**Lesson 11:Research Work**

1. What is the difference between math.floor() and math.ceil()?

The math.floor() function returns the largest integer that is less than or equal to the given number. In other words, it rounds the number **down** to the nearest whole number. On the other hand, the math.ceil() function returns the smallest integer that is greater than or equal to the given number, meaning it rounds the number **up** to the nearest whole number. Both functions are part of Python’s math module and are used for different types of rounding based on the direction required.

1. How is datetime.timedelta() useful in real-time applications?

The datetime.timedelta() class is used to calculate the difference between two dates or times. It helps in adding or subtracting specific time durations like days, hours, or minutes. This is useful in real-time applications such as setting deadlines, scheduling events, handling session expiration, and creating countdown timers. It ensures accurate time-based operations, making it essential for time-sensitive tasks.

1. Explain how calendar.weekday() works?

The calendar.weekday() function in Python returns the **day of the week** as an integer for a

given date. It takes three arguments: **year**, **month**, and **day**, and returns a number from **0 (Monday) to 6 (Sunday)**. For example, calendar.weekday(2025, 7, 20) will return 6 because July 20, 2025, falls on a Sunday. This function is useful when you need to determine the day of the week for scheduling or organizing events.

4..Why is the math module needed when Python has \*\* for power?

While Python’s \*\* operator can calculate powers (like 2 \*\* 3 = 8), the math module provides the math.pow() function, which offers **additional precision and features**. Unlike \*\*, which returns an integer when both inputs are integers, math.pow() always returns a **floating-point number** and handles very large or very small numbers more gracefully. Also, the math module includes other useful mathematical functions (like square root, trigonometry, logarithms), making it essential for more advanced or scientific calculations where accuracy and consistency are critical.

1. How do you format dates for display or reports?

To format dates for display or reports in Python, you use the strftime() method from the datetime module. This method allows you to convert a datetime object into a string in a specific format. For example, date.strftime("%d-%m-%Y") formats the date as day-month-year. Common format codes include %d for day, %m for month, %Y for full year, and %H:%M for time. This is useful for creating readable dates in reports, logs, user interfaces, or file names.