

 Marwadi University <small>Marwadi Chandarana Group</small>	NAAC  A+	Marwadi University Faculty of Engineering & Technology Department of Information and Communication Technology
Subject: Programming With Python (01CT1309)	Aim: Write a python program to define a module and import a specific function in that module to another program	
Experiment No: 08	Date:	Enrollment No: 92400133055

[GITHUB](#)

Aim: Write a python program to define a module and import a specific function in that module to another program

IDE:

Python Modules

As our program grows bigger, it may contain many lines of code. Instead of putting everything in a single file, we can use modules to separate codes in separate files as per their functionality. This makes our code organized and easier to maintain.

Module is a file that contains code to perform a specific task. A module may contain variables, functions, classes etc. Let's see an example,

Let us create a module. Type the following and save it as example.py

```
def add(a,b):
    result = a+b
    return result

import example as addition

a = addition.add(4,5)

print(a)
```

Output



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```
1 import operation as addition
2 x=int(input("Enter x"))
3 y=int(input("Enter y"))
4 result = addition.add(x,y)
5 print("After additon: ",result)
```

PROBLEMS **2**

OUTPUT

DEBUG CONSOLE

TERMINAL

PORTS

PS E:\SEM 3\PWP> python -u "e:\SEM 3\PWP\Class Tutorials\lab_8.py"

- Enter x5
- Enter y6
- After additon: 11

Import Python Standard Library Modules

The Python standard library contains well over 200 modules. We can import a module according to our needs. Suppose we want to get the value of pi, first we import the math module and use math.pi. For example,

```
#import standard math module

import math

# use math.pi to get value of pi

print("The value of pi is", math.pi)
```

Output



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```

7  #import standard math module
8  import math
9  # use math.pi to get value of pi
10 print("The value of pi is", math.pi)

```

PROBLEMS **2**

OUTPUT

DEBUG CONSOLE

TERMINAL

PORTS

PS E:\SEM 3\PWP> **python -u "e:\SEM 3\PWP\Class Tutorials\lab_8.py"**

- The value of pi is 3.141592653589793
- PS E:\SEM 3\PWP>

Python import with Renaming

In Python, we can also import a module by renaming it. For example,

import module by renaming it

import math as m

print(m.pi)

Output

Python from...import statement

We can import specific names from a module without importing the module as a whole. For example,

import only pi from math module

from math import pi

print(pi)

Output

```

1 # import only pi from math module
2 from math import pi
3 print(pi)

```

3.141592653589793

==> Code Execution Successful ==>



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Import all names

In Python, we can import all names(definitions) from a module using the following construct:

```
# import all names from the standard module math  
  
from math import *  
  
print("The value of pi is", pi)
```

Output

```
19 # import all names from the standard module math  
20 from math import *  
21 print("The value of pi is", pi)
```

PROBLEMS **2**

OUTPUT

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TERMINAL

PORTS

PS E:\SEM 3\PWP> **python -u "e:\SEM 3\PWP\Class Tutorials\lab_8.py"**

- The value of pi is 3.141592653589793
- PS E:\SEM 3\PWP>

The dir() built-in function

In Python, we can use the dir() function to list all the function names in a module.

We can use dir in math module in the following way:

```
print(dir(math))
```

Output



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```
23 import math
24 print(dir(math))
```

PROBLEMS 2 OUTPUT DEBUG CONSOLE TERMINAL PORTS Σ Code + √ ☰ ⌂ … | [] ×

```
PS E:\SEM 3\PWP> python -u "e:\SEM 3\PWP\Class Tutorials\lab_8.py"
● ['__doc__', '__loader__', '__name__', '__package__', '__spec__', 'acos', 'acosh', 'asin', 'asinh', 'atan',
, 'atan2', 'atanh', 'ceil', 'comb', 'copysign', 'cos', 'cosh', 'degrees', 'dist', 'e', 'erf', 'erfc', 'exp',
, 'expm1', 'fabs', 'factorial', 'floor', 'fmod', 'frexp', 'fsum', 'gamma', 'gcd', 'hypot', 'inf', 'isclose',
, 'isfinite', 'isinf', 'isnan', 'isqrt', 'ldexp', 'lgamma', 'log', 'log10', 'log1p', 'log2', 'modf',
, 'nan', 'perm', 'pi', 'pow', 'prod', 'radians', 'remainder', 'sin', 'sinh', 'sqrt', 'tan', 'tanh', 'tau',
, 'trunc']
```

○ PS E:\SEM 3\PWP>

Built-in modules

Some examples of Python built-in modules include “os”, “sys”, “math”, and “datetime”.

```
help('modules')
```

Output:



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27 `help('modules')`

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_abc	asyncio	keyword	re
_ast	asyncore	kiwisolver	reprlib
_asyncio	atexit	lab_1	rlcompleter
_bisect	audioop	lab_2	runpy
_blake2	base64	lab_3	sched
_bootlocale	basics	lab_4	secrets
_bz2	bdb	lab_5	select
_codecs	binascii	lab_6	selectors
_codecs_cn	binhex	lab_7	setuptools
_codecs_hk	bisect	lab_8	shelve
_codecs_iso2022	builtins	lab_9	shlex
_codecs_jp	bz2	lib2to3	shutil
_codecs_kr	cProfile	linecache	signal
_codecs_tw	cal	locale	simple_app
_collections	calendar	logging	site
_collections_abc	cgi	lzma	six

Let's find the area of the circle

$$a = \pi r^2$$

Python Code



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```
33 import math  
34 r=5  
35 print((math.pi)*r*r)
```

PROBLEMS 2

OUTPUT

DEBUG CONSOLE

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PORTS

PS E:\SEM 3\PWP> python -u "e:\SEM 3\PWP\Class Tutorials\lab_8.py"

- 78.53981633974483
- PS E:\SEM 3\PWP>

Print the values of positive and negative infinity.

```
import math
```

```
print (math.inf)
```

```
print (-math.inf)
```

Output

```
29 import math  
30 print (math.inf)  
31 print (-math.inf)
```

PROBLEMS 2

OUTPUT

DEBUG CONSOLE

TERMINAL

PORTS

- PS E:\SEM 3\PWP> python -u "e:\SEM 3\PWP\Class Tutorials\lab_8.py"
inf
-inf
- PS E:\SEM 3\PWP>

List of Mathematical function in Math Module

pow(x,y), sqrt(x), trunc(x), cos(x), sin(x), tan(x), degrees(x), radians(x), exp(x), log2(x), log10(x)



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Post Lab Exercise:

- a. Write a Python program to convert degree to radian

```

1 #Question 1
2 import math
3 degree = float(input("Enter degrees: "))
4 radian = math.radians(degree)
5 print(f"{degree} = {radian} radians")

```

PROBLEMS **2** OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
PS E:\SEM 3\PWP> python -u "e:\SEM 3\PWP\Class Tutorials\post_lab_8.py"
Enter degrees: 60
60.0 = 1.0471975511965976 radians
```

- b. Make a simplest possible Python program that calculates and prints the value of the formula

$$y = 6x^2 + 4\sin(x)$$

```

7 #Question 2
8 import math
9 x = float(input("Enter value of x: "))
10 y = 6*(x**2) + 4*math.sin(x)
11 print("y =", y)

```

PROBLEMS **2** OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
PS E:\SEM 3\PWP> python -u "e:\SEM 3\PWP\Class Tutorials\tempCo
▶ Enter value of x: 2
y = 27.637189707302728
▶ PS E:\SEM 3\PWP>
```

- c. Write a Python function that evaluates the mathematical functions



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$$f(x) = \cos(2x), f'(x) = -2 \sin(2x), \text{ and } f''(x) = -4 \cos(2x).$$

Return these three values. Write out the results of these values for $x = \pi$

```
13 #Question 3
14 import math
15 def functions(x):
16     f = math.cos(2*x)
17     f1 = -2 * math.sin(2*x)
18     f2 = -4 * math.cos(2*x)
19     return f, f1, f2
20 x = math.pi
21 f_result, f1_result, f2_result = functions(x)
22
23 print("f(x) =", f_result)
24 print("f'(x) =", f1_result)
25 print("f''(x) =", f2_result)
```

PROBLEMS 2 OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
PS E:\SEM 3\PWP> python -u "e:\SEM 3\PWP\Class Tutorials\post_lab_8.py"
f(x) = 1.0
f'(x) = 4.898587196589413e-16
f''(x) = -4.0
PS E:\SEM 3\PWP>
```