Function Definition

- `def` keyword: Indicates beginning of a function definition

- **function name**: Unique name within module for calling by other portions of code

- **function parameters**: Parameters passed to the function to be used in the function's code

- **function return values**: returned items for use by calling code

```
def function_name(parameter-list):
    # code of function
    return return-value
```

Function Definition: Example

```
def connect(dev_IP, username, password):
    cmd = 'ssh '+ username  + '@' + dev_IP
    session = pexpect.spawn (cmd, timeout=20)
    ...
    return session


...

session = connect('10.0.0.1','cisco','cisco')
```

Calling a Function

```
session = connect('10.0.0.1','cisco','cisco')
```
- **Function name**: specify the name of the function you are calling

```
session = connect ('10.0.0.1','cisco','cisco')
```
- **Parameters**: specify parentheses (..), with parameters inside

```
session = connect ('10.0.0.1','cisco','cisco')
```
- **Return value**: specify where the return value is to be placed.

This example defines a function that is called 'connect', which connects to the given device using Pexpect and returns the resulting 'session' object to the caller.

```python
#------------------------------------------------------------
# The following code connects to a device

def connect(dev_ip,username,password):

    print '--- attempting to: ssh '+username+'@'+dev_ip

    session = pexpect.spawn('ssh '+username+'@'+dev_ip, timeout=20)
    result = session.expect(['password:', pexpect.TIMEOUT])

    # Check for failure
    if result != 0:
        print '--- Timout or unexpected reply from device'
        return 0

    print '--- attempting to: password: '+password

    # Successfully got password prompt, logging in with password
    session.sendline(password)
    session.expect('#')

    return session  # return pexpect session object to caller


#------------------------------------------------------------
```

Notice the following:

- **Function name:** connect, the name that will be used by the calling code.

- **Function parameters:** the device IP address, username, password, that will be used by the function when attempting to connect to the device.

- **Function body:** all the code to use Pexpect to execute an ssh command using the IP address and username, and to enter in the password when prompted.

- **Function return value:** session, the object returned to the calling code.

Calling a Function

To complete the picture, here is a sample of the code that is used to call the function:

```
session = connect('10.0.0.1','cisco','cisco')
```

The calling code shows the following:

- **Function name:** connect (same as the name in the function definition).

- **Function parameters:** the actual values that are passed are the IP address ('10.0.0.1'), the username ('cisco'), and the password ('cisco').

- **Function return value:** 'session', which is the value returned as an object representing the SSH Pexpect session.

There are a couple of things to note:

- The function name must match exactly the value specified in the function definition.

- The values that are passed to the function as parameters – which are called the 'arguments' – are the actual values that will be used by the function. You can pass specific constant variables, as is done here, or you can pass a variable name which points to the actual values.

- The returned value goes on the left-hand side of an assignment statement – which is how the value is returned to your calling code. The actual name of the variable you use to hold the returned value can be anything; in the example, it just happens to be the same as the returned value specified in the function definition.

Documenting a Function

Functions are for use by other parts of your code, and perhaps even for use by other people's code. Therefore it is important to make sure that they are documented.

The standard manner for documenting functions in Python is by using a `docstring`, which is a long string literal spanning multiple lines. This `docstring` will document the purpose of your function, the parameters of your function, and the return values of your function.

The following is an example of a `docstring` for the 'connect' function:

```
dev connect(dev_ip, username, password)
    """

    Connects to device using pexpect
    :dev_ip: The IP address of the device
    :username: The username for logging in
    :password: The password for logging in
    =return value: successful: pexpect session object
                   not successful: 0
    """
```

There are different recommendations for how exactly to format your `docstring`, depending on your organization and its preferences. Whatever format you choose, a `docstring` should specify the following items:

- The purpose of the function
- The parameters passed to the function
- The values returned by the function