

LECTURE 8 WEEK 4

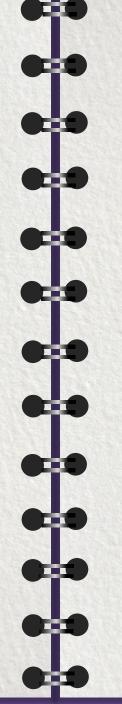
CONCEPT REVIEW



CONTROL STRUCTURES ALLOW NON SEQUENTIAL FLOW



BOOLEAN EXPRESSIONS EVALUATE TO TRUE OR FALSE





IF STATEMENT SYNTAX REQUIRES A COLON AND INDENTED CODE

if <condition>:
 # executed if true
executed if true



```
# Author: Alison
# Purpose: This program issues hot and cold temperature warnings
HIGH_WARNING = 32
LOW_WARNING = 4
SNOWFKAKE = "\u2744"
SUN = "\u2600"
temperature = float(input("Enter the temperature in Celsius: "))
if temperature > HIGH_WARNING:
    print(SUN*29)
    print(f"{SUN}Be careful, it's really hot out there!{SUN}")
    print(SUN*29)
if temperature < LOW_WARNING:</pre>
    print(SNOWFKAKE*33)
    print(f"{SNOWFKAKE}Make sure you dress warmly, its cold out there!{SNOWFKAKE}")
    print(SNOWFKAKE * 33)
```

ELIF STATEMENTS

INEFFICIENCY

- WE ARE MAKING PYTHON WORK TOO HARD
- IF A TEMPERATURE TRIGGERS A HIGH WARNING IT CANNOT ALSO TRIGGER A LOW WARNING SO WHY BOTHER CHECKING FOR IT?
 - > IF THE TEMPERATURE IS HIGH, DISPLAY A HEAT WARNING
 - > OR ELSE IF IT IS LOW, DISPLAY A COLD WARNING

if <condition>:
 # executed if true
elif <condition>:
 # executed if true



```
# Author: Alison
                                                                    THIS WILL RUN AS BEFORE BUT
# Purpose: This program issues hot and cold temperature warnings
                                                                      WILL BE MORE EFFICIENT
                                                                     BECAUSE IT WILL NOT EXECUTE
HIGH_WARNING = 32
                                                                      LINES OF CODE IF IT DOESN'T
LOW_WARNING = 4
                                                                              OT 3VAH
SNOWFLAKE = "\u2744"
SUN = "\u2600"
temperature = float(input("Enter the temperature in Celsius: "))
if temperature > HIGH_WARNING: # if
    print(SUN*29)
   print(f"{SUN}Be careful, it's really hot out there!{SUN}")
   _print(SUN*29)
elif temperature < LOW_WARNING: # else if -> elif
    print(SNOWFLAKE * 33)
    print(f"{SNOWFLAKE}Make sure you dress warmly, its cold out there!{SNOWFLAKE}")
   print(SNOWFLAKE * 33)
```

WHAT ABOUT "NORMAL" TEMPERATURES?

LET'S ADD A GENERIC OUTPUT FOR TEMPERATURES IN THE NORMAL RANGE.

NOW WE HAVE 3 POSSIBLE CODE FLOW SEQUENCES:

- If the temperature is high,
 DISPLAY A HEAT WARNING
- OR ELSE IF IT IS LOW DISPLAY A COLD WARNING
- OR ELSE, DISPLAY A GENERIC "NICE DAY" MESSAGE



```
# Author: Alison
# Purpose: This program issues hot and cold temperature warnings
HIGH_WARNING = 32
LOW_WARNING = 4
SNOWFLAKE = "\u2744"
SUN = "\u2600"
SMILEY_FACE = "\u263A"
temperature = float(input("Enter the temperature in Celsius: "))
if temperature > HIGH_WARNING: # if
    print(SUN*29)
    print(f"{SUN}Be careful, it's really hot out there!{SUN}")
    print(SUN*29)
elif temperature < LOW_WARNING: # else if -> elif
    print(SNOWFLAKE * 33)
    print(f"{SNOWFLAKE}Make sure you dress warmly, its cold out there!{SNOWFLAKE}")
    print(SNOWFLAKE * 33)
else:
    print(SMILEY_FACE * 12)
    print(f"{SMILEY_FACE}What a nice day!{SMILEY_FACE}")
    print(SMILEY_FACE * 12)
```

IF THE FIRST TWO
CONDITIONS EVALUATE TO
FALSE WE HAVE A DEFAULT
STATEMENT I.E. AN ELSE

IF CAN BE USED TO CREATE MENUS IN PYTHON.
THESE ALLOW DIFFERENT OUTCOMES BASED ON A USER'S INPUT.

```
COFFEE = 2.20
TEA = 1.70
MILK = 1.65
menu = "Would you like " \
       "\n\t1: Coffee" \
       "\n\t2: Tea" \
       "\n\t3: Milk" \
       "\n==> "
choice = int(input(menu))
cost = 0
if choice == 1:
    cost = COFFEE
elif choice == 2:
    cost = TEA
elif choice == 3:
    cost = MILK
print(f"That will be €{cost:.2f}")
```

EXERCISE

NUMBER CHECKER

- READ AN INTEGER NUMBER
 FROM THE USER
- DETERMINE IF THE NUMBER IS:
 - > ZERO
 - > POSITIVE
 - > NEGATIVE

if <condition>:
 # executed if true
elif <condition>:
 # executed if true
else:
 # executed otherwise

STRING COMPARISON

Strings Using Strings in selection statements

Comparing Strings

- Compare strings using= and !=
- String comparison are case sensitive

"Hello" == "Hello" True
"Hello" == "hELLO" False

4.3

- Strings can be compared using >, <,>=, and <=
- Compared character by character based on the ASCII values for each character
- If shorter word is has all the letters of a longer word, the longer word is greater than shorter word e.g. "Sur" is less than "Sure"

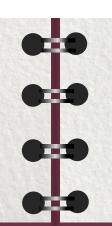


ASCII Table

Dec	Hex	0ct	Char	Dec	Hex	0ct	Char	Dec	Hex	0ct	Char	Dec	Hex	0ct	Char
0	0	0		32	20	40	[space]	64	40	100	@	96	60	140	`
1	1	1		33	21	41	!	65	41	101	Α	97	61	141	а
2	2	2		34	22	42	"	66	42	102	В	98	62	142	b
3	3	3		35	23	43	#	67	43	103	С	99	63	143	С
4	4	4		36	24	44	\$	68	44	104	D	100	64	144	d
5	5	5		37	25	45	%	69	45	105	Е	101	65	145	e
6	6	6		38	26	46	&	70	46	106	F	102	66	146	f
7	7	7		39	27	47		71	47	107	G	103	67	147	g
8	8	10		40	28	50	(72	48	110	Н	104	68	150	h
9	9	11		41	29	51)	73	49	111	11	105	69	151	i
10	Α	12		42	2A	52	*	74	4A	112	J	106	6A	152	j
11	В	13		43	2B	53	+	75	4B	113	K	107	6B	153	k
12	C	14		44	2C	54	,	76	4C	114	L	108	6C	154	1
13	D	15		45	2D	55	-	77	4D	115	М	109	6D	155	m
14	E	16		46	2E	56		78	4E	116	N	110	6E	156	n
15	F	17		47	2F	57	/	79	4F	117	0	111	6F	157	О
16	10	20		48	30	60	0	80	50	120	Р	112	70	160	р
17	11	21		49	31	61	1	81	51	121	Q	113	71	161	q
18	12	22		50	32	62	2	82	52	122	R	114	72	162	r
19	13	23		51	33	63	3	83	53	123	S	115	73	163	S
20	14	24		52	34	64	4	84	54	124	Т	116	74	164	t
21	15	25		53	35	65	5	85	55	125	U	117	75	165	u
22	16	26		54	36	66	6	86	56	126	V	118	76	166	V
23	17	27		55	37	67	7	87	57	127	W	119	77	167	w
24	18	30		56	38	70	8	88	58	130	Х	120	78	170	x
25	19	31		57	39	71	9	89	59	131	Υ	121	79	171	у
26	1A	32		58	3A	72	:	90	5A	132	Z	122	7A	172	z
27	1B	33		59	3B	73	;	91	5B	133	لہا	123	7B	173	لها
28	1C	34		60	3C	74	<	92	5C	134	\	124	7C	174	
29	1D	35		61	3D	75	=	93	5D	135]	125	7D	175	}
30	1E	36		62	3E	76	>	94	5E	136	^	126	7E	176	~
31	1F	37		63	3F	77	?	95	5F	137	_	127	7F	177	

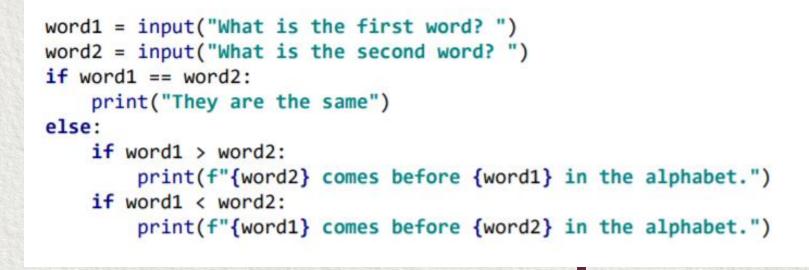


```
word1 = input("What is the first word? ")
word2 = input("What is the second word? ")
if word1 == word2:
    print("They are the same")
elif word1 > word2:
    print(f"{word2} comes before {word1} in the alphabet.")
elif word1 < word2:
    print(f"{word1} comes before {word2} in the alphabet.")</pre>
```



What is the first word? dog
What is the second word? cat
cat comes before dog in the alphabet.

SAMPLE CODE





What is the first word? dog
What is the second word? cat
cat comes before dog in the alphabet.



DEALING WITH CASE

ALTERNATIVELY USE . UPPER() TO UPPERCASE BOTH WORDS OR .CAPITALIZE() TO ENSURE THE FIRST LETTER IS UPPERCASED AND ALL OTHER LETTERS ARE LOWERED.

word1 = input("What is the first word? ") word2 = input("What is the second word? ") # convert them both to the same case # to compare Like with Like word1 = word1.lower() word2 = word2.lower() if word1 == word2: print("They are the same") elif word1 > word2: print(f"{word2} comes before {word1} in the alphabet.") elif word1 < word2: print(f"{word1} comes before {word2} in the alphabet.")

DEALING WITH CASE

LET'S IMAGINE WE WANT TO IGNORE CASE SO THIS WON'T HAPPEN

> What is the first word? cat What is the second word? Cat Cat comes before cat in the alphabet.

STUDENT FEEDBACK

Key takeaways

- Exercises in lectures and labs are a positive
- Some people like group work and others don't - so we will keep doing it
- Additional exercises at the end of labs



USING % (MODULUS) IN BOOLEAN EXPRESSIONS

- REVISIT YOUR EARLIER CODE TO READ A NUMBER AND DETERMINE IF IT WAS POSITIVE, NEGATIVE OR ZERO
 - * ADD CODE TO DETERMINE IF THE NUMBER IS EVEN I.E. DIVISIBLE BY 2 OR ODD





GRADES

- WRITE A PROGRAM TO READ THREE GRADES FROM THE USER.
- FIND THE AVERAGE OF THE THREE GRADES.
 - ❖ IF THE AVERAGE GRADE IS LESS THAN 40, DISPLAY "FAIL".
 - ◆ OR ELSE IF THE AVERAGE GRADE EQUALS 40, DISPLAY "PASS BUT ONLY JUST!"
 - OR ELSE IF THE AVERAGE GRADE EXCEEDS 40, DISPLAY "PASS"

