321":
8         print("Access granted")
9
10 print("...program closing")
```



State

username

Eirini

password

Bob

Input/output

Username:

Eirini

Password:

Bob

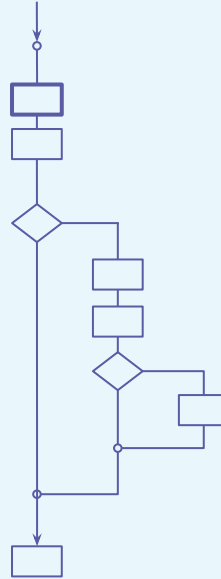
…program closing

>>>

Nested selection: walkthrough



```
1 print("Username: ")
2 username = input()
3
4 if username == "Eirini":
5     print("Password: ")
6     password = input()
7     if password == "Fish4321":
8         print("Access granted")
9
10 print("...program closing")
```



State

username

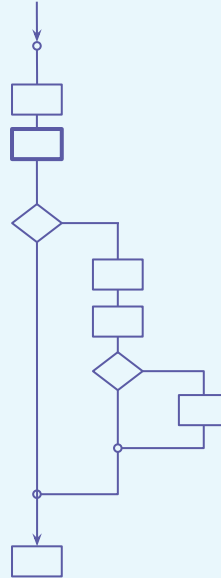
password

Input/output

Username:

Nested selection: walkthrough

```
1 print("Username: ")
2 username = input()
3
4 if username == "Eirini":
5     print("Password: ")
6     password = input()
7     if password == "Fish4321":
8         print("Access granted")
9
10 print("...program closing")
```



State

username

Eirini

password

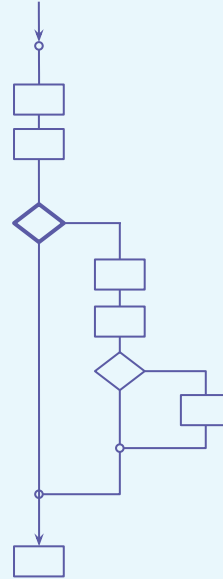
Input/output

Username:

Eirini

Nested selection: walkthrough

```
1 print("Username: ")
2 username = input()
3
4 if username == "Eirini": True
5     print("Password: ")
6     password = input()
7     if password == "Fish4321":
8         print("Access granted")
9
10 print("...program closing")
```



State

username

Eirini

password

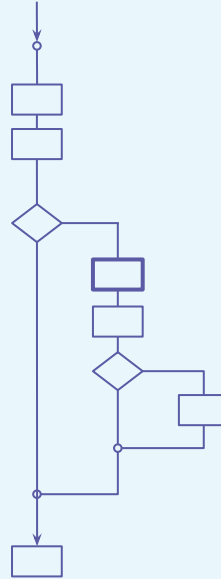
Input/output

Username:

Eirini

Nested selection: walkthrough

```
1 print("Username: ")
2 username = input()
3
4 if username == "Eirini":
5     print("Password: ")
6     password = input()
7     if password == "Fish4321":
8         print("Access granted")
9
10 print("...program closing")
```



State

username

Eirini

password

Input/output

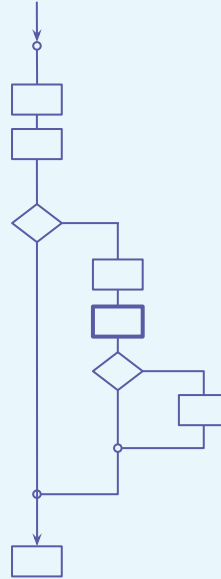
Username:

Eirini

Password:

Nested selection: walkthrough

```
1 print("Username: ")
2 username = input()
3
4 if username == "Eirini":
5     print("Password: ")
6     password = input()
7     if password == "Fish4321":
8         print("Access granted")
9
10 print("...program closing")
```



State

username

Eirini

password

Fish4321

Input/output

Username:

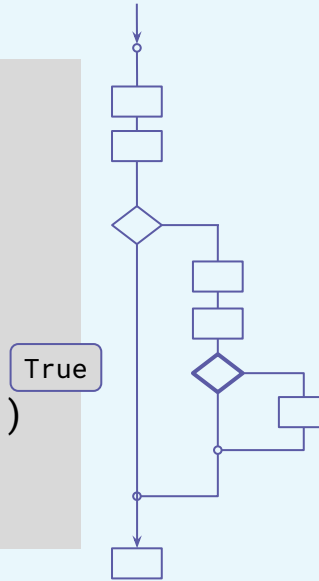
Eirini

Password:

Fish4321

Nested selection: walkthrough

```
1 print("Username: ")
2 username = input()
3
4 if username == "Eirini":
5     print("Password: ")
6     password = input()
7     if password == "Fish4321":
8         print("Access granted")
9
10 print("...program closing")
```



State

username

Eirini

password

Fish4321

Input/output

Username:

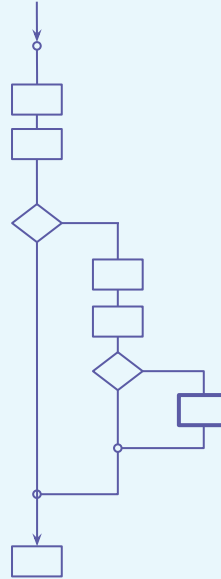
Eirini

Password:

Fish4321

Nested selection: walkthrough

```
1 print("Username: ")
2 username = input()
3
4 if username == "Eirini":
5     print("Password: ")
6     password = input()
7     if password == "Fish4321":
8         print("Access granted")
9
10 print("...program closing")
```



State

username

Eirini

password

Fish4321

Input/output

Username:

Eirini

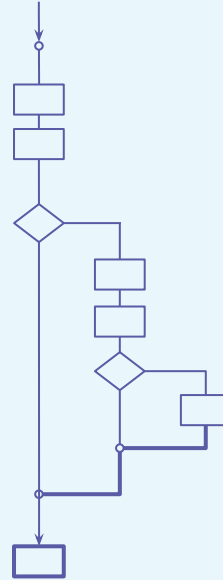
Password:

Fish4321

Access granted

Nested selection: walkthrough

```
1 print("Username: ")
2 username = input()
3
4 if username == "Eirini":
5     print("Password: ")
6     password = input()
7     if password == "Fish4321":
8         print("Access granted")
9
10 print("...program closing")
```



State

username

Eirini

password

Fish4321

Input/output

Username:

Eirini

Password:

Fish4321

Access granted

...program closing

>>>

Guess the animal game

Use the **worksheet** to investigate and modify the 'guess the animal' game.

The activity will allow you to explore nested selection further.

Predict

Take a look at the code below. Read it carefully and explain exactly what might happen when this code is executed. Think about the possible inputs that could be entered and what might happen in each scenario. For example, if the user enters a **y**, what will happen? If the user enters an **n**, what will happen?

```
1 print("Pick either Ostrich, Lion or Whale")
2 print("I will attempt to guess your choice")
3 print("Does the animal live in the water? Y/N")
4 answer = input().lower()
5
6 if answer == "n":
7     print("Does the animal have wings? Y/N")
8     answer = input().lower()
9     if answer == "y":
10        print("It must be an Ostrich!")
11    else:
12        print("It must be a Lion!")
13 else:
14    print("It must be a Whale!")
```

Write your prediction in the space provided below:

Nested selection

```
print("What is your age?")
age = int(input()) #q1
if age > 10:
    print("Total books read in 2019:")
    books = int(input()) #q2
    if books > 10:
        print("That's impressive!")
    else:
        print("You should read more")
else:
    print("I hope you like reading")
```

Question

Assuming that 12 is entered for the first question and 3 is entered for the second. What will be the output?

- ① I hope you like reading
- ▷ ② You should read more
- ③ That's impressive!
- ④ There is an error on line 2 so it will not execute

Nested selection

```
print("What is your age?")
age = int(input()) #q1
if age > 10:
    print("Total books read in 2019:")
    books = int(input()) #q2
    if books > 10:
        print("That's impressive!")
    else:
        print("You should read more")
else:
    print("I hope you like reading")
```

Question

Assuming that **10** is entered for the first question and **10** is entered for the second. What will be the output?

- ① I hope you like reading
- ② You should read more
- ③ That's impressive!
- ▶ ④ The program will never reach question 2

Homework

Complete the vegetable game.

Due: Next lesson

Next lesson

In this lesson, you...

Learnt about and used nested selection

Next lesson, you will...

Learn about repeating sequences of code