```
Script started on 2024-11-07 13:54:20-06:00 [TERM="xterm-256color" TTY="/dev/pts/6"
e_prevost@ares:~/Portfolio_2/Lab 3$ cat random.info
****************

Robert Prevost

CSC 122 W01



random number generation lab



Takes in input of filename and number amount and random generation type and

outputs a file that matches the user's specifications



Base Level: Level 2.5

Bonus for input: +1 Level

Total Level: Level 3.5

****************e_prevost@ares:~/Portfolio_2/Lab 3$ show-code random.h


random.h:
```

```cpp
#ifndef RANDOM_H
#define RANDOM_H

#include <cstdlib>
#include <ctime>

inline void initializeRandom() {
    srand(static_cast<unsigned>(time(nullptr)));
}

inline int getRandomInt(int min, int max) {
    return min + (rand() % (max - min + 1));
}

inline double getRandomDouble(double min, double max) {
    double random = static_cast<double>(rand()) / RAND_MAX;
    return min + random * (max - min);
}

inline char getRandomChar(char min, char max) {
    return static_cast<char>(min + (rand() % (max - min + 1)));
}

#endif
```

```
e_prevost@ares:~/Portfolio_2/Lab 3$ show-code driver.cpp


driver.cpp:
```

```cpp
#include <iostream>
#include <fstream>
#include <cstdlib>
#include <ctime>
#include <string>
#include <limits>
#include "random.h"

void createDataFile(const std::string& type) {
    std::string filename;
    int count;

    std::cout << "Enter filename to create: ";
    std::cin >> filename;
    std::cout << "Enter number of values to generate: ";
    std::cin >> count;

    std::ofstream outFile(filename);
    if (!outFile) {
        std::cout << "Failed to create file: " << filename << "\n";
        return;
    }

    if (type == "whole") {
        int min, max;
        std::cout << "Enter minimum character: ";
        std::cin >> min;
        std::cout << "Enter maximum character: ";
        std::cin >> max;
        for (int i = 0; i < count; i++) {
            outFile << getRandomInt(min, max) << "\n";
        }
    }
    else if (type == "decimal") {
        double min, max;
        std::cout << "Enter minimum character: ";
        std::cin >> min;
        std::cout << "Enter maximum character: ";
        std::cin >> max;
        for (int i = 0; i < count; i++) {
            outFile << getRandomDouble(min, max) << "\n";
        }
    }
    else if (type == "char") {
        char min, max;
        std::cout << "Enter minimum character: ";
```

```
    47          std::cin >> min;
    48          std::cout << "Enter maximum character: ";
    49          std::cin >> max;
    50          for (int i = 0; i < count; i++) {
    51              outFile << getRandomChar(min, max) << "\n";
    52          }
    53      }
    54
    55      outFile.close();
    56      std::cout << "File created successfully!\n";
    57  }
    58
    59  int main() {
    60      srand(static_cast<unsigned>(time(nullptr)));
    61      std::string choice;
    62
    63      while (true) {
    64          std::cout << "\n1) create random Whole number data file\n";
    65          std::cout << "2) create random Decimal number data file\n";
    66          std::cout << "3) create random Character data file\n";
    67          std::cout << "4) Quit program\n";
    68          std::cout << "Enter choice (1-4 or W/D/C/Q): ";
    69
    70          std::cin >> choice;
    71
    72          if (choice == "1" || choice == "W" || choice == "w") {
    73              createDataFile("whole");
    74          }
    75          else if (choice == "2" || choice == "D" || choice == "d") {
    76              createDataFile("decimal");
    77          }
    78          else if (choice == "3" || choice == "C" || choice == "c") {
    79              createDataFile("char");
    80          }
    81          else if (choice == "4" || choice == "Q" || choice == "q") {
    82              break;
    83          }
    84          else {
    85              std::cout << "Invalid choice. Please try again.\n";
    86          }
    87      }
    88
    89      return 0;
    90  }
e_prevost@ares:~/Portfolio_2/Lab 3$ CPP driver random
driver.cpp***


e_prevost@ares:~/Portfolio_2/Lab 3$ ./driver.out

1) create random Whole number data file
2) create random Decimal number data file
3) create random Character data file
4) Quit program
Enter choice (1-4 or W/D/C/Q): 1
Enter filename to create: banannawhole
Enter number of values to generate: 10
Enter minimum character: 2
Enter maximum character: 100
File created successfully!

1) create random Whole number data file
2) create random Decimal number data file
3) create random Character data file
4) Quit program
Enter choice (1-4 or W/D/C/Q): 2
Enter filename to create: bananadecimal
Enter number of values to generate: 100
Enter minimum character: 0
Enter maximum character: 1000
File created successfully!

1) create random Whole number data file
2) create random Decimal number data file
3) create random Character data file
4) Quit program
Enter choice (1-4 or W/D/C/Q): 3
Enter filename to create: bananacharacter
Enter number of values to generate: 5
Enter minimum character: c
Enter maximum character: o
File created successfully!

1) create random Whole number data file
2) create random Decimal number data file
3) create random Character data file
4) Quit program
Enter choice (1-4 or W/D/C/Q): 4
e_prevost@ares:~/Portfolio_2/Lab 3$ ls
bananacharacter  bananadecimal  banannawhole  driver.cpp  driver.out  random.h  ra
e_prevost@ares:~/Portfolio_2/Lab 3$ cat bananacharacter
m
k
c
o
l
e_prevost@ares:~/Portfolio_2/Lab 3$ cat bananadecimal
987.566
202.956
866.08
961.53
867.428
542.604
308.177
75.9956
694.625
749.676
499.904
```

939.225
306.889
146.527
798.161
570.358
907.389
775.541
900.654
532.042
414.746
731.465
254.55
320.157
942.628
434.929
259.098
60.9801
666.044
774.675
932.937
653.611
977.63
799.017
615.14
845.059
341.622
923.318
921.055
36.2468
672.993
420.959
975.472
979.882
567.486
773.632
550.24
474.875
549.173
450.894
6.91723
963.919
182.359
261.467
284.077
124.987
696.396
543.175
185.967
362.441
317.85
118.904
16.0511
295.481
917.921

631.192
140.539
259.543
554.509
61.594
295.79
227.502
482.553
271.261
207.385
50.0389
44.8938
757.625
524.914
594.067
208.519
531.831
557.987
390.878
793.299
842.063
515.865
489.695
385.239
701.832
852.135
703.089
820.736
868.186
998.569
738.657
499.378
139.109
998.2
53.8871
e_prevost@ares:~/Portfolio_2/Lab 3$ cat banannawhole
53
20
68
38
95
39
5
62
91
71
e_prevost@ares:~/Portfolio_2/Lab 3$ cat random.info
****

Robert Prevost

CSC 122 W01

random number generation lab

Takes in input of filename and number amount and random generation type and outputs a file that matches the user's specifications

Base Level: Level 2.5

Bonus for input: +1 Level

Total Level: Level 3.5

**********e_prevost@ares:~/Portfolio_2/Lab 3$ cat random.tpq
1. How many functions are in your random library? Are they regular or inline functions? Do you need an implementation file for your library?

there are only 4 random functions and I dont need an implementation file because I can just define them inline. Since these functions are small enough we can do this.

2. Are there any functions not immediately useful for these 4 options? Is this okay? Should you remove functions from a library just because a certain program doesn't use them?

No all these options are useful for the stuff we are going for in our program. And no functions should not be removed from a library just because a program is not using them. There is no point in removing functions in a library as that could cause bugs in other code and the other functions could be useful later on.

3. Can you show why the integer and floating point formulas given in class actually work? Please do so...

rand() generates a number between 0 and RAND_MAX. We use the modular for integers to scale our number in terms of the range of numbers from min to max and add min as a y-intercept of sorts to keep the number within the bottom range.

For floating point numbers, we want to generate a number between 0.0 and 1.0 which is accomplished using rand() / RAND_MAX. From here we can multiply that number by our range and add the min to get a number within the min and max range.

4. How many files will you have open at any time during processing of a single menu option? (Adjust this answer if you take the programming option presented below.)

Only one file is open at a time. e_prevost@ares:~/Portfolio_2/Lab 3$ exit
exit

Script done on 2024-11-07 13:56:49-06:00 [COMMAND_EXIT_CODE="0"]