

CSI 333 – Programming at the Hardware-Software Interface

Some Examples of C Programs (continued)

Handout 3.2

Program Example 5: This example is a slightly revised form of the example shown in Figure 6.9 on pages 206–207 of the text by Deitel & Deitel.

The program uses the functions `srand` and `rand` available in the standard C library. This header needed to use this library is `stdlib.h`.

```
#include <stdio.h>
#include <stdlib.h>

/* The following program rolls a six-sided die 6000 times and */
/* counts the number of times the values 1 through 6 occur.  */

#define SIZE 7
#define NUM_FACES 6
#define SEED 937
#define NUM_TRIALS 6000

int main(void) {
    int face; /* Random die value: 1 to 6. */
    int count; /* Roll counter: 1 to 6000. */
    int i; /* Temporary. */

    /* Array to keep track of frequencies. Note that array */
    /* element 0 is not used in the program. */
    int frequency[SIZE];

    /* Initialize all frequencies to 0. */
    for (i = 1; i <= NUM_FACES; i++)
        frequency[i] = 0;

    /* Initialize the random number generator with the see value. */
    srand(SEED);

    /* Roll the die 6000 times and update frequencies. */

    for (count = 1; count <= NUM_TRIALS; count++) {
        face = 1 + rand() % NUM_FACES; /* Results in a value from 1 to 6. */
        frequency[face]++;
    }
}
```

(over)

```
/* Print out the frequency values. */  
  
for (i = 1; i <= NUM_FACES; i++) {  
    printf("%3d   %5d\n", i, frequency[i]);  
}  
  
return 0;  
} /* End of main. */
```

Output:

1	938
2	993
3	1062
4	1031
5	975
6	1001