

Bulls and Cows

Bulls and Cows is a guessing game where you try to guess an 'n' digit code. (Note: each number in the code must be distinct) When a number is guessed and a digit is in the correct location, then that is a bull. When a digit is in the number, but in the incorrect location, then that is a cow. So if a 3 digit code is 289, and the user guesses 829. Then that is "1 bull and 2 cows" because '9' is in the correct location and '2' and '8' are in the code but are currently in the wrong location. The guessing continues until the code is guessed in the correct order... "3 bulls"!

This website will give you a feel for the game. To emulate our version using 3 digits, click on "Options" and select any 0-9, 3 Codes. <http://www.mathsisfun.com/games/bulls-and-cows.html>

Note: Programming Project should be done primarily on your own. However, it is appropriate to get some support from your professor, and even other students. Refer to the Syllabus for guidelines. Remember to use Piazza and post your partial code if you are stuck with a problem in your code.

Requirements

- Use appropriate functions to separate basic functionality of the implementation. For example: getCode(), getGuess(), checkBulls(), checkCows() etc.
- Your program will take a 3 digit code from the following string array randomly. Use C++ random number generator function (`int i = (rand() % 10)`) to generate a number between 0 - 9 (both inclusive) and use it as an index to retrieve one of following code for the user to guess. Note: Make sure to seed your random number generator using `srand(time(0))`; method before calling random number generator method.

458	751	648	349	029	824	697	145	632	581
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- The code and guess must each be stored in a string.
- Get guess as a string.
 - If more digits than the number in the code, get number again.
 - If not enough digits, assume the missing digits to the left are zero.
For example: For a 3 digit code, 35 is the same as 035 where zero is the *first digit*.
 - If any digits are repeated, get number again.
For example: If the user guess is 335, get the number again.
- If the user enters string "quit" anytime during the play, the program should stop and display the code that the user was playing with output "Thanks for playing!"
- You must allow the program to be played repeatedly without ending the program after successful run (that is getting 3 bulls).
 - Typing 'y' or 'Y' or "Yes" causes program to run again. Anything else exits the program with output "Thanks for playing!"
- Follow formatting as demonstrated in the "Sample Output" below.
- 5 Bonus Points: Generate 3 digit random number (all distinct digits) to use in the play instead of using the 10 codes in the table above.
- Make sure you have your name and Bronco ID in the header comment


```

/* Name: Jane-Joe
* Bronco ID: 12345678
* Sources of Help: Jon Doe helped me with.....
*/

```

Example Output

```
Welcome to "Bulls and Cows"
Number to guess: ???
Enter guess: 89
2 bulls
0 cows
Enter guess: 29
3 bulls - 029 is Correct!

Enter 'y' to play again: Y
Number to guess: ???
Enter guess: 268
1 bulls
0 cows
Enter guess: 16984
"You can only enter 3 digits!"
Enter guess: 169
0 bulls
0 cows
Enter guess: 568
1 bulls
1 cows
Enter guess: 558
"Each digit must be different!"
Enter guess: 258
2 bulls
0 cows
Enter guess: 458
3 bulls - 458 is Correct!

Enter 'y' to play again: Y
Number to guess: ???
Enter guess: quit
Number to guess: 349

Thanks for playing! Goodbye.
```

Due: Submit your .cpp file to Blackboard. December 02, 2016 by 4.00 PM

Total Points = 100 + 5 Bonus Points

- Correctness/Robustness: 60 points
- Code complies to requirements: 20 points
- Good coding style: 20 points