

GLS UNIVERSITY
Faculty of Computer Applications & IT
Integrated MCA

221601506 Practicals on Python

Practical Assignment Unit – 3
(16th August, 2024 to 23rd August, 2024)

1. Create a function `calculate_area` (`length`, `width=5`) that returns the area of a rectangle. If the width is not provided, it should default to 5.
2. Write a function `sum_all(*numbers)` that takes any number of numerical arguments and returns their sum.
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4. Create a module `operations.py` with functions for arithmetic operations (add, subtract, multiply, divide). Import this module in another script and use its functions. Take numbers as user inputs and pass in module functions.
5. Write a lambda function that takes two arguments and returns their product. Use this lambda function with the `map()` function to multiply elements of two lists together.
6. Write a Python function `sum_and_product(numbers)` that takes a list of numbers as input and returns a tuple containing two values: The sum of all the numbers in the list. The product of all the numbers in the list.
7. Write a function `find_max(*args)` that accepts any number of positional arguments and returns the maximum value. Use argument unpacking to test your function with a list of numbers.
8. Write a function `outer_function(text)` that defines a nested function `inner_function()` which prints the reversed version of text. The `outer_function` should call `inner_function` and return its result.
9. Write a function `apply_operation(a, b, operation)` where `operation` is a function (like add, subtract, etc.). The `apply_operation` function should return the result of applying operation to `a` and `b`.
10. Write a function `calculate_discount(price, discount=0.10, *, tax_rate)` that calculates the final price after applying a discount and a tax. The tax rate is a required keyword argument.
11. Write a Python script that uses the `random` package to simulate the rolling of two six-sided dice.
12. Write a program that generate two random numbers. If the total of the two dices is 7 or 11, print "You win!". Otherwise, print "Try again!".

13. Write a program for following. Create a python package “Shapes”. Create modules:

circle.py: This module should have a function `area(radius)` that calculates and returns the area of a circle given its radius.

rectangle.py: This module should have a function `area(length, width)` that calculates and returns the area of a rectangle given its length and width.

Once the package is created, write a script that imports these modules and calculates:

The area of a circle with radius entered by user

The area of a rectangle with length and width entered by user.

14. Create a package named `geometry` with two sub-packages:

- **2d_shapes:** This sub-package should contain modules for calculating the perimeter of 2D shapes. It should have:
 - `circle.py`: Function `perimeter(radius)` to calculate the perimeter of a circle.
 - `square.py`: Function `perimeter(side)` to calculate the perimeter of a square.
- **3d_shapes:** This sub-package should contain modules for calculating the surface area of 3D shapes. It should have:
 - `sphere.py`: Function `surface_area(radius)` to calculate the surface area of a sphere.
 - `cube.py`: Function `surface_area(side)` to calculate the surface area of a cube.

Write a script that imports these functions and calculates:

1. The perimeter of a circle with radius 4.
2. The surface area of a cube with side length 3.

Upload the submissions here: <https://forms.gle/icQBVmEjVF16z4heA>