Python Programming for Artificial Intelligence (24CAI1101)

Lab No.	Topic(s)
9-14	**Conditional statements and loops:** Coding problems related to for/while loops, For loop and range methods, Break, continue, and pass. Case studies of printing multiple patterns like triangular, circular, rectangular, and pyramids using for & while

Coding problems related to conditional statements (if, elif, nested if else) and match statement.

1. Classify a number as even or odd.
2. Classify a number as negative or positive.
3. Determine the largest of two numbers.
4. Determine the smallest of two numbers.
5. Check if a person is eligible to vote based on age (>= 18).
6. Check if a character is a vowel or consonant.
7. WAP to print the total salary of an employee based on if the salary is more than 10000 then bonus 10% else 5%.
8. WAP to display a message “Excellent or Good” based on average of three marks for three subjects. if average is below 80 then Good else Exellent.
9. Determine the largest of three numbers.
10. Check if a given year is a leap year.
11. Determine if a number is positive, negative, or zero.
12. Check if a character is a vowel or consonant.
13. Determine if a number is divisible by both 3 and 5.
14. Find the smallest of four numbers.
15. Check if a triangle is equilateral, isosceles, or scalene based on side lengths.
16. Determine the day of the week based on a number input (1-7).
17. Determine the name of the month based on a number input (1-12).

For/While Loops:

1. Print the first 10 natural numbers.
2. Print the first n natural numbers.
3. Print sum of natural numbers up to n.
4. Calculate the sum of all even numbers from 1 to 100.

5. Find the factorial of a given number.
6. Print the multiplication table of a given number.
7. For Loop and Range Method:
8. **Print all numbers from 1 to 50 that are divisible by 7.**
9. Generate a list of squares of numbers from 1 to 10 using a for loop.
10. Print all odd numbers between two given numbers.
11. Check whether a number is prime or not
12. **To count the number of vowels and consonants for the n characters entered by user**
13. Check whether a number is perfect or not.
14. **Check whether a number is a perfect number or not. A perfect number is a rare and beautiful thing: it is equal to the sum of its proper divisors, the numbers that divide it evenly except itself. Example: 28: 1+2+4+7+14 is a perfect number**

Break, Continue, and Pass:

1. Print numbers from 1 to 10, but stop if the number is 5 (use break).
2. Skip printing the number 5 in a loop from 1 to 10 (use continue).
3. Iterate over a list of numbers and pass over any negative numbers.
4. Print all the numbers from x to y skipping if the number is multiples of 3 and 5
5. Sum of n numbers (entered by user) but stop if a user enters a -ve number.

Nested Loops:

1. Print a 3x3 grid of asterisks (*).
2. Generate a multiplication table (1-10) for numbers 1 through 5.
3. Print all pairs of numbers (i, j) where $1 \leq i, j \leq 3$.
4. Pattern Designs:
5. Print a right-angled triangle of stars with 5 rows.
6. Print an inverted triangle of numbers starting from 5.
7. Create a diamond pattern of stars with a maximum width of 5 stars.

Implementation related to Functions: User Defined and Built in functions(Python mathematical functions, random number functions), Passing Arguments(call by value/call by reference), Recursive Functions, Lambda Expressions.