

## Python – Experiment 4

**AIM :** Python applications using modules, packages, multithreading and exception handling

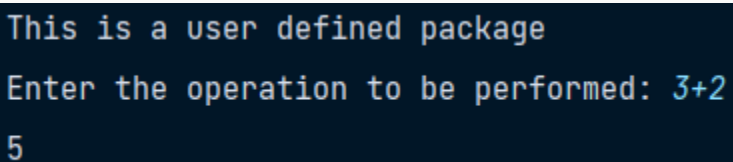
**LO - 4 :** Create Python applications using modules, packages, multithreading and exception handling.

a) Creating User-defined modules/packages and import them in a program

**Code:**

```
def display():  
    print("This is a user defined package")  
  
def calc():  
    c = eval(input("Enter the operation to be performed: "))  
    print(c)  
  
import exp  
exp.display()  
exp.calc()
```

**Output:**

A screenshot of a terminal window with a dark blue background. It shows the output of the Python program: "This is a user defined package", followed by a prompt "Enter the operation to be performed: 3+2", and the result "5".

```
This is a user defined package  
Enter the operation to be performed: 3+2  
5
```

b) Creating user defined multithreaded application with thread synchronization and deadlocks

**Code:**

```
import threading  
x = 0  
def increment():  
    global x  
    x += 1
```

```
def thread_task():  
    for _ in range(1000):  
        increment()  
def main_task():  
    global x  
    x = 0  
    t1 = threading.Thread(target=thread_task)  
    t2 = threading.Thread(target=thread_task)  
    t1.start()  
    t2.start()  
    t1.join()  
    t2.join()  
if __name__ == "__main__":  
    for i in range(10):  
        main_task()  
        print("Iteration {0}: x = {1}".format(i, x))
```

**Output:**

```
Iteration 0: x = 2000  
Iteration 1: x = 2000  
Iteration 2: x = 2000  
Iteration 3: x = 2000  
Iteration 4: x = 2000  
Iteration 5: x = 2000  
Iteration 6: x = 2000  
Iteration 7: x = 2000  
Iteration 8: x = 2000  
Iteration 9: x = 2000
```

c) Creating a menu driven application which should cover all the exceptions in python.

**Code:****while True:**

```
    print("1.ZeroDivisionError\n 2.NameError\n 3.SyntaxError\n 4.IndexError\n5.KeyError\n 6.TypeError\n 7.ImportError\n 0.Exit")
    a = int(input("Enter your choice: "))
    if a == 1:
        try:
            print(1/0)
        except ZeroDivisionError as e:
            print("ZeroDivisionError:", e)
    elif a == 2:
        try:
            print(b.name)
        except NameError as e:
            print("NameError")
    elif a == 3:
        try:
            print(1+"1")
        except SyntaxError as e:
            print("SyntaxError :",e)
    elif a == 4:
        try:
            print(a[10])
        except IndexError as e:
            print("IndexError :",e)
    elif a == 5:
        try:
            print(a["name"])
        except KeyError as e:
            print("KeyError :",e)
    elif a == 6:
        try:
            print(int("a"))
        except TypeError as e:
            print("TypeError :",e)
```

```

elif a == 7:
    try:
        import soham
    except ImportError as e:
        print("ImportError :",e)
elif a == 0:
    break
else:
    print("Invalid choice")

```

### Output:

```

Enter your choice: 1
1.ZeroDivisionError
2.NameError
3.SyntaxError
4.IndexError
5.KeyError
6.TypeError
7.ImportError
0.Exit
ZeroDivisionError: division by zero
Enter your choice: 2
1.ZeroDivisionError
2.NameError
3.SyntaxError
4.IndexError
5.KeyError
6.TypeError
7.ImportError
0.Exit
Enter your choice: 3
1.ZeroDivisionError
2.NameError
3.SyntaxError
4.IndexError
5.KeyError
6.TypeError
7.ImportError
0.Exit
Traceback (most recent call last):
  File "d:\Coding\Python\Experiments\error.py", line 17, in <module>
    print(1+"1")
TypeError: unsupported operand type(s) for +: 'int' and 'str'
Enter your choice: 4
1.ZeroDivisionError
2.NameError
3.SyntaxError
4.IndexError
5.KeyError
6.TypeError
7.ImportError
0.Exit
Traceback (most recent call last):
  File "d:\Coding\Python\Experiments\error.py", line 23, in <module>
    print(a[10])
TypeError: 'int' object is not subscriptable
Enter your choice: 5
1.ZeroDivisionError
2.NameError
3.SyntaxError
4.IndexError
5.KeyError
6.TypeError
7.ImportError
0.Exit
Traceback (most recent call last):
  File "d:\Coding\Python\Experiments\error.py", line 28, in <module>
    print(a["name"])
TypeError: 'int' object is not subscriptable
Enter your choice: 6
1.ZeroDivisionError
2.NameError
3.SyntaxError
4.IndexError
5.KeyError
6.TypeError
7.ImportError
0.Exit
Traceback (most recent call last):
  File "d:\Coding\Python\Experiments\error.py", line 33, in <module>
    print(int("a"))
ValueError: invalid literal for int() with base 10: 'a'
Enter your choice: 7
1.ZeroDivisionError
2.NameError
3.SyntaxError
4.IndexError
5.KeyError
6.TypeError
7.ImportError
0.Exit
Traceback (most recent call last):
  File "d:\Coding\Python\Experiments\error.py", line 38, in <module>
    import soham
ImportError: cannot import name 'soham' from 'error' (current directory)
Enter your choice: 0
0.Exit

```

### Conclusion:

From this experiment we have learnt the multithreading and also how to import user defined packages.