**Multithreading – Thread Parameter passing and Return Handling assignments**

Mandatory

1. Create a multithreaded program to

a. read 3 lines as a single command line argument

Ans: The lines as a single string argument and split them into individual lines.

b. extract every line and pass it to a thread.

Ans: Create a thread for each line and pass the line to the thread function.

c. each thread should sort all the words in the line in ascending order and return sorted line to the main thread

Ans: Each thread will sort the words in its line and return the sorted line.

d. main thread to wait for all child threads to complete, then read and display the sorted line ”.

Ans: Use thread join to ensure the main thread waits for all child threads to complete.

e. Release any allocated memory

Ans: Ensure all dynamically allocated memory is freed.

2. Write a program to read a file name, to read lines , process it using two or more threads (i.e one thread/line) to count and display the words in the line. For this implement functions below, integrate and test solution.

//receive thread count as argument, create an array of pthread\_t (double pointer allocated memory in heap) and return pointer

a) createthreads()

//to receive filename, thread array as args, process each line using a thread function

b) process\_file()

//receive a line as input, count words and display, return line and word count to parent thread in a structure

c) thread\_proc()

Ensure that there are no memory leaks

Ans:

1. Create threads:
   * Function to create threads and return an array of thread IDs.
2. Process file:
   * Function to read the file and assign each line to a thread.
3. Thread function to count words:
   * Function to count words in a line and return the count.

3. In github or from other source, check for thread program related source code , download and test it, place the code and test cases executed with outputs. Understand , should be able to do a walkthrough in next session.

Ans:

