

Assignment-2:

1. Display the difference in dates

```
2. from datetime import date
3.
4. d1 = date(2025, 9, 13)
5. d2 = date(2025, 9, 10)
6.
7. diff = d1 - d2
8. print("Difference ", diff.days, " days")
```

Output:

Difference 3 days

2. Display time since epoch in hours and minutes

```
import time
seconds = time.time()
hours = seconds // 3600
minutes = seconds // 60
print("Hours passed since epoch: ", hours)
print("Minutes passed since epoch: ", minutes)
```

Output:

Hours passed since epoch: 488340.0

Minutes passed since epoch: 29300455.0

3. Display your age in years, months and days

```
from datetime import date
from dateutil.relativedelta import relativedelta

dob = date(2004, 10, 31)
today = date.today()

age = relativedelta(today, dob)
print(f"Your age: {age.years} years, {age.months} months, {age.days} days")
```

Output:

Your age: 20 years, 10 months, 16 days

4. Display trigonometric table of sin, cos and tan

```
import math

angles = [0, 30, 45, 60, 90]
print(f"Angle\tsin\tcos\ttan")

for angle in angles:
    rad = math.radians(angle)
    sin_val = round(math.sin(rad), 3)
    cos_val = round(math.cos(rad), 3)

    if(cos_val == 0):
        tan_val = "Undefined"
    else:
        tan_val = round(math.tan(rad), 3)

    print(f"{angle}\t{sin_val}\t{cos_val}\t{tan_val}")
```

Output:

Angle	sin	cos	tan
0	0.0	1.0	0.0
30	0.5	0.866	0.577
45	0.707	0.707	1.0
60	0.866	0.5	1.732
90	1.0	0.0	Undefined

5. Generate 10 random numbers

```
import random
def random_num(count, low=0, high=100):
    return [random.randint(low, high) for _ in range(count)]

print(random_num(10))
```

Output:

[69, 58, 33, 42, 61, 47, 31, 25, 68, 79]

6. Authentication: Ask username, password and compare

```
correct_username = "admin"
correct_password = "12345"

username = input("Enter username: ")
password = input("Enter password: ")
```

```
if(username == correct_username and password == correct_password):  
    print("Login successful!")  
else:  
    print("Invalid username or password")
```

Output:

Enter username: admin

Enter password: 12345

Login successful!

7. Authentication: Ask username, password and compare with encryption

```
from cryptography.fernet import Fernet  
  
key = Fernet.generate_key()  
cipher = Fernet(key)  
users = {  
    "admin" : cipher.encrypt(b"12345"),  
    "varun" : cipher.encrypt(b"67890")  
}  
  
username = input("Enter username: ")  
if username not in users:  
    print("Invalid Username")  
else:  
    password = input("Enter password: ")  
    stored_password = cipher.decrypt(users[username]).decode()  
    if(password == stored_password):  
        print("Login Successful!")  
    else:  
        print("Invalid Password")
```

Output:

Enter username: admin

Enter password: 12345

Login Successful!

8. Authentication: Ask username, password and compare with hashing

```
import hashlib  
  
def hash_password(password):  
    return hashlib.sha256(password.encode()).hexdigest()  
  
users = {  
    "admin" : hash_password("12345"),
```

```

    "varun" : hash_password("67890")
}

username = input("Enter username: ")
if username not in users:
    print("Invalid Username")
else:
    password = input("Enter password: ")
    entered_hashed = hash_password(password)
    if(entered_hashed == users[username]):
        print("Login Successful!")
    else:
        print("Invalid Password")

```

Output:

Enter username: admin

Enter password: 12345

Login Successful!

9.Convert string "Hello\$World" into Base64

```

import base64

msg = "Hello$World"
msg_bytes = msg.encode("utf-8")
base64_bytes = base64.b64encode(msg_bytes)
base64_string = base64_bytes.decode("utf-8")

print("Original:", msg)
print("Base64: ", base64_string)

```

Output:

Original: Hello\$World

Base64: SGVsbG8kV29ybGQ=

10.Code for String Manipulation

```

# Reverse a given string
str1 = "PYnative"
print("Original: ", str1)
str1 = ''.join(reversed(str1))
print("Reversed: ", str1)

```

Output:

Original: PYnative

Reversed: evitanYP

```
# Find the last position of a given substring
str1 = "Emma is a data scientist who knows Python. Emma works at google."
print("Last occurrence of Emma starts at index: ", str1.rfind("Emma"))
```

Output:

Last occurrence of Emma starts at index: 43

```
# Split a string on hyphens
str1 = "Emma-is-a-data-scientist"
splitted_strings = str1.split("-")
for string in splitted_strings:
    print(string)
```

Output:

Emma

is

a

data

scientist

```
# Remove empty strings from a list of strings
str_list = ["Emma", "Jon", "", "Kelly", None, "Eric", ""]
print("Original list of sting")
print(str_list)
new_list = list(filter(None, str_list))
print("After removing empty strings")
print(new_list)
```

Output:

Original list of sting

['Emma', 'Jon', '', 'Kelly', None, 'Eric', '']

After removing empty strings

['Emma', 'Jon', 'Kelly', 'Eric']

```
# Remove special symbols / punctuation from a string
import string
str1 = "/*Jon is @developer & musician"

new_str1 = str1.translate(str.maketrans('', '', string.punctuation))
print(new_str1)
```

Output:

Jon is developer musician

```
# Removal all characters from a string except integers
str1 = 'I am 25 years and 10 months old'
only_int = "".join(item for item in str1 if item.isdigit())
print(only_int)
```

Output:

2510

```
# Find words with both alphabets and numbers
str1 = "Emma25 is Data scientist50 and AI Expert"
words = str1.split()
result = []
for word in words:
    has_alpha = any(c.isalpha() for c in word)
    has_digit = any(c.isdigit() for c in word)
    if has_alpha and has_digit:
        result.append(word)
for word in result:
    print(word)
```

Output:

Emma25

scientist50

```
# Replace each special symbol with # in the following string
import string
str1 = '/*Jon is @developer & musician!!'
replace_char = "#"
for char in string.punctuation:
    str1 = str1.replace(char, replace_char)
print(str1)
```

Output:

##Jon is #developer # musician##