```
Script started on 2023-09-25 15:33:28-05:00 [TERM="xterm" TTY="/dev/pts/2" COLUMNS=
ee43254@ares:~$ pwd
/home/students/ee43254
ee43254@ares:~$ cat dicestat.info
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Class: CSC121-001

Activity: Roll 'em, Roll 'em, Roll 'em...
Level: 3, 2 (base program) + 1 (dice notation user input)

Description:

The user inputs the number of dice and sides of the dice in dice notation. The
program then calculates the minimum, average, and maximum values that could be
rolled. It then randomly generates a dice roll that could occur.

ee43254@ares:~$ show-code dicestat.cpp


dicestat.cpp:
```

```cpp
#include <iostream>
#include <limits>
#include <string>

using namespace std;

constexpr streamsize INF_FLAG{numeric_limits<streamsize>::max()};

int main() {
        srand(static_cast<unsigned>(time(nullptr)));

        short number_of_dice, number_of_sides, random, minimum, maximum;
        double average;

        cout << "\n What is your dice roll? ";

        if( isdigit(cin.peek())) {
                cin >> number_of_dice;
                cin.ignore();
                if( isdigit(cin.peek())) {
                        cin >> number_of_sides;
                        cin.ignore(INF_FLAG, '\n');
                }
        }
        else {
                number_of_dice = 1;
                cin.ignore();
                if( isdigit(cin.peek())) {
                        cin >> number_of_sides;
                        cin.ignore(INF_FLAG, '\n');
                }
        }

        cout << "\n Thank you!! Calculating... Done.\n";

        minimum = number_of_dice;
        maximum = number_of_dice * number_of_sides;
        average = (minimum + maximum)/2.0;

        cout << "\n When rolling " << number_of_dice << " size-" << number_
        << " dice, your statistics will be: ";
        cout << "\n\t Minimum: " << minimum << "\n";
        cout << "\n\t Average: " << average << "\n";
        cout << "\n\t Maximum: " << maximum << "\n";

        random = static_cast<short>(rand() % (maximum - minimum + 1) + min

        cout << "\n A typical dice roll might result in " << random << ".\

        cout << "\n Thank you for using the DSP!!\n";
        cout << "\n Have a good day!\n";

}
```

```
ee43254@ares:~$ CPP dicestat
dicestat.cpp***


ee43254@ares:~$ ./dicestat.out

 What is your dice roll? 3d12

 Thank you!! Calculating... Done.

 When rolling 3 size-12 dice, your statistics will be:
        Minimum: 3

        Average: 19.5

        Maximum: 36

 A typical dice roll might result in 20.

 Thank you for using the DSP!!

 Have a good day!
ee43254@ares:~$ ./dicestat.out

 What is your dice roll? d12

 Thank you!! Calculating... Done.

 When rolling 1 size-12 dice, your statistics will be:
        Minimum: 1

        Average: 6.5
```

```
        Maximum: 12

 A typical dice roll might result in 11.

 Thank you for using the DSP!!

 Have a good day!
ee43254@ares:~$ ./dicestat.out

 What is your dice roll? 11d12

 Thank you!! Calculating... Done.

 When rolling 11 size-12 dice, your statistics will be:
        Minimum: 11

        Average: 71.5

        Maximum: 132

 A typical dice roll might result in 84.

 Thank you for using the DSP!!

 Have a good day!
ee43254@ares:~$ cat dicestat.tpq
TPQs
1. If you fail to call the srand function, every run of your program with the
same kind of dice roll results in the same typical roll value. Why is this?

        The rand function starts at certain spot between 0 and RAND_MAX and works
        there to always guarantee a sequence of values in those bounds.
        As a result, the same "random" number is printed.

2. Why do we nest the call to the time function inside the call to the srand
function? What is that funny argument to the time function (not its meaning,
but just what is it)?

        We nest the call to the time function inside the call to the srand
        function because it returns some value of the time function.

3. Explain how the formula derived in the notes works to generate numbers in
a specified range.

        The forumla of rand() % (b - a + 1) + a works to generate numbers in a
        specified range by taking in account of the fence-post analogy and thus
        producing numbers in the domain of [a,b].

4. Bonus:Can you verify the simple formula I gave for the average value of
 a dice roll?

        The formula can be verified by plugging in the values tested of 3d12.
        It has a maximum of 36 and a minimum of 3. Using the formula, it would
        be (3+36)/2 which should be 19.5.

More TPQs

1. How can that 'd'be extracted from between the numbers? (Notice there is no
spacing  at all between the numbers and the d!)

        'd' can be extracted from between the numbers through cin.ignore().

2. Is it important that there be no space between the numbers and the d? What
happens if there are spaces on either/both sides of the d?

        It is crucial that there be no space between the numbers and d. If there
        is space, the cin.ignore() function will possibly ignore a number.

        ee43254@ares:~$ exit
exit

Script done on 2023-09-25 15:35:58-05:00 [COMMAND_EXIT_CODE="0"]
```