ID1063 Second Lab Exam
CS

Time: 3 hours

Total Marks: 5+10+10=25

1. Write a program to accept a positive integer n and prints the sum of n and the digit-reverse of n. For example, if $n = 2459$, the output is $2459 + 9542 = 12001$.

2. (a) Write a function isPrime with signature bool isPrime(void* n) that returns true if n is prime and false otherwise, after typecasting n; you may need to include stdbool.h for the bool datatype.

   (b) Create a function called filter with the following signature: size_t filter(void* output_arr, void* input_arr, size_t arr_size, size_t elem_size, bool (*pred)(const void*)), where input array is of size arr_size, size of each element is elem_size, pred is a function pointer to a function which returns a bool. The filter function copies those elements in input_arr for which predicate (pred) is true to output_arr and returns the number of elements copied.

   Test your filter function with an input array initialized to the first 100 natural numbers and the isPrime function from (a), and print the values of the output array.

3. (a) A sentence which contains all the letters of the English alphabet is called a *pangram*. For example, the sentence "A quick brown fox jumps over the lazy dog" is a pangram. Write a function that accepts a string and check whether it is a pangram or not. [Use gets to accept the sentence in a string.]

   (b) Write a program to read the file "sentences.txt" and print all the sentences which are pangrams.