# Digital Image Processing
# ASSIGNMENT -1

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**AP21110010201**

1. Write a Python program to print the following string in a specific format (see the output).

   Sample String : "Twinkle, twinkle, little star, How I wonder what you are! Up above the world so high, Like a diamond in the sky. Twinkle, twinkle, little star, How I wonder what you are"

   Output :

   Twinkle, twinkle, little star,
   How I wonder what you are!
   Up above the world so high,
   Like a diamond in the sky.
   Twinkle, twinkle, little star,
   How I wonder what you are

```python
# Q1)Write a Python program to print the following string in a
# specific format (see the output).
# Sample String : "Twinkle, twinkle, little star,
# How I wonder what you are!
# Up above the world so high,
# Like a diamond in the sky.
# Twinkle, twinkle, little star,
# How I wonder what you are"

poem = """Twinkle, twinkle, little star,
How I wonder what you are!
Up above the world so high,
Like a diamond in the sky.
Twinkle, twinkle, little star,
How I wonder what you are"""
print(poem)
```

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2. Write a Python program to find out what version of Python you are using.

```python
# Q2) Write a Python program to find out what version of
# Python you are  using.

import sys
print(sys.version)
```

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3. Write a Python program to display the current date and time.

```python
# Q3) Write a Python program to display the current date and time.

import sys
print(sys.version)
```

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4. Write a Python program that calculates the area of a circle based on the radius entered by the user.

```python
# Q4) Write a Python program that calculates the area
# of a circle based on the radius entered by the user.

a=int(input())
print("Area = ",3.14*(a*a))
```

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5. Write a Python program that accepts the user's first and last name and prints them in reverse order with a space between them.

```python
# Q5) Write a Python program that accepts the user's
# first and last name and prints them in reverse order with a space between them.

fn=input("Enter your first name: ")
ln=input("Enter your last name: ")
print(ln,fn)
```

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6. Write a Python program that accepts a sequence of comma-separated numbers from the user and generates a list and a tuple of those numbers
Sample data : 3, 5, 7, 23
Output :

List : ['3', ' 5', ' 7', ' 23']
Tuple : ('3', ' 5', ' 7', ' 23')

```python
# Q6) Write a Python program that accepts a sequence of comma-separated
# numbers from the user and generates a list and a tuple of those numbers
# Sample data : 3, 5, 7, 23
# Output :
# List : ['3', ' 5', ' 7', ' 23']
# Tuple : ('3', ' 5', ' 7', ' 23')


input_data = input()
number_list = input_data.split(',')
number_tuple = tuple(number_list)
print("List:", number_list)
print("Tuple:", number_tuple)
```

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7. Write a Python program that accepts a filename from the user and prints the
extension of the file.
Sample filename : abc.java
Output : java

```python
# Q7) Write a Python program that accepts a filename from the user and prints the
# extension of the file.
# Sample filename : abc.java
# Output : java

filename = input("Enter a filename: ")
extension = filename.split(".")
print("Extension:", extension[-1])
```

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8. Write a Python program to display the first and last colors from the following
list.
color_list = [″Red″,″Green″,″White″ ,″Black″]

```
# Q8) Write a Python program to display the first and last colors from the following
# list.
# color_list = ["Red","Green","White" ,"Black"]


color_list=["Red","Green","White" ,"Black"]
print(color_list[0],color_list[-1])
```

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9. Write a Python program to display the examination schedule. (extract the date
from exam_st_date).
exam_st_date = (11, 12, 2014)
Sample Output : The examination will start from : 11 / 12 / 2014

```
# Q9) Write a Python program to display the examination schedule. (extract the date
# from exam_st_date).
# exam_st_date = (11, 12, 2014)
# Sample Output : The examination will start from : 11 / 12 / 2014

exam_st_date = (11, 12, 2014)
print("The Examination will start from:")
for i in range(len(exam_st_date)):
    print(exam_st_date[i],end="")
    if i+1 is not len(exam_st_date):
        print(" / ",end="")
```

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10. Write a Python program that accepts an integer (n) and computes the value
of n+nn+nnn.

Sample value of n is 5
Expected Result : 615

```python
# Q10) Write a Python program that accepts an integer (n) and computes the value
# of n+nn+nnn.
# Sample value of n is 5
# Expected Result : 615

n=int(input()
print(n+(n*10+n)+(n*100+n*10+n))
```

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11. Write a Python function that takes a sequence of numbers and determines
whether all the numbers are different from each other.

```python
# Q11) Write a Python function that takes a sequence of numbers and determines
# whether all the numbers are different from each other.

def fun(data):
    if len(data) == len(set(data)):
        print("All numbers are distinct")
    else:
        print("All numbers are not distinct")

ls=list(map(int,input("Enter the numbers: ").split()))
fun(ls)
```

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12. Write a Python program that creates all possible strings using the letters 'a',
'e', 'i', 'o', and 'I'. Ensure that each character is used only once.

```python
# Q12) Write a Python program that creates all possible strings using the letters 'a',
# 'e', 'i', 'o', and 'I'. Ensure that each character is used only once.

import itertools

def generate_strings():
    letters = ['a', 'e', 'i', 'o', 'I']
    permutations = itertools.permutations(letters)
    for p in permutations:
        print(''.join(p))

generate_strings()
```

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13. Write a Python program that removes and prints every third number from a
list of numbers until the list is empty.

```python
# Q13) Write a Python program that removes and prints every third number from a
# list of numbers until the list is empty.

def remove_every_third(numbers):
    index = 2
    while numbers:
        if index >= len(numbers):
            index = index % len(numbers)
        print(numbers.pop(index))
        index += 2

numbers = [1, 2, 3, 4, 5, 6, 7, 8, 9]
remove_every_third(numbers)
```

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14. Write a Python program to identify unique triplets whose three elements sum
to zero from an array of n integers.

```python
# Q14) Write a Python program to identify unique triplets whose three elements sum
# to zero from an array of n integers.

def find_zero_sum_triplets(arr):
    arr.sort()
    n = len(arr)
    triplets = set()

    for i in range(n - 2):
        if i > 0 and arr[i] == arr[i - 1]:
            continue
        left, right = i + 1, n - 1
        while left < right:
            total = arr[i] + arr[left] + arr[right]
            if total == 0:
                triplets.add((arr[i], arr[left], arr[right]))
                while left < right and arr[left] == arr[left + 1]:
                    left += 1
                while left < right and arr[right] == arr[right - 1]:
                    right -= 1
                left += 1
                right -= 1
            elif total < 0:
                left += 1
            else:
                right -= 1

    return list(triplets)

# Example usage
array = [-1, 0, 1, 2, -1, -4]
unique_triplets = find_zero_sum_triplets(array)
print("Unique triplets that sum to zero:")
for triplet in unique_triplets:
    print(triplet)
```

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15. Write a Python program to make combinations of 3 digits.

```python
# Q15) Write a Python program to make combinations of 3 digits.

import itertools

def generate_combinations():
    digits = '0123456789'
    combinations = itertools.combinations(digits, 3)
    for combo in combinations:
        print(''.join(combo))

generate_combinations()
```

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16. Write a Python program that prints long text, converts it to a list, and prints all
the words and the frequency of each word.

```python
# Q16) Write a Python program that prints long text, converts it to a list, and prints all
# the words and the frequency of each word.

from typing import Counter

def process_text(text):
    words = text.split()

    word_count = Counter(words)

    for word, frequency in word_count.items():
        print(f"{word}: {frequency}")

long_text = """
This is a sample text. This text is provided as a sample to test the word frequency counter.
Feel free to modify the text and test the program with different inputs.
"""
print("\nWord Frequencies:")
process_text(long_text)
```

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17. Write a Python program to count the number of each character in a text file.

```python
# Q17) Write a Python program to count the number of each character in a text file.

from collections import Counter

def count_characters_in_file(file_path):
    with open(file_path, 'r') as file:
        text = file.read()
    char_count = Counter(text)
    for char, count in char_count.items():
        print(f"{char}: {count}")

file_path = 'example.txt'
count_characters_in_file(file_path)
```

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18. Write a Python program that retrieves the top stories from Google News.

```python
# Q18) Write a Python program that retrieves the top stories from Google News

from GoogleNews import GoogleNews
googlenews = GoogleNews()
googlenews.search('India')
googlenews.get_page(1)
result = googlenews.result()
for x in result:
    print("-"*50)
    print("Title--",x['title'])
    print("Date/Time--",x['date'])
    print("Description--",x['desc'])
    print("Link--",x['link'])
```

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19. Write a Python program to get a list of locally installed Python modules.

```python
# Q19) Write a Python program to get a list of locally installed Python modules.

import pkg_resources
installed_packages = pkg_resources.working_set
installed_packages_list = sorted(["%s==%s" % (i.key, i.version)
    for i in installed_packages])
print(installed_packages_list)
```

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20. Write a Python program to display some information about the OS where the script is running.

```python
# Q20) Write a Python program to display some information about the
# OS where the script is running.

import platform as pl
os_profile = [
    'platform',
    'processor',
    'python_build',
    'python_compiler',
    'python_version',
    'release',
    'system',
    'uname',
    'version',
]
for key in os_profile:
    if hasattr(pl, key):
        print(key + ": " + str(getattr(pl, key)()))
```

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