
# PYTHON FOR COMPUTATIONAL PROBLEM SOLVING

## QUIZ: Unit - 3

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## QUIZ

Which of the following is true about recursion in Python?

a) Recursive functions must always have a base case.
b) Recursive functions cannot call themselves.
c) Python limits recursion depth by default.
d) A and C

Answer: d) A and C

```
import sys
sys.getrecursionlimit() # To view the current limit
sys.setrecursionlimit(n) # To set a new limit (n must be a positive integer)
```

By default, the recursion limit is set to 1000 in most Python installations, but this can vary depending on the environment.

## QUIZ

What will be the output of the following code?

```
def outerfunc(x):
    def innerfunc():
        print(x)
    return innerfunc
myfunc = outerfunc(7)
myfunc()
```

a) 7
b) Error
c) None
d) 0

Answer: a) 7

## QUIZ

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A closure is created when:

a) A function is defined within another function.
b) A nested function references a variable from its enclosing scope and the nesting function returns the nested function.
c) A function does not use any global variables.
d) The inner function is never called.

Answer: b) A nested function references a variable from its enclosing scope and the nesting function returns the nested function.

## QUIZ


What is the correct way to apply a decorator to a function in Python?

a) def function_name() @decorator
b) @decorator def function_name()
c) decorator(function_name())
d) decorator@function_name

Answer: b) @decorator def function_name()

## QUIZ

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Which statement about Python generators is correct?

a) Generators use return to yield values.
b) Generators maintain state between calls.
c) Generators cannot be used with loops.
d) Generators do not support iteration.

Answer: b) Generators maintain state between calls.

## QUIZ

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What is the key difference between closures and decorators?

a) Closures are anonymous, while decorators have names.
b) Decorators modify functions, while closures capture the enclosing scope.
c) No difference. Both are same
d) Closures are only used in recursion.

Answer: b) Decorators modify functions, while closures capture the enclosing scope.

## QUIZ

Which of the following functions correctly defines a generator?

```
def generator_example():
    yield 1
    yield 2
```

a) generator_example() is a generator function.
b) generator_example() does not return a generator object.
c) generator_example() cannot yield multiple values.
d) Generators cannot use yield.

Answer: a) generator_example() is a generator function.

## QUIZ

Choose the code for which the output is as below:
before
in f1
After

a)
```
def deco(fn):
    def inner():
        print("before")
        fn()
        print("after")
    return inner
@deco
def f1():
    print("in f1")
f1()
```

b)
```
def deco(fn):
    def inner():
        print("before")
        print("after")
    return inner
@deco
def f1():
    print("in f1")
f1()
```

c)
```
def deco(fn):
    print("before")
    fn()
    print("after")
@deco
def f1():
    print("in f1")
f1()
```

d)
```
def deco(fn):
    def inner():
        print("in f1")
    return inner
@deco
def f1():
    print("before")
    f1()
    print("after")
f1()
```

Answer: a)

## QUIZ

The output of the following code is:
[10, 20]
Which code produces the above output?

a)
```
def my_gen():
    yield 10
    yield 20
    yield 30
gen = my_gen()
output = [next(gen) for _ in range(2)]
```

Answer: a)

b)
```
def my_gen():
    yield 10
    yield 20
    yield 30
gen = my_gen()
output = [next(gen) for _ in range(3)]
```

c)
```
def my_gen():
    yield 20
    yield 10
    yield 30
gen = my_gen()
output = [next(gen) for _ in range(2)]
```

## QUIZ


Which Python statement is used to create a generator function that produces values on demand?

a) while True
b) yield from
c) continue
d) yield

Answer: d) yield

## QUIZ

Which of the following code snippets will produce this output?

```
1
2
3
4
5
```

a)

```
def print_numbers(n):
    if n > 6:
        return
    print_numbers(n + 1)
print_numbers(2)
```

b)

```
def print_numbers():
    for i in range(6):
        print(i)
print_numbers()
```

c)

```
def recursive_print(n):
    if n == 4:
        return
    print(n)
    recursive_print(n + 1)
recursive_print(2)
```

d)

```
for i in range(1,6):
    print(i)
```

Answer: d)

## QUIZ

What will be the output of the following code?

```
def decorator(func):
    def wrapper():
        print("Before function call", end =  " ")
        func()
        print("After function call")
    return wrapper
@decorator
def greet():
    print("Hello!", end = " ")
greet()
```

a) Before function call, Hello!, After function call
b) Hello!, Before function call, After function call
c) Before function call, After function call, Hello!
d) Error

Answer: a) Before function call, Hello!, After function call

## QUIZ

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Which statement about Python generators is false?

a) Generators produce values only when requested.
b) Generators automatically restart after completion.
c) Generators use yield instead of return.
d) Generators can be used to handle large datasets efficiently.

Answer: b) Generators automatically restart after completion.

## QUIZ

What will be the output of the following code?

```
def deco_x(fn):
    def wrapper():
        print("X")
        fn()
        print("X")
    return wrapper
def deco_y(fn):
    def wrapper():
        print("Y")
        fn()
        print("Y")
    return wrapper
```

```
@deco_x
@deco_y
def greet():
    print("Hello")
greet()
```

a) X, Y, Hello, Y, X
b) Y, X, Hello, X, Y
c) X, Hello, Y, X
d) Error

Answer:
a) X, Y, Hello, Y, X

## QUIZ

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What is the correct way to change the background color of a Tkinter button to red color?

a) button.color("red")

b) button.config(bg="red")

c) button.change_color("red")

d) button.set_bg("red")

Answer: b) button.config(bg="red")

## QUIZ

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What will happen if grid() and pack() geometry managers are used on the same widget?

a) The widget will be displayed twice.
b) Tkinter will raise an error.
c) Only grid() will take effect.
d) Only pack() will take effect.

Answer: b) Tkinter will raise an error.

## QUIZ

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In a complex Tkinter GUI, which geometry manager would be ideal for creating a dynamic, resizable layout?

a) pack
b) grid
c) place
d) Fit

Answer: b) grid

## QUIZ

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Which of the following correctly describes the steps for creating a basic GUI using Tkinter in Python?

a) Import Tkinter, create a main window object using Tk(), add widgets, and use mainloop() to run the application.
b) Create the main window object using Tk(), add widgets, and use loop() to run the application.
c) Import Tkinter, create widgets, then call run() to execute the GUI.
d) Import Tkinter, create widgets in the __init__ method, and call start() to initiate the GUI application.

Answer:
a) Import Tkinter, create a main window object using Tk(), add widgets, and use mainloop() to run the application.

## QUIZ

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What is the default behavior of a Tkinter window when the pack() geometry manager is used?

a) The window remains at a fixed size.
b) The window resizes according to the screen resolution.
c) The window sizes to fit the widgets inside it.
d) Default behavior is not there for pack()

Answer: c) The window sizes to fit the widgets inside it.

## QUIZ

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Which statement about the Button widget's command property is true?

a) command only accepts lambda functions.
b) command can take multiple functions.
c) command should be assigned without parentheses to avoid immediate execution.
d) command is used only for system calls.

Answer: c) command should be assigned without parentheses to avoid immediate execution.

## QUIZ

What will happen if mainloop() is called twice in a Tkinter program?

a) Only the first mainloop() will execute.
b) The program will crash.
c) Tkinter will raise an error.
d) The second mainloop() will override the first.

Answer: c) Tkinter will raise an error.

## QUIZ

Which of the following methods is used to define a fixed size for a window in Tkinter?

a) minsize()
b) geometry()
c) maxsize()
d) size()

Answer: b) geometry()

## QUIZ

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What does the destroy() method do in Tkinter?

a) It closes the application and all open windows.
b) It minimizes the window.
c) It stops the main loop of the application.
d) It removes a widget or window from the screen.

Answer: d) It removes a widget or window from the screen.

## QUIZ

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What does the mainloop() function do in a Tkinter application?

a) It runs the application in an infinite loop, waiting for user interaction.
b) It initializes the GUI window.
c) It stops the program from executing.
d) It sets up the window's layout.

Answer: a) It runs the application in an infinite loop, waiting for user interaction.

## QUIZ


What type of widget is used for creating multiple options from which the user can select only one option in the interface usingTkinter?

a) Checkbutton
b) Entry
c) Label
d) Radiobutton

Answer: d) Radiobutton

## QUIZ

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Which of the following is true about the place() geometry manager in Tkinter?

a) It places widgets in a table-like grid.
b) It places widgets based on specific pixel coordinates.
c) It automatically resizes widgets.
d) It arranges widgets vertically.

Answer: b) It places widgets based on specific pixel coordinates.

## QUIZ

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What does the get() method do for a Tkinter Entry widget?

a) Sets the value of the widget.
b) Retrieves the value entered by the user.
c) Clears the widget's contents.
d) Configures the widget's font.

Answer: b) Retrieves the value entered by the user.

## QUIZ

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What would the command root.geometry("200x100") do in a Tkinter application where root is the name of the window created?

a) Resizes the root window to 200x100 pixels.
b) Sets the root window's title to "200x100".
c) Adds a 200x100 sized frame to the window.
d) Moves the window to coordinates (200, 100).

Answer: a) Resizes the root window to 200x100 pixels.

## QUIZ

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What is the purpose of the Tkinter.Frame widget?

a) It draws a border around widgets.
b) It holds and organizes other widgets into a rectangular area.
c) It creates a new window.
d) It is used to display images.

Answer: b) It holds and organizes other widgets into a rectangular area.

## QUIZ

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Which of the following is the correct way to create a button in Tkinter where window is the name of the window created using Tk()?

a) Button(window, text="Click Me")
b) Button(text="Click Me", window)
c) CreateButton(window, "Click Me")
d) Button("Click Me", window)

Answer: a) Button(window, text="Click Me")

## QUIZ


What is the purpose of the -m option in the python -m doctest command?

a) It runs the doctest on the specified file and checks if the code examples in docstrings pass.
b) It runs doctest on a specific module within the Python standard library.
c) It imports the module and runs tests automatically from the module's docstring.
d) It runs the entire module as a script without checking the docstrings.

Answer: a) It runs the doctest on the specified file and checks if the code examples in docstrings pass.

## QUIZ

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In Pytest, what does the -k option do?

a) Runs tests in a specific module.
b) Filters tests by keyword.
c) Skips tests.
d) Marks tests for detailed output.

Answer: b) Filters tests by keyword.

## QUIZ


Which of the following commands will list all available debugger commands in pdb?

a) help
b) dir
c) commands
d) List

Answer: a) help

## QUIZ


Which of the following is a valid way to check if a test function is passed or failed in pytest?

a) assert condition
b) assertEquals(value1, value2)
c) assertTrue(condition)
d) verify(condition)

Answer: a) assert condition

## QUIZ

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What command would you use in pdb to continue execution until the next breakpoint?

a) run
b) next
c) step
d) continue

Answer: d) continue

## QUIZ

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What is the purpose of the breakpoint() function in Python?

a) It allows the program to run faster by skipping certain lines of code.
b) It creates a temporary breakpoint in the code that will be automatically removed after execution.
c) It is used to pause the execution of the program and enter the Python Debugger (PDB) at the point where the function is called.
d) It sets a breakpoint that can only be triggered when a specific error occurs.

Answer: c) It is used to pause the execution of the program and enter the Python Debugger (PDB) at the point where the function is called.

## QUIZ


Which of the following Pytest commands will provide detailed test result information, including variable values?

a) pytest -x
b) pytest -s
c) pytest --tb=short
d) pytest –v

Answer: d) pytest -v

## QUIZ

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What does the next command do in the Python Debugger (PDB)?

a) It moves the execution to the next statement within the current function, skipping over any function calls.
b) It steps into the next function call, pausing at the first line of the called function.
c) It moves to the next line in the program, including lines that are part of function calls.
d) It exits the current function and returns to the previous function in the call stack.

Answer: a) It moves the execution to the next statement within the current function, skipping over any function calls.

## QUIZ


What does the step command do in the Python Debugger (PDB)?

a) It steps into the next line of code, whether it is within the current function or a new function being called.
b) It steps over the current line of code and proceeds to the next line in the same function.
c) It exits the current function and stops at the caller's function.
d) It steps through the code without pausing, executing the current function in one go.

Answer: a) It steps into the next line of code, whether it is within the current function or a new function being called.

## QUIZ


Which of the following is a valid Python module name if it has to be imported in another module?

a) 123_module.py
b) _module1.py
c) 1module.py
d) @module.py

Answer: b) _module1.py

## QUIZ

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What happens when a module is imported for the first time in Python?

a) The module is compiled into bytecode and stored in __pycache__.
b) Python checks the syntax of the code and runs it immediately.
c) Python creates a copy of the module in memory.
d) The module is ignored if it has been previously imported.

Answer: a) The module is compiled into bytecode and stored in __pycache__.

## QUIZ

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How can you make a module available with an alias in Python?

a) import alias module
b) alias module import
c) module as alias import
d) import module as alias

Answer: d) import module as alias

## QUIZ

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What is the purpose of the reload() function in Python's importlib module?

a) To reload the current Python interpreter.
b) To reload a module and apply any changes made to it.
c) To reload a specific function from a module.
d) To reload the Python script after saving changes.

Answer: b) To reload a module and apply any changes made to it.

## QUIZ

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What does the sys.path list in Python contain?

a) List of directories where Python will search for modules.
b) List of all imported modules in the current session.
c) List of all system-level variables.
d) List of all files in the current directory.

Answer: a) List of directories where Python will search for modules.

## QUIZ

How can you modify the sys.path to include a new directory during runtime?

a) Use sys.append('new_directory’)
b) Use sys.add('new_directory’)
c) Use sys.path.append('new_directory’)
d) Use sys.path.insert('new_directory')

Answer: c) Use sys.path.append('new_directory')

## QUIZ

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What are the different ways in which import statement can be used?

a) import module_name

b) from module_name import entity1, entity2

c) import module_name as alias

d) from module_name import *

e) All of these

Answer: e) All of these

## QUIZ

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What is the use of the if __name__ == "__main__": block in a module?

A) To run the module as a standalone script.

B) To prevent the module from being imported.

C) To define a module's global variables.

D) To execute code only once during import.

Answer:

A) To run the module as a standalone script.

## QUIZ

Find the output:

```
from module1 import *
from module2 import *
print(f1())
print(f2())
```

**module1.py**

```
def f1():
    return 1
def f2():
    return 2
```

**module2.py**

```
def f2():
    return 3
```

Answer:
1
3

## QUIZ

What will be the output of the following Python code?

```
#mod1.py
def change(a):
    b=[x*2 for x in a]
    print(b)
#mod2.py
def change(a):
    b=[x*x for x in a]
    print(b)
from mod1 import change
from mod2 import change
#main
s=[1,2,3]
change(s)
```

Answer: [1 , 4, 9 ]


# THANK YOU

If any queries, contact **sindhurpai@pes.edu**

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