EX.NO: 04	MODULES AND PACKAGES
DATE:	

PROGRAM 1:

Modules1.py

Product.py:

```
products = {}
def add_product(product_id, name, price, quantity):
     products[product_id] = {
        'name': name,
        'price': price,
        'quantity': quantity
    }
def update_stock(product_id, quantity):
    if product_id in products:
        products[product_id]['quantity'] += quantity
    else:
        print("Product ID not found")
def get_product_info(product_id):
    if product_id in products:
       return products[product_id]
    else:
       return "Product not found"
```

Sales.py:

```
import product
sales_log = []
def sell_product(product_id, quantity):
    if product_id in product.products:
       prod = product.products[product_id]
       if prod['quantity'] >= quantity:
          prod['quantity'] -= quantity
          total_price = prod['price'] * quantity
```

```
        sales_log.append({
         'product_id': product_id,
         'quantity': quantity,
         'total_price': total_price
        })
        return "Sold {} units. Total: {}".format(quantity, total_price)
    else:
        return "Insufficient stock"
else:
    return "Product not found"
def show_sales():
    return sales_log
```

Calci.py:

```
import product
import sales
product.add_product(101, "Notebook", 50.0, 100)
product.add_product(102, "Pen", 10.0, 200)
print(product.get_product_info(101))
print(sales.sell_product(101, 2))
print(sales.sell_product(102, 5))
print(product.get_product_info(101))
print(sales.show_sales())
```

OUTPUT:

```
{'name': 'Notebook', 'price': 50.0, 'quantity': 100}
Sold 2 units. Total: 100.0
Sold 5 units. Total: 50.0
{'name': 'Notebook', 'price': 50.0, 'quantity': 98}
[{'product_id': 101, 'quantity': 2, 'total_price': 100.0}, {'product_id': 102, 'quantity': 5, 'total_price': 50.0}]
```

PROGRAM 2:

Modules1.py

Scientific Calculator You're building a scientific calculator app. To keep the code clean, math operations are split into separate modules within a calculator package.

scical.py:

```
import math

def sqrt(a):
    if a < 0:
        raise ValueError("Square root of negative number is imaginary.")
    return math.sqrt(a)

def power(a, b):
    return math.pow(a, b)

def log(a, base=10):
    if a <= 0:
        raise ValueError("Logarithm of non-positive number is undefined.")
    return math.log(a, base)

def sine(degrees):
    return math.sin(math.radians(degrees))

def cosine(degrees):
    return math.cos(math.radians(degrees))

def tangent(degrees):
    return math.tan(math.radians(degrees))
```

basic.py:

```
import math

def add(a, b):
    return a + b

def sub(a, b):
    return a - b

def multiply(a, b):
```

```
    return a * b

def division(a, b):
    if b == 0:
        raise ValueError("Cannot divide by zero.")
    return a / b

def floor_division(a, b):
    if b == 0:
        raise ValueError("Cannot divide by zero.")
    return a // b

def mod(a, b):
    if b == 0:
        raise ValueError("Cannot modulo by zero.")
    return a % b

def power(a, b):
    return math.pow(a, b)
```

main.py:

```
from standard_calculator.stdcal import (
    add, sub, multiply, division,
    floor_division, mod, power as std_power
)
from scientific_calculator.scical import (
    sqrt, power as sci_power,
    log, sine, cosine, tangent
)

if __name__ == "__main__":
    a = int(input("Enter value for a: "))
    b = int(input("Enter value for b: "))

    print("\nStandard Operations:")
    print("Add:", add(a, b))
    print("Sub:", sub(a, b))
    print("Multiply:", multiply(a, b))


    if b != 0:
        print("Division:", division(a, b))
        print("Floor Division:", floor_division(a, b))
        print("Mod:", mod(a, b))
    else:
        print("Cannot perform division, floor division, or modulo by zero.")

    print("Power (std):", std_power(a, b))
```

```
print("\nScientific Operations (using 'a'):")

if a >= 0:
    print("Sqrt(a):", sqrt(a))
else:
    print("Cannot compute square root of negative number.")

print("Power(a^b):", sci_power(a, b))


if a > 0:
    print("Log(a):", log(a))
else:
    print("Cannot compute logarithm of non-positive number.")

print("Sine(a°):", sine(a))
print("Cosine(a°):", cosine(a))
print("Tangent(a°):", tangent(a))
```

OUTPUT:

```
Enter value for a: 10
Enter value for b: 20

Standard Operations:
Add: 30
Sub: -10
Multiply: 200
Division: 0.5
Floor Division: 0
Mod: 10
Power (std): 1e+20

Scientific Operations (using 'a'):
Sqrt(a): 3.1622776601683795
Power(a^b): 1e+20
Log(a): 1.0
Sine(a°): 0.17364817766693033
Cosine(a°): 0.984807753012208
Tangent(a°): 0.17632698070846498
```

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Program	10	
Output	5	
Viva-Voce	5	
Total	20	