Interview Questions  
python

16. Write a program to generate all possible permutations of a given list.

Solution- def permute(lst):

# Base case: if the list is empty, return an empty list

if len(lst) == 0:

return []

# Base case: if the list has one element, return a list containing that element

if len(lst) == 1:

return [lst]

# Recursive case: generate permutations

result = [] # This will store all permutations

for i in range(len(lst)):

# Take the current element

current = lst[i]

# Generate permutations of the remaining elements

remaining\_elements = lst[:i] + lst[i+1:]

# Recursively generate all permutations of the remaining elements

for p in permute(remaining\_elements):

# Append the current element to each permutation of the remaining elements

result.append([current] + p)

return result

# Example usage:

input\_list = [1, 2, 3]

permutations = permute(input\_list)

for p in permutations:

print(p)

17. Implement a function to check if a given year is a leap year or not.

Solution- def is\_leap\_year(year):

if year % 4 == 0:

if year % 100 == 0:

if year % 400 == 0:

return True

else:

return False

else:

return True

else:

return False

# Example usage:

year = 2024

if is\_leap\_year(year):

print(f"{year} is a leap year.")

else:

print(f"{year}

18. Create a program to convert Celsius to Fahrenheit and vice versa.

Solution- def celsius\_to\_fahrenheit(celsius):

"""Convert Celsius to Fahrenheit."""

return (celsius \* 9/5) + 32

def fahrenheit\_to\_celsius(fahrenheit):

"""Convert Fahrenheit to Celsius."""

return (fahrenheit - 32) \* 5/9

def main():

while True:

print("Temperature Conversion")

print("1. Celsius to Fahrenheit")

print("2. Fahrenheit to Celsius")

print("3. Exit")

choice = input("Choose an option (1/2/3): ")

if choice == '1':

celsius = float(input("Enter temperature in Celsius: "))

fahrenheit = celsius\_to\_fahrenheit(celsius)

print(f"{celsius}°C is equal to {fahrenheit}°F\n")

elif choice == '2':

fahrenheit = float(input("Enter temperature in Fahrenheit: "))

celsius = fahrenheit\_to\_celsius(fahrenheit)

print(f"{fahrenheit}°F is equal to {celsius}°C\n")

elif choice == '3':

print("Exiting the program.")

break

else:

print("Invalid choice, please select 1, 2, or 3.\n")

if \_\_name\_\_ == "\_\_main\_\_":

main()

19. Write a Python function to calculate the area of a circle given its radius.

Solution- import math

def calculate\_circle\_area(radius):

"""Calculate the area of a circle given its radius."""

if radius < 0:

return None # Return None for negative radius (invalid input)

return math.pi \* radius \*\* 2

# Example usage

radius = 5

area = calculate\_circle\_area(radius)

if area is not None:

print(f"The area of the circle with radius {radius} is {area:.2f} square units.")

else:

print("Invalid radius. Radius must be a non-negative number.")

20. Implement a program to find the LCM (Least Common Multiple) of two numbers.

Solution- import math

def lcm(a, b):

"""Calculate the Least Common Multiple (LCM) of two numbers."""

# Return 0 if any of the numbers is zero

if a == 0 or b == 0:

return 0

# Calculate the absolute value of the product of the two numbers

product = abs(a \* b)

# Calculate the LCM using the formula LCM(a, b) = |a \* b| / GCD(a, b)

return product // math.gcd(a, b)

# Example usage

num1 = 12

num2 = 15

lcm\_result = lcm(num1, num2)

print(f"The LCM of {num1} and {num2} is {lcm\_result}.")