Ex.No:11 **NAME:S.RITHUPRIYA**

Date:24.10.24 **ROLL NO:231901043**

ARITHMETIC OPERATIONS USING RPC

AIM:

To Develop a simple calculator using XMLRPC .

ALGORITHM:

Server.py

1. Import XMLRPCServer package
2. Define functions for addition, subtraction, multiplication, division and modulus
3. Initialize simple XMLRPCServer with IP address (or localhost) and port number
4. Register the functions add, sub, mul, div and mod with the server
5. Handle the request
6. Close the connection

Client.py

1. Import XMLRPC Client package
2. Define functions for addition, subtraction, multiplication, division and modulus
3. Initialize simple XMLRPC Client with Server IP address (or localhost) and port number
4. Get two numbers a and b for arithmetic operations
5. Call add() function and print the result
6. Call sub() function and print the result
7. Call mul() function and print the result
8. Call div() function and print the result
9. Call mod() function and print the result
10. Close the connection

CODE:

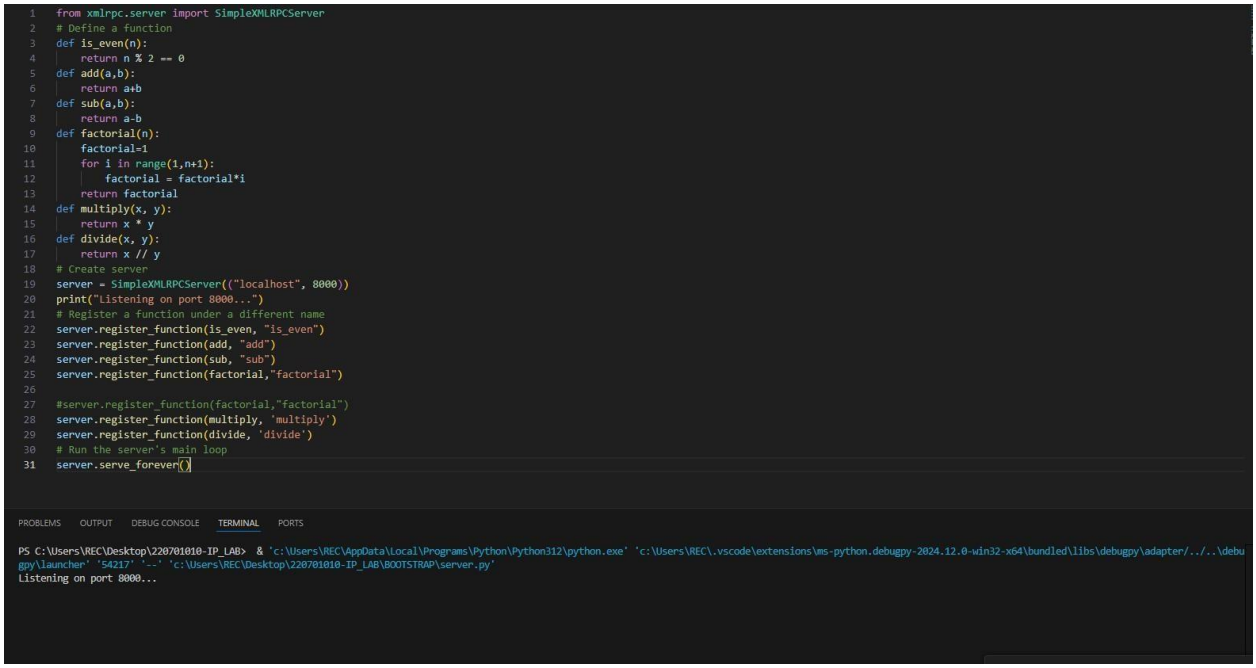
Server.py

```
XML RPC PROGRAM- SERVER SIDE:  from
xmlrpc.server import SimpleXMLRPCServer
# Define a function
def is_even(n):
return n % 2 == 0
```

```
def add(a,b): return
a+b def sub(a,b):
return ab def
factorial(n):
factorial=1
for i in range(1,n+1):
factorial = factorial*i
return factorial def
multiply(x, y):  return
x * y def divide(x,
y):
return x // y
# Create server
server = SimpleXMLRPCServer(("localhost", 8000))
print("Listening on port 8000...")
# Register a function under a different name
server.register_function(is_even, "is_even")
server.register_function(add, "add")
server.register_function(sub, "sub")
server.register_function(factorial,"factorial")

#server.register_function(factorial,"factorial")
server.register_function(multiply, 'multiply')
server.register_function(divide, 'divide')
# Run the server's main loop server.serve_forever()
```

Output:



```python
from xmlrpc.server import SimpleXMLRPCServer
# Define a function
def is_even(n):
    return n % 2 == 0
def add(a,b):
    return a+b
def sub(a,b):
    return a-b
def factorial(n):
    factorial=1
    for i in range(1,n+1):
        factorial = factorial*i
    return factorial
def multiply(x, y):
    return x * y
def divide(x, y):
    return x // y
# Create server
server = SimpleXMLRPCServer(("localhost", 8000))
print("Listening on port 8000...")
# Register a function under a different name
server.register_function(is_even, "is_even")
server.register_function(add, "add")
server.register_function(sub, "sub")
server.register_function(factorial,"factorial")

#server.register_function(factorial,"factorial")
server.register_function(multiply, 'multiply')
server.register_function(divide, 'divide')
# Run the server's main loop
server.serve_forever()
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

PS C:\Users\REC\Desktop\220701010-IP_LAB> & 'c:\Users\REC\AppData\Local\Programs\Python\Python312\python.exe' 'c:\Users\REC\.vscode\extensions\ms-python.debugpy-2024.12.0-win32-x64\bundled\libs\debugpy\adapter/../..\debugpy\launcher' '54217' '--' 'c:\Users\REC\Desktop\220701010-IP_LAB\BOOTSTRAP\server.py'
Listening on port 8000...
```

Client.py

XML RPC PROGRAM- CLIENT SIDE:

import xmlrpc.client proxy= xmlrpc.client.ServerProxy('http://localhost:8000/') # local server for i in range(5): a=int(input("Enter a number:")) b=int(input("Enter b number:"))
print("%d is even?: %d" % (a, (proxy.is_even(a)))) #access XML-RPC server through proxy
print("addition of given number is %d "%((proxy.add(a,b)))) print("sub of given number is %d "%((proxy.sub(a,b)))) print("factorial: %d" %((proxy.factorial(a)))) print("factorial: %d" %((proxy.factorial(b)))) print(“Multiplication of 2 numbers is %d” %(proxy.multiply(a,b)) print(“Division of 2 numbers is %d” %(proxy.divide(a,b))

Output:

BOOTSTRAP > client.py > ...

```python
import xmlrpc.client

proxy = xmlrpc.client.ServerProxy('http://localhost:8000/')  # local server

for i in range(5):
    a = int(input("Enter a number: "))
    b = int(input("Enter b number: "))

    print("%d is even?: %d" % (a, proxy.is_even(a)))  # access XML-RPC server through proxy
    print("Addition of given numbers is %d" % (proxy.add(a, b)))
    print("Subtraction of given numbers is %d" % (proxy.sub(a, b)))
    print("Factorial of %d is %d" % (a, proxy.factorial(a)))
    print("Factorial of %d is %d" % (b, proxy.factorial(b)))
    print("Multiplication of 2 numbers is %d" % (proxy.multiply(a, b)))
    print("Division of 2 numbers is %d" % (proxy.divide(a, b)))

```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
PS C:\Users\REC\Desktop\220701010-IP_LAB> & 'c:\Users\REC\AppData\Local\Programs\Python\Python312\python.exe' 'c:\Users\REC\.vscode\extensions\ms-python.debugpy-2024.12.0-win32-x64\bundled\libs\debugpy\adapter/../..\debu
gpy\launcher' '54335' '--' 'c:\Users\REC\Desktop\220701010-IP_LAB\BOOTSTRAP\client.py'
Enter a number: 6
Enter b number: 8
6 is even?: 1
Addition of given numbers is 14
Subtraction of given numbers is -2
Factorial of 6 is 720
Factorial of 8 is 40320
Multiplication of 2 numbers is 48
Division of 2 numbers is 0
Enter a number:
```

Result:

A simple calculator was designed using XMLRPC.