ASSIGNMENT – 1

ROLL NO : 27

NAME : SHINGALA NISHIT

CLASS : MCA 1

SUBJECT : PYTHON PROGRAMMING

1. Display the difference in dates

```
from datetime import date

# Input two dates in YYYY-MM-DD format

d1 = date(2025, 9, 20)
d2 = date(2026, 9, 20)

# Difference
diff = d2 - d1
print("Difference in Days: ",diff.days)
```

OUTPUT:

Difference in Days: 365

2. Display time since epoch in hours and minutes

```
import time

# seconds since epoch
seconds = time.time()

hours = seconds // 3600
minutes = seconds // 60

print("Since epoch:")
print("Hours:", hours)
print("Minutes:", minutes)
```

OUTPUT:

Since epoch:
Hours: 488296.0
Minutes: 29297798.0

3. Display your age in years, months, days

```
from datetime import date

birth = date(2004, 9, 20)
today = date.today()

years = today.year - birth.year
month = today.month - birth.month
day = today.day - birth.day

# Adjust for negatives
if day < 0:
    month -= 1
    day += 30
if month < 0:
    years -= 1
    month += 12

print(f"I am {years} Years, {month} Months & {day} Days old.")
```

OUTPUT:

I am 20 Years, 11 Months & 24 Days old.

4. Display trigonometric table of sin, cos, tan

```
import math

print("Angle\tsin\tcos\ttan")

for angle in range(0,91,15):
    rad = math.radians(angle)
    print(f"{angle}\t{math.sin(rad):.2f}\t{math.cos(rad):.2f}\t{math.tan(rad):.2f}")

#Trigonometric functions use radians, so we convert degrees using math.radians()
```

OUTPUT:

Angle	sin	cos	tan
0	0.00	1.00	0.00
15	0.26	0.97	0.27
30	0.50	0.87	0.58
45	0.71	0.71	1.00
60	0.87	0.50	1.73
75	0.97	0.26	3.73
90	1.00	0.00	16331239353195370.00

5. Generate 10 Random Numbers

```
import random

for i in range(1,11):
    i = random.randint(1,100)
    print(i)

# randint(a, b) generates random integer between a and b
```

OUTPUT:

62 20 91 55 53 15 15 39 24 38

6. Authentication (Simple Compare)

```
# Store crediantials

username = "@NDS"
password = "MCA#127"

print("-----Sign In-----\n")
u = input("Enter Username: ")
p = input("Enter Password: ")

if(u == username and p == password):
    print("Welcome to MCA-1")
else:
    print("Invalid Crediantials!")
```

OUTPUT:

Enter Username: @NDS
Enter Password: 123
Invalid Crediantials!

7. Authentication (with Encryption)

```
from cryptography.fernet import Fernet

# generate key

key = Fernet.generate_key()
cipher = Fernet(key)

# original password
passwrd = "MCA#127"
encrypted = cipher.encrypt(passwrd.encode())

# Input password
u = input("Enter username: ")
p = input("Enter password: ")

if cipher.decrypt(encrypted).decode() == p:
    print("Login Successful")
else:
    print("Invalid credentials")

# We encrypt the stored password and decrypt for comparison.
```

OUTPUT:

Enter username: @NISHIT
Enter password: NDS9071
Invalid credentials

8. Authentication (with Hashing)

```
import hashlib

stored = hashlib.sha256("12345".encode()).hexdigest()

u = input("Enter username: ")
p = input("Enter password: ")

hashed = hashlib.sha256(p.encode()).hexdigest()

if hashed == stored:
    print("Login Successful")
else:
    print("Invalid credentials")

# Hashing is one-way (cannot be reversed). We hash both stored and input, then compare.
```

OUTPUT:

Enter username: NISHIT
Enter password: 12345
Login Successful

9. Convert string "Hello$World" into Base64

```
import base64
text = "Hello$World"
encoded = base64.b64encode(text.encode())
print("Base64: ",encoded.decode())
```

OUTPUT:

Base64: SGVsbG8kV29ybGQ=

10. String Manipulation Exercises

EX – 1

```
str = "Python123"
print("Reversed: ",str[::-1])
str1 = "Emma is a data scientist who knows Python."
bit = str1.split(" ")
for i in bit:
    print(i)
```

OUTPUT:

Reversed: 321nohtyP
Emma
is
a
data
scientist
who
knows
Python.

EX – 2

```
# Create a string made of the first, middle and last character - slicing

str1 = "James"
print(str1[::2])

# Create a string made of the middle three characters
str2 = "JhonDipPeta"
print(str2[4:7])

str3 = "JaSonAy"
print(str3[2:5])
```

OUTPUT:

Jms
Dip
Son

EX – 3

```
# Append new string in the middle of a given string
s1 = "Ault"
s2 = "Kelly"
s3 = s1+s2
print(s3)
```

OUTPUT:

AultKelly

EX – 4

```
str4 = "PYnAtivE"

lower = []
upper = []

for i in str4:
    if(i.islower()):
        lower.append(i)
    else:
        upper.append(i)

joined = ''.join(lower + upper)
print(joined)
```

OUTPUT:

ntivPYAE

EX – 5

```
input_str = "PYnative29@#8496"

total = 0
flag = 0

for i in input_str:
    if(i.isdigit()):
        flag = flag + 1
        total = total + int(i)

avg = total / flag
print(avg)
```

OUTPUT: **6.333333333333333**