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EX NO: 11C
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REMOTE PROCEDURE CALL FOR LIST OPERATIONS-XMLRPC

AIM:

To Implement an XML RPC code for the following functions,

a. No of items in a list

b. Smallest element in a list

c. Largest element in the list

d. Converting a list to a set.

Algorithm:

Here's the algorithm for the XML-RPC server and client operations provided in your code:

Server-Side Algorithm

1. **Define Server Functions**:
    - Define functions to perform the following operations on lists:
        - list_length: Returns the length of a given list.
        - list_maximum: Returns the maximum element in a given list.
        - list_minimum: Returns the minimum element in a given list.
        - list_to_set: Converts a list to a set (removing duplicates) and returns it as a list.
        - list_concate: Concatenates two lists and returns the result.
2. **Initialize XML-RPC Server**:
    - Initialize the server on localhost with port 8000.
3. **Register Functions**:
    - Register each function defined above to make them available to clients.
4. **Start the Server**:
    - Begin listening for client requests using serve_forever.

Client-Side Algorithm

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1. **Initialize XML-RPC Client**:
    - Establish a proxy connection to the XML-RPC server on http://localhost:8000/.
2. **Display Options**:
    - Display options to the user:
        - **Option 1**: Start list operations.
        - **Option 2**: Exit the program.
3. **Input Choice**:
    - Accept the user's choice:
        - If the choice is 2, exit the program.
        - If the choice is 1, proceed with list operations.
4. **Create Lists**:
    - **Input First List**:
        - Prompt the user to enter elements for the first list.
        - Accept integers from the user and append them to list a.
        - Break out of the input loop when the user enters -1.
    - **Input Second List**:
        - Prompt the user to enter elements for the second list.
        - Accept integers from the user and append them to list b.
        - Break out of the input loop when the user enters -2.
5. **Display Lists**:
    - Print the contents of both lists a and b.
6. **Call Server Functions**:
    - Invoke each server function using the proxy:
        - list_length: Pass list a and print the length.
        - list_maximum: Pass list a and print the maximum value.
        - list_minimum: Pass list a and print the minimum value.
        - list_to_set: Pass list a, remove duplicates, and print the result.
        - list_concate: Pass both lists a and b, concatenate them, and print the result.
7. **Repeat or Exit**:
    - Repeat from Step 2 until the user chooses to exit.

Program

Server Side:

```
from xmlrpc.server import SimpleXMLRPCServer
def list_length(a):
  return len(a)
```

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```
def list_maximum(a):
  return max(a)
def list_minimum(a):
  return min(a)
def list_to_set(a):
  f=list(set(a))
  return f
def list_concate(a,b):
  return a+b
server = SimpleXMLRPCServer(("localhost", 8000))
print("Listening on port 8000...")
server.register_function(list_length,"list_length")
server.register_function(list_maximum, "list_maximum")
server.register_function(list_minimum, "list_minimum")
server.register_function(list_to_set, "list_to_set")
server.register_function(list_concate, "list_concate")
server.serve_forever()
```

Client Side:

```
import xmlrpc.client proxy=
xmlrpc.client.ServerProxy('http://localhost:8000/') while
True:
  print("PRESS 1-->STRAT || 2--> STOP ")
  c=int(input("ENTER YOUR CHOICE"))
  a=[]
  b=[] if
  c==1:
     print("ENTER THE ELEMENTS TO ADD FIRST
     LIST") print("PRESS -1 TO EXIT THIS LIST") while
     True: d=int(input("--->")) if d==-1:
           break
        a.append(d)
     print("ENTER THE ELEMENTS TO ADD SECOND
     LIST") print("PRESS -2 TO EXIT THIS LIST") while True:
     e=int(input("--->")) if e==-2:
           break
        b.append(e)
  if c==2:
    break
```

```
print(a) print(b)
print("list_length",proxy.list_length(a))
print("list_maximum",proxy.list_maximum(a)
)
print("list_minimum",proxy.list_minimum(a))
print("list_to_set",proxy.list_to_set(a))
print("list_concate",proxy.list_concate(a,b))
```

Output:

Server output:

Listening on port 8000...

Client output:

PRESS 1-->START || 2--> STOP
ENTER THE ELEMENTS TO ADD FIRST LIST
PRESS -1 TO EXIT THIS LIST
5
3
8
5
-1
ENTER THE ELEMENTS TO ADD SECOND LIST
PRESS -2 TO EXIT THIS LIST
7
2
3
-2
First list: [5, 3, 8, 5] Second list:
[7, 2, 3] list_length: 4

list_maximum: 8 list_minimum:
3 list_to_set: [3, 5, 8]
list_concate: [5, 3, 8, 5, 7, 2, 3]
PRESS 1--> START || 2-->
STOP ENTER YOUR CHOICE:
2

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RESULT:

Procedure call for list operations - XMLRPC is remoted.