TYPE THIS IN THE CONSOLE -- STRINGS

```
a = 'me'
b = "myself"
c = a + b
d = a + " " + b
silly = a * 3

s = "abc"
len(s)
```

ANSWER:

```
>>> a = 'me'
>>> b = "myself"
>>> c = a + b
>>> d = a + " " + b
>>> silly = a * 3
>>>
>>> s = "abc"
>>> len(s)
3
```

TYPE THIS IN THE CONSOLE -- INDEXING

```
s = "abc"
s[0]
s[1]
s[2]
#s[3]  # this is an error
s[-1]
s[-2]
s[-3]
```

ANSWER:

```
>>> s = "abc"
>>> s[0]
'a'
>>> s[1]
'b'
>>> s[2]
'c'
>>> #s[3]  # this is an error
>>> s[-1]
'c'
>>> s[-2]
'b'
>>> s[-3]
'a'
>>>
```

TYPE THIS IN THE CONSOLE -- SLICING

```
s = "abcdefgh"
s[3:6]
s[3:6:2]
s[:]
s[::-1]
s[4:1:-2]
```

ANSWER:

```
>>> s = "abcdefgh"
>>> s[3:6]
'def'
>>> s[3:6:2]
'df'
>>> s[:]
'abcdefgh'
>>> s[::-1]
'hgfedcba'
>>> s[4:1:-2]
'ec'
>>>
```

TYPE THIS IN THE CONSOLE - MANIPULATION

```
s = "car"
#s[0] = 'b'  # this is an error
s = 'b'+s[1:len(s)]
```

ANSWER:

```
>>> s="car"
>>> s[0]='b'
Traceback (most recent call last):
  File "<stdin>", line 1, in <module>
TypeError: 'str' object does not support item assignment
>>> s = 'b'+s[1:len(s)]
>>> s
'bar'
>>>
```

```
##########################################
############### LECTURE ##################################
##########################################
```

 # ## PRINTING ##

```
>>> a = "the"
>>> b = 3
>>> c = "musketeers"
```

```
>>> print(a, b, c)
the 3 musketeers
>>> print(a + b + c)
Traceback (most recent call last):
  File "<stdin>", line 1, in <module>
TypeError: can only concatenate str (not "int") to str
>>> print(a + str(b) + c)
the3musketeers
>>>
>>> num = 5
>>> print("my num is", num)
my num is 5
>>> s = "my num is" + str(num)
>>> print(s)
my num is5
>>>

>>> x = 1
>>> x_str = str(x)
>>> print("my fav num is", x, ".", "x =", x)
my fav num is 1 . x = 1
>>> print("my fav num is " + x_str + ". " + "x = " + x_str)
my fav num is 1. x = 1
>>>

# ## USER INPUT ##
# #Example 1
>>> text = input("Type anything... ")
Type anything... hi
>>> print(5*text)
hihihihihi
>>>
# #Example 2
>>> num1 = input("Type a number: ")
Type a number: 6
>>> print(5*num1)
66666
>>> m2 = int(input("Type a number: "))
Type a number: 78
>>> print(5*m2)
390
>>>
############### YOU TRY IT ################
# Write a program that:
# * Asks the user for a verb.
# * Prints "I can _ better than you" where you replace _ with the verb.
# * Then prints the verb 5 times in a row separated by spaces.
# For example, if the user enters run, you print:
```

 # I can run better than you!
 # run run run run run

ANSWER:
```
verb=input("Enter the verb: ")
print(f"I can {verb} better than you")
print((verb+" ")*4+verb)
```
OUTPUT:
```
verb=input("Enter the verb: ")
print(f"I can {verb} better than you")
print((verb+" ")*4+verb)
```

##

 # #Example 3 - Newton's Method for cube root
```
# x = int(input('What x to find the cube root of? '))
# g = int(input('What guess to start with? '))

# print('Current estimate cubed = ', g**3)
# next_g = g - ((g*3 - x)/(3*g*2))
# print('Next guess to try = ', next_g)
```
ANSWERS:
```
What x to find the cube root of? 9
What guess to start with? 8
Current estimate cubed =  512
Next guess to try =  7.6875
```

 # ## F-STRINGS ##
```
# num = 3000
# fraction = 1/3
# print(num*fraction, 'is', fraction*100, '% of', num)
# print(num*fraction, 'is', str(fraction*100) + '% of', num)
# print(f'{num*fraction} is {fraction*100}% of {num}')

# print(f'{num*fraction:,.0f} is {fraction*100:,.2f}% of {num:,}')
```
ANSWERS:
```
1000.0 is 33.33333333333333 % of 3000
1000.0 is 33.33333333333333% of 3000
1000.0 is 33.33333333333333% of 3000
1,000 is 33.33% of 3,000
```

```
# pset_time = 15
# sleep_time = 8
# print(sleep_time > pset_time)
```

```
# derive = True
# drink = False
# both = drink and derive
# print(both)
```
ANSWER:
```
False
False
```

############### YOU TRY IT ###############
 # Write a program that:
 # * Saves a secret number.
 # * Asks the user for a number guess.
 # * Prints a bool depending on whether the guess matches the secret.

ANSWER:
```
secret=10
d=int(input("Enter the secret number: "))
print(d==secret)
```
OUTPUT:
```
PS D:\python> python 1.py
Enter the secret number: 6
False
PS D:\python> python 1.py
Enter the secret number: 9
False
PS D:\python> python 1.py
Enter the secret number: 10
True
```

##

 # ## BRANCHING ##
 # #Example 1
```
# pset_time = 22
# sleep_time = 8
# if (pset_time + sleep_time) > 24:
#     print("impossible!")
# elif (pset_time + sleep_time) >= 24:
#     print("full schedule!")
# else:
#     leftover = abs(24-pset_time-sleep_time)
#     print(leftover,"h of free time!")
# print("end of day")
```
ANSWER:
```
impossible!
end of day
```

############## YOU TRY IT ###############

 # # Buggy, fix it!

```
# x = int(input("Enter a number for x: "))
# y = int(input("Enter a different number for y: "))
# if x == y:
#     print(x,"is the same as",y)
# print("These are equal!")
```

ANSWER:

```
x = int(input("Enter a number for x: "))
y = int(input("Enter a different number for y: "))
if x == y:
   print(x,"is the same as",y)
print("These are not equal!")
```

##

 # ## NESTED BRANCHING ##

 # #Example 1

```
# x = float(input("Enter a number for x: "))
# y = float(input("Enter a number for y: "))
# if x == y:
#     print("x and y are equal")
#     if y != 0:
#         print("therefore, x / y is", x/y)
# elif x < y:
#     print("x is smaller")
# else:
#     print("y is smaller")
# print("thanks!")
```

ANSWER:

```
Enter a number for x: 7
Enter a number for y: 8
x is smaller
thanks!
```

############## YOU TRY IT ###############

```
# What's printed when y = 2, y = 20, y = 11?
# What if "if x <= y:" becomes "elif x <= y:"

# answer = ''
# x = 11
# y = 2 # try 20 and 11
# if x == y:
#     answer = answer + 'M'
# if x <= y:   # try making this line: elif x <= y:
#     answer = answer + 'i'
```

```
# else:
#     answer = answer + 'T'
# print(answer)
```

ANSWER:

```
For 2
PS D:\python> python 1.py
T
For 20
PS D:\python> python 1.py
I
For 11
PS D:\python> python 1.py
Mi
```

##

############## YOU TRY IT ###############

```
# Write a program that:
# * Saves a secret number.
# * Asks the user for a number guess.
# * Prints whether the guess is too low, too high, or the same as the secret.

# your code here
secret = 7
guess = int(input("Guess a number between 0 and 10: "))
if guess == secret:
   print("You are correct.")
elif guess < secret:
   print("Your guess is too low.")
else:
   print("Your guess is too high.")
```

##

##
############## END LECTURE ##########################
##

##
############## AT HOME ##################
##

 # Practice 1: What is the value of s1 and s2?

```
>>> s1 = "a" + "b"
>>>
>>> d = "hi"
```

```
>>> e = " ana"
>>> s2 = d + 2*e
>>> s1
'ab'
>>> s2
'hi ana ana'
>>>
```

 # Practice 2: What are the substrings of s?

```
>>> s = "ABC d3f ghi"
>>> s[0:3:1]
'ABC'
>>> s[0:4]
'ABC '
>>> s[8:len(s):3]
'g'
>>> s[2::-1]
'CBA'
>>>
```

##
############### END AT HOME ##########################
##

##
############### ANSWERS TO LECTURE ##########################
##

 # You Try It 1: Write a program that:
 # * Asks the user for a verb.
 # * Prints "I can _ better than you" where you replace _ with the verb.
 # * Then prints the verb 5 times in a row separated by spaces.
 # For example, if the user enters run, you print:
 # I can run better than you!
 # run run run run run

```
# your code here
# verb = input("Type in a verb: ")
# print("I can", verb, "better than you!")
# print((verb+" ")*4+verb)
```

 # You Try It 2: Write a program that:
 # * Saves a secret number.
 # * Asks the user for a number guess.
 # * Prints a bool depending on whether the guess matches the secret.

```
# your code here
```

```
# secret = 7
# guess = int(input("Guess a number between 0 and 10: "))
# print(secret == guess)


# You Try It 3: Buggy, fix it!
# x = int(input("Enter a number for x: "))
# y = int(input("Enter a different number for y: "))
# if x == y:
#     print(x,"is the same as",y)
# print("These are equal!")

# Fixed:
# x = int(input("Enter a number for x: "))
# y = int(input("Enter a different number for y: "))
# if x == y:
#     print(x,"and",y)
#     print("These are equal!")


# You Try It 4: Write a program that:
# * Saves a secret number.
# * Asks the user for a number guess.
# * Prints whether the guess is too low, too high, or the same as the secret.

# your code here
# secret = 7
# guess = int(input("Guess a number between 0 and 10: "))
# if guess == secret:
#     print("You are correct.")
# elif guess < secret:
#     print("Your guess is too low.")
# else:
#     print("Your guess is too high.")

##########################################
############### END ANSWERS TO LECTURE ###########################
##########################################
```