PYTHON – WORKSHEET 1

Q1 to Q8 have only one correct answer. Choose the correct option to answer your question.

1. Which of the following operators is used to calculate remainder in a division?
   A) # B) &
   C) % D) $
2. In python 2//3 is equal to?
   A) 0.666 B) 0
   C) 1 D) 0.67
3. In python, 6<<2 is equal to?
   A) 36 B) 10
   C) 24 D) 45
4. In python, 6&2 will give which of the following as output?
   A) 2 B) True
   C) False D) 0
5. In python, 6|2 will give which of the following as output?
   A) 2 B) 4
   C) 0 D) 6
6. What does the finally keyword denotes in python?
   A) It is used to mark the end of the code
   B) It encloses the lines of code which will be executed if any error occurs while executing the lines of code in the try block.
   C) the finally block will be executed no matter if the try block raises an error or not.
   D) None of the above
7. What does raise keyword is used for in python?
   A) It is used to raise an exception. B) It is used to define lambda function
   C) it's not a keyword in python. D) None of the above
8. Which of the following is a common use case of yield keyword in python?
   A) in defining an iterator B) while defining a lambda function
   C) in defining a generator D) in for loop.

Q9 and Q10 have multiple correct answers. Choose all the correct options to answer your question.

9. Which of the following are the valid variable names?
   A) _abc B) 1abc
   C) abc2 D) None of the above
10. Which of the following are the keywords in python?
    A) yield B) raise

Q11 to Q15 are programming questions. Answer them in Jupyter Notebook.

11. Write a python program to find the factorial of a number.

ANS:-

```
def factorial(n):
if n == 0: return 1
else: return n * factorial(n - 1)
 # Input: Number to find the factorial of
number = int(input("Enter a number: "))
# Ensure the number is non-negative
 if number < 0:
 print("Factorial is not defined for negative numbers.")
 else:
# Calculate and display the factorial
result = factorial(number)
 print(f"The factorial of {number} is {result}.")
```

12. Write a python program to find whether a number is prime or composite.

ANS12:-

```
def is_prime(n):
    """Check if a number is prime."""
    if n <= 1:
        return False
    if n <= 3:
        return True
    if n % 2 == 0 or n % 3 == 0:
        return False
    i = 5
    while i * i <= n:
        if n % i == 0 or n % (i + 2) == 0:
            return False
        i += 6
    return True

def main():
    try:
        number = int(input("Enter a number: "))
        if number <= 0:
            print("Please enter a positive integer.")
        elif is_prime(number):
            print(f"{number} is a prime number.")
        else:
            print(f"{number} is a composite number.")
    except ValueError:
        print("Invalid input. Please enter an integer.")

if __name__ == "__main__":
    main()
```

13. Write a python program to check whether a given string is palindrome or not.

ANS13:-

```
def is_palindrome(s):
    """Check if the given string is a palindrome."""
    # Remove non-alphanumeric characters and convert to lowercase
    cleaned_str = ''.join(c.lower() for c in s if c.isalnum())
    # Check if the cleaned string is equal to its reverse
    return cleaned_str == cleaned_str[::-1]

def main():
    user_input = input("Enter a string: ")
    if is_palindrome(user_input):
        print(f"'{user_input}' is a palindrome.")
    else:
        print(f"'{user_input}' is not a palindrome.")

if __name__ == "__main__":
    main()
```

14. Write a Python program to get the third side of right-angled triangle from two given sides.

ANS14:-

```
import math

def calculate_third_side(side1, side2):
    """Calculate the third side of a right-angled triangle given two sides."""
```

```
    if side1 <= 0 or side2 <= 0:
        return "Side lengths must be positive numbers."

    # Check if one of the sides is the hypotenuse
    if side1 > side2:
        # side1 is the hypotenuse
        return math.sqrt(side1**2 - side2**2)
    elif side2 > side1:
        # side2 is the hypotenuse
        return math.sqrt(side2**2 - side1**2)
    else:
        # Both sides are legs
        return math.sqrt(side1**2 + side2**2)

def main():
    try:
        side1 = float(input("Enter the length of the first side: "))
        side2 = float(input("Enter the length of the second side: "))

        if side1 <= 0 or side2 <= 0:
            print("Side lengths must be positive numbers.")
            return

        # Determine which calculation to perform
        if side1 > side2:
            third_side = calculate_third_side(side1, side2)
            print(f"The length of the other leg is: {third_side:.2f}")
        else:
            third_side = calculate_third_side(side2, side1)
            print(f"The length of the hypotenuse is: {third_side:.2f}")

    except ValueError:
        print("Invalid input. Please enter numeric values.")

if __name__ == "__main__":
    main()
```

15. Write a python program to print the frequency of each of the characters present in a given string.

Ans15:-

```
from collections import Counter

def print_character_frequencies(s):
    """Print the frequency of each character in the string."""
    # Use Counter to count character frequencies
    frequency = Counter(s)

    # Print each character and its frequency
    for char, count in frequency.items():
        print(f"'{char}': {count}")

def main():
    user_input = input("Enter a string: ")
    print_character_frequencies(user_input)

if __name__ == "__main__":
    main()
```