

L8: if elif else, flowchart

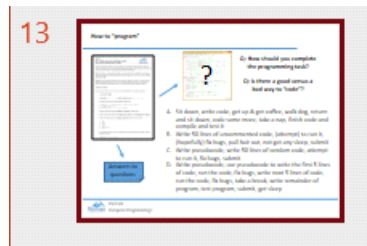
Friday, January 21, 2022 12:07 PM

Don't forget to list events

Test cases and optimizing code

Sunday, January 23, 2022

10:29 PM



L8 1 : 2
A B C D

Test cases:

go one by one.

If code != expected

Fix error

Test to be sure

Start back at 1st test case again
(why? something else may have broken)

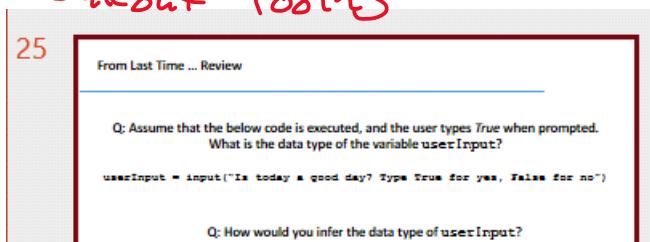
Flow chart:

check off each branch
(protip: prepare test cases for each branch!)

user input:

Assume correct
at this point...

Breakout rooms



L8.3

Q: Assume that the below code is executed, and the user types `True` when prompted. What is the data type of the variable `userInput`?

```
userInput = input("Is today a good day? Type True for yes, False for no")
```

Q: How would you infer the data type of `userInput`?

Q: How could you check if a user typed "True" or "False"?

Q: Assuming the user would only type "True" or "False" when prompted, how might you modify the code so that the data type of the variable `userInput` is of type `Bool/boolean`?

L8.3

1. String

2. `userInput == "True"`

3. `userInput == "True"`

Dangerous! it assumes anything
Not "True" is string "false"
What if they typed garbage?
or lowercase 'true'!
(more in future classes!)

More If Elif Else

Sunday, January 23, 2022 11:16 PM

This code is wrong..

26
4

From Last Time ...

Using the conditional feature of a programming language, we can write programs that 'reason' about complex statements.

Goal: We want to check if two numbers, x and y , are the same, if $x > y$, or $y > x$.

```
if (x == y) :  
    print("x is equal to y")  
else :  
    print("x is less than y")  
if (y < x) :  
    print ("y is less than x")
```

Task : Rewrite the code so that in the best case scenario it performs only a single check (comparison) of the values of the variables x and y .

CSI 341
Western Computer Programming I

Time
to
think

change to

(BEST case 1 check...sometimes 2 checks!!)

```
if (x == y) :  
    print("x is equal to y")  
else :  
    if (x < y) :  
        print("x is less than y")  
    else :  
        print ("y is less than x")
```

Sample solution

Several things to take note of

- Indentation of the code block of the outer if statement
- Indentation of the code block inside the code block of the else statement

How many checks does it do, maximum?

In chat, don't hit enter....go

Slide #35 L8.7

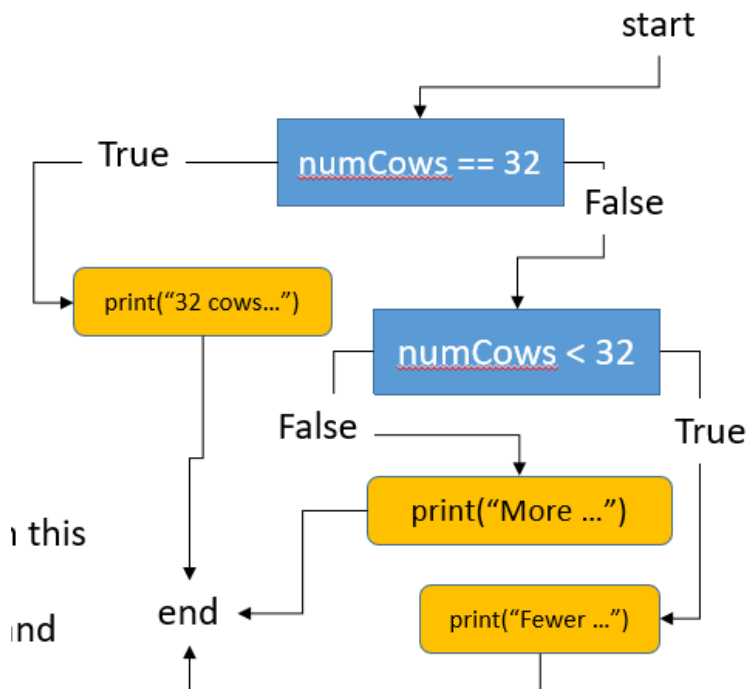
**Task : Draw the flow diagram
for the code in the box**

```
if (numCows == 32) :  
    print("32 cows in the pasture")  
else :  
    if (numCows < 32) :  
        print("Fewer than 32 cows")  
    else :  
        print ("More than 32 cows")
```

2 min Try to draw
on your own

There are multiple approaches

1. Write down all of the statements and all of the conditionals, and then connect them with arrows
2. "build" the flow chart as you "execute" the program in your head



ABCD

53

L8.7

Conditional

There is yet another conditional, that the e-book calls a chained conditional

```
if (numCows == 32) :
    print("32 cows in the pasture")
elif (numCows < 32) :
    print("Fewer than 32 cows")
else :
    print("More than 32 cows")
```

Q: How many print statements is/are executed when this program is run?



- A. 1
- B. 2
- C. 1 or 2
- D. None of the above

Breakout rooms

61

L8.7

Conditional

```
if (numCows == 32) :
    print("32 cows in the pasture")
elif (numCows < 32) :
    print("Fewer than 32 cows")
else :
    print("More than 32 cows")
```

```
if (numCows == 32) :
    print("32 cows in the pasture")
else :
    if (numCows < 32) :
        print("Fewer than 32 cows")
    else :
        print("More than 32 cows")
```

How are nested ifs and chained conditionals related?

Q: Do the two pieces of code above output the same thing when ...

```
numCows = 32
numCows = 16
numCows = 70
```

Q: Do the two pieces of code above output the same thing when ...

<u>numCows</u> = 32	→	32 cows in the pasture
<u>numCows</u> = 16	→	Fewer than 32 cows
<u>numCows</u> = 70	→	More than 32 cows

numcows

Sunday, January 23, 2022 11:11 PM

- 1 #1) else is optional
- 2 #2) unlimited elifs allowed
- 3 #3) else must be last

open numCows.py

```
1 numCows = 7823
2
3 if (numCows == 32) :
4     print("32 cows in the pasture")
5 elif (numCows == 31):
6     print("31 cows")
7 elif(numCows < 23):
8     print("fewer than 23 cows")
9 elif(numCows > 2323):
10    print("MOOOOO\n\n\n\n\n")
11 elif (numCows == 7823):
12    print("Too many cows \n\n\n\n\n")
13 else:
14    print("Some cows")
```

See: lots of elif!

Could this be better arranged?
define 'better'!

- Easy for humans to understand
- Faster code (fewer comparisons)

70

Chained Conditionals

```
if (numCows == 32) :
    print("32 cows in the pasture")
elif (numCows == 31) :
    print("31 cows")
elif (numCows < 23) :
    print("Fewer than 23 cows")
elif (numCows > 2323) :
    print("MOOOO")
elif (numCows == 7823) :
    print("Too many cows")
```

"rules" for if, elif, and else statements

- The else clause is optional
- You can have an unlimited number of elif statements

Q: What is printed when
numCows = 7823?

- A. 32 cows in the pasture
- B. 31 cows
- C. Fewer than 23 cows
- D. MOOOO



A
B
C
D

Extra ABCDs

Sunday, January 23, 2022

10:13 PM

58

Nested Conditionals

Suppose $x = 4$ and $y = 5$. How many comparison operators ($<$, $>$) are evaluated by the following code?



- A. 0
- B. 1
- C. 2
- D. 3

```
# assume x and y are numbers
if x < y:
    print("x is less than y")
else:
    if x > y:
        print("x is greater than y")
    else:
        print("x and y must be equal")
```

There are supplemental worksheets on Canvas for extra help.

Q1: What does the program C1 print to the screen? Write your answer in the box labeled Output.

Code 1	<pre>wwuFounded = 1893 if ((wwuFounded // 1000) < 1): wwuFounded = "eighteen ninety three" if (type(wwuFounded) == type("aString")): print("WWU was founded in", wwuFounded) else: print("Year founded:", wwuFounded)</pre>
Output	

Q2: Circle all letter choices which specify Boolean values / expressions for the grey box in program C2 such that the program prints True to the screen.

C2	<pre>print((True and (<input type="text"/> or not True)) and not False)</pre>
----	--

- A. True
- B. False
- C. not True
- D. not False
- E. $3 == 4$
- F. $3 != 4$