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EXP NO:11B ARITHMETIC OPERATION 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

Sample Code for Arithmetic operations using RPC

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 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()
```

XML RPC PROGRAM- SERVER SIDE.py × XML RPC PROGRAM- CLIENT SIDE.py

```
1  from xmlrpc.server import SimpleXMLRPCServer
2  # Define a function
3  def is_even(n): 1 usage
4      return n % 2 == 0
5  def add(a,b): 1 usage
6      return a+b
7  def sub(a,b): 1 usage
8      return a-b
9  def factorial(n): 1 usage
10     factorial=1
11     for i in range(1,n+1):
12         factorial = factorial*i
13     return factorial
14 def multiply(x, y): 1 usage
15     return x * y
16 def divide(x, y): 1 usage
17     return x // y
18 # Create server
19 server = SimpleXMLRPCServer(("localhost", 8000))
20 print("Listening on port 8000...")
21 # Register a function under a different name
22 server.register_function(is_even, name: "is_even")
23 server.register_function(add, name: "add")
24 server.register_function(sub, name: "sub")
25 server.register_function(factorial, name: "factorial")
26 #server.register_function(factorial,"factorial")
27 server.register_function(multiply, name: 'multiply')
28 server.register_function(divide, name: 'divide')
29 # Run the server's main loop
30 server.serve_forever()
31
```

XML RPC PROGRAM- CLIENT SIDE:

import xmlrpc.client

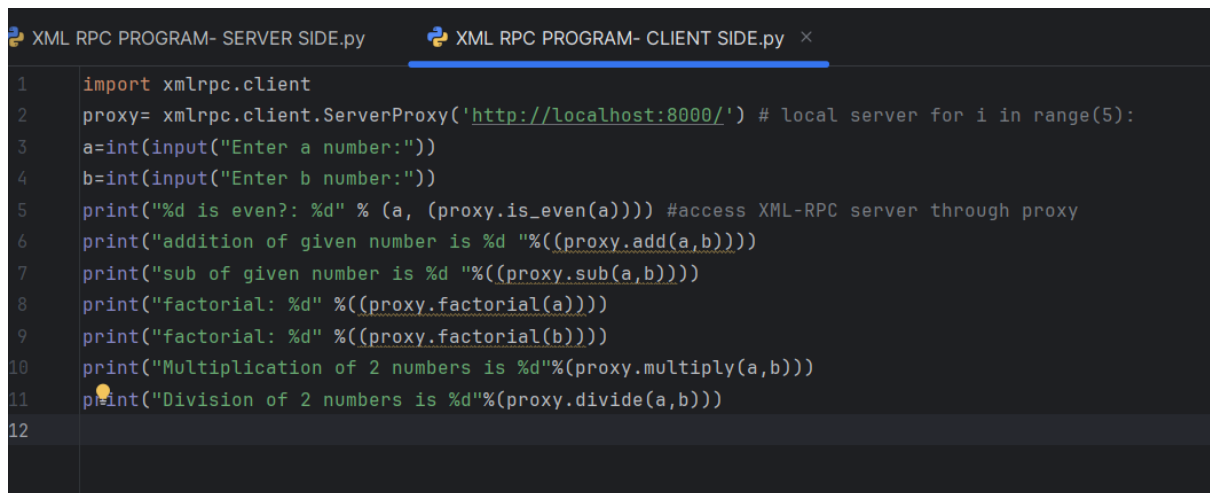
proxy= xmlrpc.client.ServerProxy('http://localhost:8000/') # local server for i in range(5):

```

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)))

```



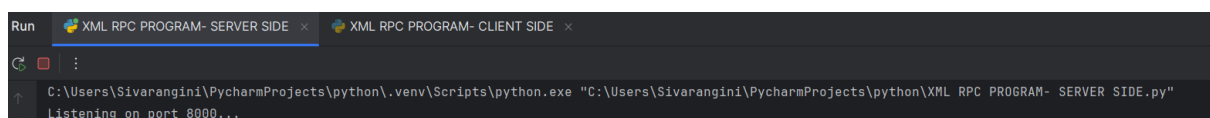
```

XML RPC PROGRAM- SERVER SIDE.py  XML RPC PROGRAM- CLIENT SIDE.py
1  import xmlrpc.client
2  proxy= xmlrpc.client.ServerProxy('http://localhost:8000/') # local server for i in range(5):
3  a=int(input("Enter a number:"))
4  b=int(input("Enter b number:"))
5  print("%d is even?: %d" % (a, (proxy.is_even(a)))) #access XML-RPC server through proxy
6  print("addition of given number is %d "%((proxy.add(a,b))))
7  print("sub of given number is %d "%((proxy.sub(a,b))))
8  print("factorial: %d" %((proxy.factorial(a))))
9  print("factorial: %d" %((proxy.factorial(b))))
10 print("Multiplication of 2 numbers is %d"%(proxy.multiply(a,b)))
11 print("Division of 2 numbers is %d"%(proxy.divide(a,b)))
12

```

OUTPUT:

For server:

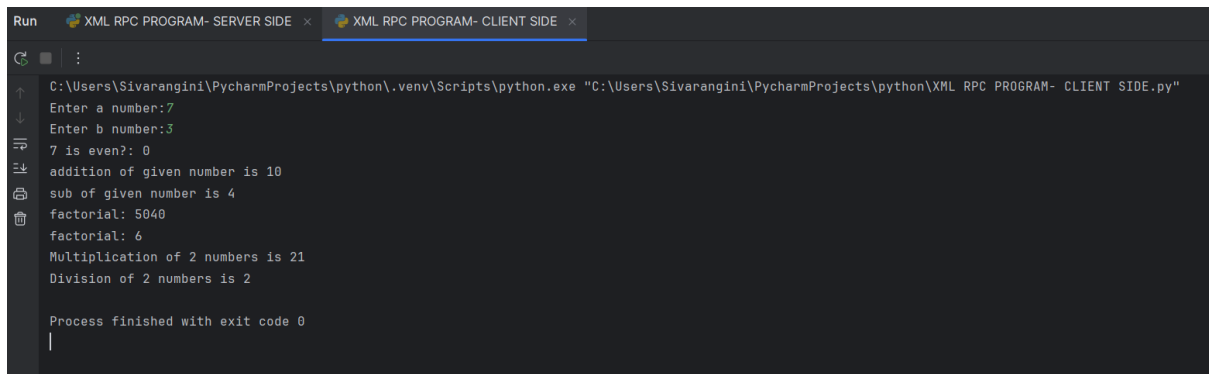


```

Run  XML RPC PROGRAM- SERVER SIDE  XML RPC PROGRAM- CLIENT SIDE
C:\Users\Sivarangini\PycharmProjects\python\venv\Scripts\python.exe "C:\Users\Sivarangini\PycharmProjects\python\XML RPC PROGRAM- SERVER SIDE.py"
Listening on port 8000...

```

For client:



```
Run XML RPC PROGRAM- SERVER SIDE × XML RPC PROGRAM- CLIENT SIDE ×
C:\Users\Sivarangini\PycharmProjects\python\.venv\Scripts\python.exe "C:\Users\Sivarangini\PycharmProjects\python\XML RPC PROGRAM- CLIENT SIDE.py"
Enter a number:7
Enter b number:3
7 is even?: 0
addition of given number is 10
sub of given number is 4
factorial: 5040
factorial: 6
Multiplication of 2 numbers is 21
Division of 2 numbers is 2

Process finished with exit code 0
|
```

RESULT:

A simple calculator was designed using XMLRPC.