**BIL 105E – Introduction to Scientific and Engineering Computing (C)**

**Spring 2015-2016**

**Homework 2 Report**

Assignment Date: 27.03.2016

Due Date: 11.04.2016, 23:00

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**Introduction:**

As stated in description of homework, we are wanted to write some functions called by reference. This functions generate random numbers using different algorithms. Also this homework aims to consolidate the usage of pointers and improve programming skills.

**Development Environment:**

My project includes 1 C file, named 150140032.c and 1 executable file, named 150140032. I wrote my code Atom editor on Mac OS, and compile it with GCC compiler in two different platforms (Mac OS and Linux). My command that I used to compile is

“gcc –lm 150140032.c –o 150140032”.

**Variables:**

range1, range2, range3, range4, range5 are used for ranges of histogram

algo, num\_samples, seed are used to store user inputs.

percent and number are used to store some calculations

\*Detailed information is in comment lines of the source code and the flowchart at next page.

**Used Funtions:**

int digits(long number) is used to determine number of digits

void mid\_rng(long \*seed) is used to generate random numbers

void lsd\_rng(long \*seed) is used to generate random numbers

void take\_samples() is used to take samples

void print\_histogram() is used to print percentiges

**Conclusion:**

This was a beneficial homework that improved my programming skills. I fully understood the usage of pointers. Actually, these were things I already knew, but still it was fun to do it. The only challenging thing about this homework was writing the report.

int function digits {

If number is zero

return 0;

return 1 + digits(number / 10);

}

void function low {

multiply the seed with 73 ;

get the last 5 digits using mod operator;

}

void function mid {

take the square of the seed;

d = number of digits in seed and calculated by digits function;

divisor = 10 ^ ((d/2)-2);

if d is greater than 5{

divide the seed by divisor;

}

Get the last 5 digits using mod operator;

}

void function take\_samples {

for (i = 0; i < num\_samples; ++i){

If algo is 1

Call mid function by reference;

Else

Call lsd function by reference;

Set number to 1 plus modulo 500 of seed;

Increase the corresponding range;

}

print "$ ­­\(num\_samples) random numbers were generated by using \(algorithm name):\n",

}

void function print\_historgram {

for every range {

calculate the percentige;

print percentige with stars;

}

int function print\_main {

read the inputs with scanf;

call the take\_samples function;

call the print\_histogram funtions;

return 0;

}