Marwadi University Marwadi Chandarana Group 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:25/08/25**	**Enrollment No:92400133037**

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

```
1  def add(a,b):
2      res=a+b
3      return res
4
```

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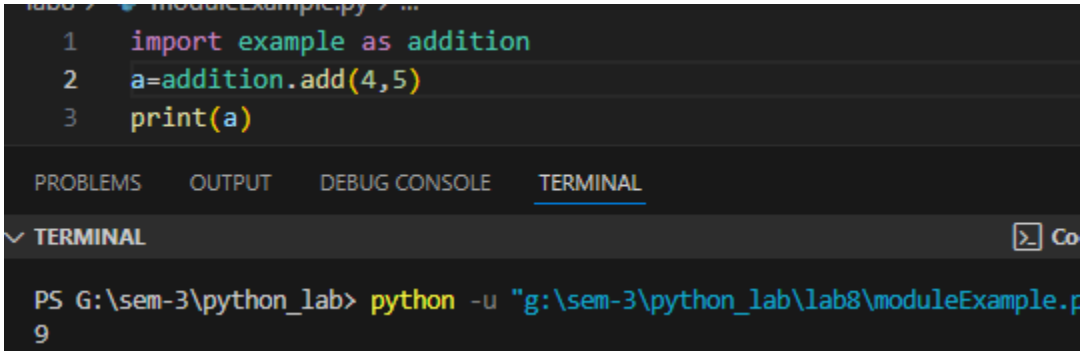

Import Python Standard Library Modules

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)

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)

Python from...import statement

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

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import only pi from math module

from math import pi

print(pi)

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

```
1   import math
2   print("The value of pi is:",math.pi)
3
4   import math as m
5   print(m.pi)
6
7   from math import pi
8   print(pi)
9
10  from math import*
11  print("The value of pi is",pi)
12
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

TERMINAL

```
PS G:\sem-3\python_lab> python -u "g:\sem-3\python_lab\lab8\libraryModule.py"
The value of pi is: 3.141592653589793
3.141592653589793
3.141592653589793
The value of pi is 3.141592653589793
```

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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

```
12
13  print(dir(math))
```

```
TERMINAL                                                    Code
['__doc__', '__loader__', '__name__', '__package__', '__spec__', 'acos', 'acosh', 'asin', 'asinh', 'atan', 'atan2', 'atanh', 'cbrt', 'ceil', 'comb',
'copysign', 'cos', 'cosh', 'degrees', 'dist', 'e', 'erf', 'erfc', 'exp', 'exp2', 'expm1', 'fabs', 'factorial', 'floor', 'fmod', 'frexp', 'fsum', 'gam
ma', 'gcd', 'hypot', 'inf', 'isclose', 'isfinite', 'isinf', 'isnan', 'isqrt', 'lcm', 'ldexp', 'lgamma', 'log', 'log10', 'log1p', 'log2', 'modf', 'nan
', 'nextafter', 'perm', 'pi', 'pow', 'prod', 'radians', 'remainder', 'sin', 'sinh', 'sqrt', 'sumprod', 'tan', 'tanh', 'tau', 'trunc', 'ulp']
```

Built-in modules

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

help('modules')

Output:

```
14  help('modules')
15
```

```
Please wait a moment while I gather a list of all available modules...

PostLab         _typing          glob            runpy
__future__      _uuid            graphlib        sched
__hello__       _warnings        gzip            secrets
__phello__      _weakref         hashlib         select
_abc            _weakrefset      heapq           selectors
_aix_support    _winapi          hmac            shelve
_ast            _wmi             html            shlex
_asyncio        _xxinterpchannels http           shutil
_bisect         _xxsubinterpreters idlelib       signal
_blake2         _zoneinfo        imaplib         site
_bz2            abc              imghdr          six
```

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```
_codecs             aifc                importlib           smtplib
_codecs_cn          antigravity         inspect             sndhdr
_codecs_hk          argparse            io                  socket
_codecs_iso2022     array               ipaddress           socketserver
_codecs_jp          ast                 itertools           sqlite3
_codecs_kr          asyncio             json                sre_compile
_codecs_tw          atexit              keyword             sre_constants
_collections        audioop             lib2to3             sre_parse
_collections_abc    base64              libraryModule       ssl
_compat_pickle      bdb                 linecache           stat
_compression        binascii            locale              statistics
_contextvars        bisect              logging             string
_csv                builtins            lzma                stringprep
_ctypes             bz2                 mailbox             struct
_datetime           cProfile            mailcap             subprocess
_decimal            calendar            marshal             sunau
_elementtree        cgi                 math                symtable
_functools          cgitb               mimetypes           sys
```



```
_hashlib            chunk               mmap                sysconfig
_heapq              cmath               moduleExample       tabnanny
_imp                cmd                 modulefinder        tarfile
_io                 code                msilib              telnetlib
_json               codecs              msvcrt              tempfile
_locale             codeop              multiprocessing     textwrap
_lsprof             collections         netrc               this
_lzma               colorsys            nntplib             threading
_markupbase         compileall          nt                  time
_md5                concurrent          ntpath              timeit
_msi                configparser        nturl2path          tkinter
_multibytecodec     contextlib          numbers             token
_multiprocessing    contextvars         numpy               tokenize
_opcode             copy                opcode              tomllib
_operator           copyreg             operator            trace
_osx_support        crypt               optparse            traceback
_overlapped         csv                 os                  tracemalloc
_pickle             ctypes              pandas              tty
```

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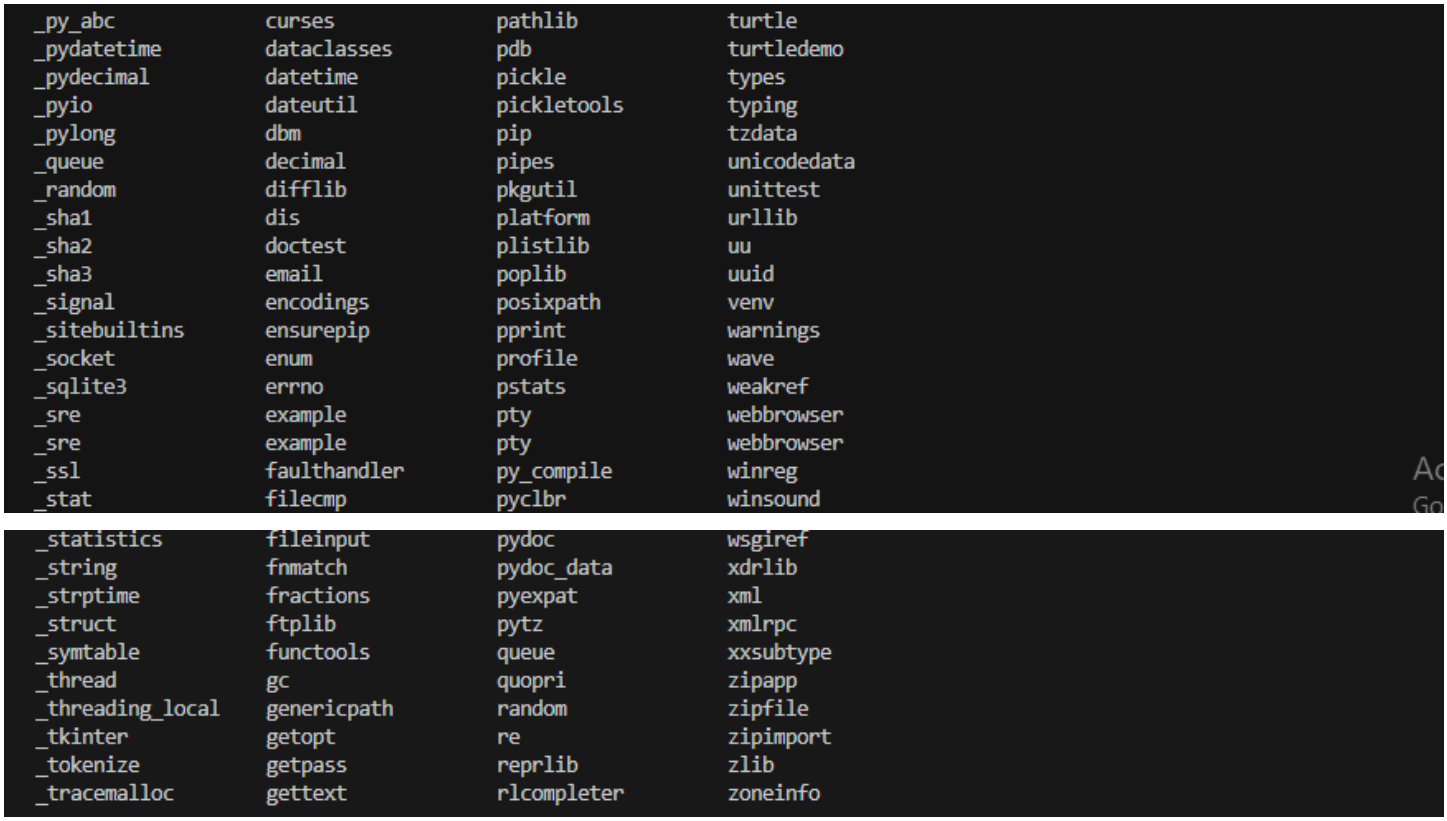

```
_py_abc          curses          pathlib          turtle
_pydatetime      dataclasses     pdb              turtledemo
_pydecimal       datetime        pickle           types
_pyio            dateutil        pickletools      typing
_pylong          dbm             pip              tzdata
_queue           decimal         pipes            unicodedata
_random          difflib         pkgutil          unittest
_sha1            dis             platform         urllib
_sha2            doctest         plistlib         uu
_sha3            email           poplib           uuid
_signal          encodings       posixpath        venv
_sitebuiltins    ensurepip       pprint           warnings
_socket          enum            profile          wave
_sqlite3         errno           pstats           weakref
_sre             example         pty              webbrowser
_sre             example         pty              webbrowser
_ssl             faulthandler    py_compile       winreg
_stat            filecmp         pyclbr           winsound
_statistics      fileinput       pydoc            wsgiref
_string          fnmatch         pydoc_data       xdrlib
_strptime        fractions       pyexpat          xml
_struct          ftplib          pytz             xmlrpc
_symtable        functools       queue            xxsubtype
_thread          gc              quopri           zipapp
_threading_local genericpath     random           zipfile
_tkinter         getopt          re               zipimport
_tokenize        getpass         reprlib          zlib
_tracemalloc     gettext         rlcompleter      zoneinfo
```

Let's find the area of the circle

$$a = \pi r^2$$

Python Code

Print the values of positive and negative infinity.

```
import math

print (math.inf)

print (-math.inf)
```

Output

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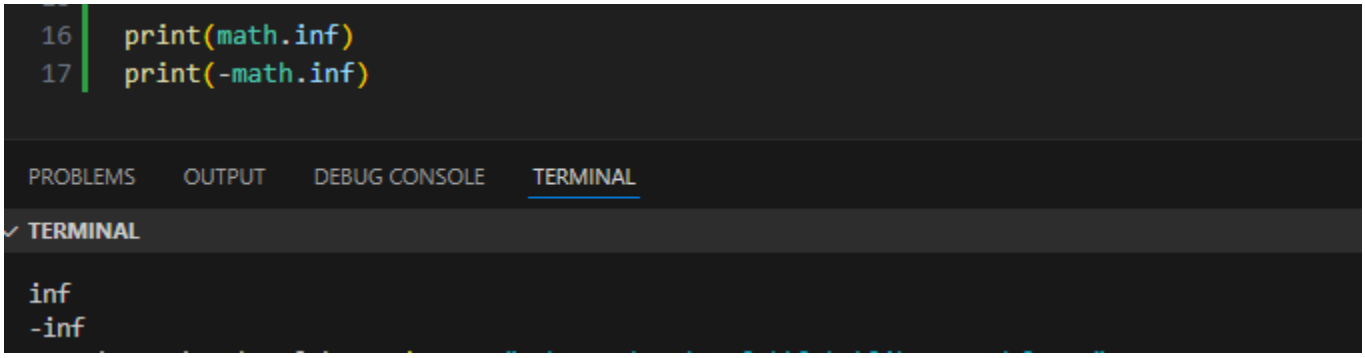

List of Mathematical function in Math Module

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

Post Lab Exercise:

a. Write a Python program to convert degree to radian
b. Make a simplest possible Python program that calculates and prints the value of the formula

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

c. Write a Python function that evaluates the mathematical functions

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

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

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lab8 > PostLab.py > fn

```python
#a. Write a Python program to convert degree to radian
import math
degree=float(input("Enter the angle in degrees:"))
radian=degree*(math.pi/180)
print(f"{degree} degrees={radian} radians")

#b. Simplest Program for y = 6x² + 4sin(x)
x = float(input("Enter value of x: "))
y=6*(x**2)+4*math.sin(x)
print("y=",y)

#c. Write a Python function that evaluates the mathematical functions f(x) = cos(2x),f'(x) = −2sin(2x), and f'
def fn(x):
    f=math.cos(2*x)
    f1=(int)(-2*math.sin(2*x))
    f2=-4*math.cos(2*x)
    return f,f1,f2
x=math.pi
f,f1,f2=fn(x)
print("f(x)=",f)
print("f'(x)=",f1)
print("f''(x)=",f2)
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

TERMINAL

```
PS G:\sem-3\python_lab> python -u "g:\sem-3\python_lab\lab8\PostLab.py"
Enter the angle in degrees:30
30.0 degrees=0.5235987755982988 radians
Enter value of x: 4
y= 92.9727900187683
f(x)= 1.0
f'(x)= 0
y= 92.9727900187683
f(x)= 1.0
f'(x)= 0
f'(x)= 0
f''(x)= -4.0
```

GITHUB LINK

https://github.com/Heer972005/Python_Lab