Name: Saurabh Mukherjee Roll no:001910501006 Class: BCSE II Sem: First Session 2020-21

Assignment Set :1

Problem No: 7

Problem Statement :

Take a four-digit prime number *P*. Generate a series of large integers *L* and for each member *Li* compute the remainder *Ri* after dividing *Li*by *P*. Tabulate *Li* and *Ri*. Repeat for seven other four digit prime numbers keeping *Li* fixed.

Solution Approach:

We seed the random number generator function in C , rand() with time(0) using the function srand(time(0)) .Then using a for loop from 1 to 10000(say),we generate a series of the numbers using the random function generator in c and doing it modulo 10000 and add 1 to ensure the proper range. Then we take and array of 8 primes and taking one prime at a time using Array[i] where i ranges from 0 to 7 , we divide the number generated at each line and store both the numbers say Li and Ri in a file by opening it in a suitable mode (write).We repeat this for other 7 prime numbers.

Structured Pseudocode :

1.srand(time(0))

2. Initialise Array[1..8] of primes

3. For j from 1 to 8:

4. Open the file in write mode , store its address in File pointer ptr

5. if(ptr==NULL)

6. print “File can’t be opened”

7. Exit from the program

8. else

9. For i from 1 to 10000:

8. L=rand()%10000+1

9. R=L%Array[j]

10. Store both L and R in the file

11. Close the file

//Indentation refers to the scope of a particular block

Results:

In this problem we are generating random numbers series and storing it in the required file by opening the file pointer using the fopen(“filename”,”mode”) function in c and then storing the integer to the file.We are getting every time a random number say Li and after dividing with a prime P , getting the remainder say Ri for each of the number.

Discussions:

Here we will be writing directly to a file so that the data is not lost when the lifetime of the program is over .We are using the functions fopen(“filename”,”mode”) and fprintf(file pointer,”control specifier”,list of values) to open and write to the file .Even if the file doesn’t exist and we open it in the write mode a new file with “filename” will be created.

Separate files containing commented source code

The file has been attached.