### EXERCISE

\*\* 1. Given a = [12,23,6,123,99,108], find the largest number in a \*\*

a = [12,23,6,123,99,108]

max(a)

\*\* 2.With the same list, find the smallest number using sort(). The largest? \*\*

a.sort()

a

## LARGEST

a[-1]

## SMALLEST

a[1]

\*\* 3. Given b = [“apple”, “banana”, “pear”, “orange”, “pomelo”, “lime”], create a dictionary using a and b(hint: use function zip() first) \*\*

b = ["apple", "banana", "pear", "orange", "pomelo", "lime"]

a\_b = zip(b,a)

a\_b\_dict = dict(a\_b)

a\_b\_dict

\*\* 4. Given c = (12, 6, 1, 8, 10, 17), find the numbers between second and fifth, inclusive.\*\*

c = (12, 6, 1, 8, 10, 17)

c[1:5]

\*\* 5. Delete the smallest number in a. In c?\*\*

a

#using del

del a[0]

a

a = [12,23,6,123,99,108]

a.sort()

# using remove

a.remove(6)

a

a = [12,23,6,123,99,108]

a.sort()

#using pop

a.pop(0)

a

cannot modify c because it’s a tuple

**Control Flow**

**IF ELSE Statement**

An **if** statement is a programming conditional statement that, if proved true, performs a function or displays information.

An **else** statement contains the block of code that executes if the conditional expression in the if statement resolves to 0 or a FALSE value. The *else* statement is an optional statement and there could be at most only one **else** statement following **if**.

**Syntax**

if expression:

statement(s)

else:

statement(s)

**IF Statement:**

EX.

X = 3

if (X < 10) :

print ("Hello John")

**Combined:**

a = 10

b = 20

if a == b:

print('yes')

else:

print('no')

**Now, try the same – but set b to 10!**

a = 10

b = 10

if a == b:

print('yes')

else:

print('no')

**More Complex EX with satisfying two conditions at same time:**

a = 10

b = 20

c = 30

if (a + b) / c == 1 and c - b - a == 0:

print('yes')

else:

print('no')

**elif Statement:**

**elif** is short for else if. The **elif** statement allows you to check multiple expressions. However, unlike **else**, there can be an arbitrary number of **elif** statements following an **if**.

**syntax**

if expression1:

statement(s)

elif expression2:

statement(s)

elif expression3:

statement(s)

else:

statement(s)

EX.

a = 10

b = 11

c = 10

if a == b:

print('first condition is true')

elif a == c:

print('second condition is true')

else:

print('nothing is true.')

Change c =13

a = 10

b = 11

c = 13

if a == b:

print('first condition is true')

elif a == c:

print('second condition is true')

else:

print('nothing is true.')

**Little Exercise:**

**Exercise #1**

Write a program that gives us a letter grade based on score. Ex: >=90 is A, >=80 is B, etc.

**Sol:**

if score >= 90:

letter = 'A'

elif score >= 80:

letter = 'B'

elif score >= 70:

letter = 'C'

elif score >= 60:

letter = 'D'

else:

letter = 'F'

print(letter)

**Exercise #2**

Here’s a random integer: 918652728452151.

First, I’d like to know 2 things about this number:

1. Is it divisible by 17?
2. Does it have more than 12 digits?

If both of these conditions are true, then I want to print “super17“.

And if either of the conditions are false, then I’d like to run a second test on it:

1. Is it divisible by 13?
2. Does it have more than 10 digits?

If both of these two new conditions are true, then I want to print “awesome13“.

And if the original number is not classified as “super17” nor “awesome13“, then I’ll just print: “just an average random number“.

**Sol:**

num = 918652728452151

if num % 17 == 0 and len(str(num)) > 12:

print("super17")

elif num % 13 == 0 and len(str(num)) > 10:

print("awesome13")

else:

print("just a random number")

**Exercise #3**

Write a Python program to convert temperatures to and from celsius, fahrenheit.   
[ Formula : c/5 = (f-32)/9 [ where c = temperature in celsius and f = temperature in fahrenheit ]

C = (5/9) \* (F - 32)

F = 9\*C/5+32

degree =

letter =

if letter == "C":

result = int((9 \* degree) / 5 + 32)

convention = "Fahrenheit"

elif letter == "F":

result = int((degree - 32) \* 5 / 9)

convention = "Celsius"

else:

print("convention not found.")

print("The temperature in", convention, "is", result, "degrees.")

**While Loop**

**The while loop tells the computer to do something as long as the condition is met.**

EX.

count = 0

while (count < 9):

print 'The count is:', count

count = count + 1

print "Good bye!"

**break** statement: With the break statement, we can stop the loop even if the while condition is true

Ex.

i = 1  
while i < 6:  
  print(i)  
  if i == 3:  
    break  
  i += 1

**continue** statement: With the continue statement we can stop the current iteration, and continue with the next

Ex.

i = 0  
while i < 6:  
  i += 1   
  if i == 3:  
    continue  
  print(i)

Question:

var i = 0;

while (i < 3):

println("hi");

i = i+1;

answer: **a. hi hi hi** b.hi hi c. hi

var i = 0;

while (i < 3):

print("hi");

I = i+1;

print("bye");

answer: a. hi bye b.hi bye hi bye hi bye **c.hi hi hi bye**

var i = 0;

while (i < 0):

print("hi")

What does the code output? A. error **b.nothing** c. hi

var x = 3;

var i = 0;

while (i < 3):

x = x+1;

i = i+1;

print(x)

answer: a. 7 b.3 c.4 **d.6**

**Combine with else statement**

**Q:** We want to see if a number is less than 5

num = 0

while num < 5:

print (num, " is less than 5")

count = num + 1

else:

print (num, " is not less than 5")

**Litte interactive game:**

#1. Return the length of the input string, if input = quit, break

while True:

s = input('Enter something : ')

if s == 'quit':

break

print('Length of the string is', len(s))

print('Done')

#2. Return the length of an input string if input = quit, break. If length of string less than 3, give feedback and continue

while True:

s = input('Enter something : ')

if s == 'quit':

break

if len(s) < 3:

print('Too small')

continue

print('Length of the string is', len(s))

print("Done")

#3. Input a number and gives feedback. Ex. if number = 30 and guess is 23, feedback = ‘little lower’, if guess is 20, feedback = ‘little higher’, if guess = 30, feedback = “congrats”. Upgrade: 10 chances? Check range(1-100)?

number = 23

running = True

while running:

guess = int(input('Enter an integer : '))

if guess == number:

print('Congratulations, you guessed it.')

running = False

elif guess < number:

print('No, it is a little higher than that.')

else:

print('No, it is a little lower than that.')

Upgraded:

while running:

guess = int(input('Enter an integer : '))

if guess <1 or guess >100:

print('please enter a number between 1 to 100')

continue

elif guess == number:

print('Congratulations, you guessed it.')

running = False

chances = chances - 1

print('chances remaining', chances)

if chances <1:

print("You have used up your chances, the correct number is ", number)

running = False

elif guess < number:

print('No, it is a little higher than that.\n')

else:

print('No, it is a little lower than that.\n')

Exercise:

1. Write a program that asks the user if he/she likes python. Print “awesome” if the answer is ‘yes’ and print “wrong answer, try again” if the answer is ‘no’
2. Write a program that requires the user to input a letter, if the letter is ‘a’ or ‘A’, print ‘awesome’, otherwise print “I was thinking about ‘a’/ ‘A’ ”
3. Let the user choose from a, b, c and print the letter the user chose. For example, if the user choose letter a, the program should print: you chose a. if the user input an invalid letter, print: the letter is invalid. Write this program using if-else statement. (hint: you might want to add elif in there)