

# Homework #3 C/C++ Programming

## Due: February 8, 2014 (Saturday at 11:59 PM)

### ESP-Training Program

Bob thinks he has *extrasensory perception* (ESP), but it just needed to be developed (for more information see: [http://en.wikipedia.org/wiki/Extrasensory\\_perception](http://en.wikipedia.org/wiki/Extrasensory_perception)). He wants you to write an ESP-Traning program that does the following:

- asks the user for a maximum number (used to determine the “level” of difficulty)
- generates a random number between 1 and this maximum number (that can include 1 and the max. #)
- gives the user at most 3 chances to guess the random number (if they guess it early (e.g., guess 1 or 2), then stop)
- print a summary message of either:
  - if they successfully guessed the random number, then congratulate them **AND** report the number of needed guesses (1, 2, or 3) -- use an integer variable to count the number of guesses, or
  - if they were unsuccessful in guessing the random number with their 3 tries, then encourage them to practice with a smaller range of values, i.e., smaller maximum number

### When you write your program, be sure you:

- use meaningful variable names with good style (i.e., useCamelCase)
- use comments (`//` single-line or `/*` Multi-line Comment `*/`) at the start of the program, to label tricky blocks of code, and to explain the contents of variables
- use global constants where appropriate with good style (`ALL_CAPS_AND_UNDERSCORES`) (Put your global constants after your `#include` compiler-directives and before your main function definition so they can be found and changed easily in future versions of your program.)
- format the user interaction nicely

### Submit the single file, hw3.zip containing the following: (see directions on the back as necessary)

- `espTrainer.cpp` (your C++ program)
- `out.txt` (text file containing a “script” of your program as it runs with a user specified maximum number of 10)

### Hints:

- Use if-statement(s) to check if the users guess is correct or not
- Generalized the Lecture 5 question 1 (b) answer:  
Question: 1. Use some library functions from the lecture 3 handout to write C++ assignment statements to calculate the following formulas: ... b) Generate a random integer in the range 3 to 1000 (inclusive).

Answer:

```
#include <ctime>           // to use the time function to seed the random number generator
#include <cstdlib>        // to use the srand and rand functions
```

```
srand( time(0) );        // seeds the random generator using the current time
// Determine the number of integers in the desired range
int numberOfValuesInRange = (1000 - 3 + 1);
```

```
// Generate a random integer from 0 to the largest integer value
int potentiallyLargeRandom = rand();
```

```
// Chop the integer to the correct number of values, but starting at 0
int randValueStartingAtZero = potentiallyLargeRandom % numberOfValuesInRange;
```

```
// Shift the to the desired range of values
int randValue = randValueStartingAtZero + 3;
```

## The steps for the homework submission system are:

1. Design, write, debug, and test your program in a hw3 folder on student.cs.uni.edu. When you are ready to submit your homework:
    - copy the hw3 folder to your local computer using a secure ftp client (e.g., FileZilla, WinSCP, etc.)
    - zip the hw3 folder by right-clicking on it and selecting `Send to | Compressed (zipped) folder`. This will create a new file called `hw3.zip` which you will submit electronically. (This assumes Windows OS....)
  2. Log on to the submission system at: [https://www.cs.uni.edu/~schafer/submit/which\\_course.cgi](https://www.cs.uni.edu/~schafer/submit/which_course.cgi)  
(It is very likely that you will get some security certificate warnings when trying to use this. You may add an exception and accept the existing security certificate.) Use your CatID user-name and password.
  3. Select the course and section number of "CS 1160, C/C++ Programming, Fienup". Click the "Continue".
  4. Select the homework that you wish to submit: "HW 3: ESP Trainer". Click the "Continue" button.
  5. Specify how many extra files you want to submit. Just leave it at 0. Click the "Continue" button.
  6. Upload your program by Browsing and selecting your `hw3.zip` file. Click the "Continue" button.
  7. The next page reports on the status of the upload(s). You can always continue to upload a better version of the program until the deadline. The newer file will replace an older file of the same name.
- (If you miss the deadline, you'll need to submit it as above, but select "Late Homeworks" in step 4 above.)