OPEN SOURCE SOFTWARE LAB (15B17CI575)

Lab Assignment 3
Odd 2025 - Week 3

Topic Coverage :- String manipulation and functions

1. Write a function find_longest_word(text) that returns the longest word in the input string. Example: "Python programming is powerful" → "programming".

2. Write a function replace_middle_with_star(s) that replaces all characters between the first and last character with *. Example: "apple" → "a***e".

3. Write a function is_isogram(word) that checks if a word has all unique letters (case-insensitive). Example: "machine" → True, "letter" → False.

4. Write a function every_nth_char(s, n) that returns every nth character from the string, starting at index 0. Example: "abcdefghijk", 3 → "adgj".

5. Write a function reverse_by_words(s) that reverses the letters in each word, but keeps the word order intact. Example: Input: "hello world python" → Output: "olleh dlrow nohtyp".

6. Write a function compress_consecutive(s) that replaces sequences of the same character with that character followed by the count. Input: "aaabbccccd" → Output: "a3b2c4d1"

7. There are 10 vertical and horizontal squares on a plane. Each square is painted blue and green. Blue represents the sea, and green represents the land. When two green squares are in contact with the top and bottom, or right and left, they are said to be ground. The area created by only one green square is called "island". Write a Python function to read the mass data and find the number of islands. Input: A single data set is represented by 10 rows of 10 numbers representing green squares as 1 and blue squares as zeros. 1100000111 1000000111 0000000111 0010001000 0000011100 0000111110 0001111111 1000111110 1100011100 1110001000 Number of islands: 5

8. Write a function count_above_average(nums) that returns how many numbers in the list are above the average of the list.

9. Write a function toggle_case_count(s) that returns a dictionary with counts of upper and lower case letters and also returns a new string with all cases toggled. Example: "HeLLo" → {'upper': 3, 'lower': 2}, "hEllO".

10. Write a Python function for binary search using recursive as well as iterative methods.

11. Write a function to check whether a number is prime or not.

12. Write a function flatten_matrix(matrix) that takes a 2D list and returns a flattened 1D list. Example: [[1, 2], [3, 4]] → [1, 2, 3, 4]