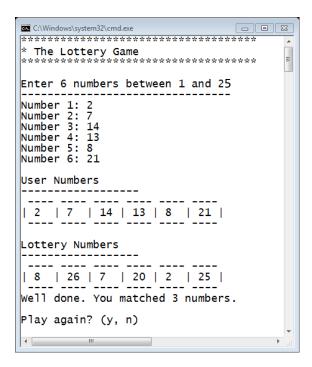# CS150 Assignment 6
Lottery

Date assigned: Wednesday, November 5, 2014
Date due: Friday, November 14, 2014, 1pm (40 points)

For this assignment, you will write a complete C++ program that simulates a lottery. Users must enter 6 numbers between 1 and 25, and these are then compared to 6 random lottery numbers.

Sample Run:

```
C:\Windows\system32\cmd.exe
**********************************
* The Lottery Game
**********************************

Enter 6 numbers between 1 and 25
---------------------------------
Number 1: 12
Number 2: 45
Number 2: 9
Number 3: 15
Number 4: 12
Number 4: 4
Number 5: -8
Number 5: 22
Number 6: 24

User Numbers
------------------
 ---- ---- ---- ---- ---- ----
| 12 | 9  | 15 | 4  | 22 | 24 |
 ---- ---- ---- ---- ---- ----

Lottery Numbers
------------------
 ---- ---- ---- ---- ---- ----
| 3  | 24 | 18 | 5  | 22 | 17 |
 ---- ---- ---- ---- ---- ----
You only matched 2 number(s).

Play again? (y, n)
```

```
C:\Windows\system32\cmd.exe
**********************************
* The Lottery Game
**********************************

Enter 6 numbers between 1 and 25
---------------------------------
Number 1: 11
Number 2: 12
Number 3: 13
Number 4: 14
Number 5: 15
Number 6: 16

User Numbers
------------------
 ---- ---- ---- ---- ---- ----
| 11 | 12 | 13 | 14 | 15 | 16 |
 ---- ---- ---- ---- ---- ----

Lottery Numbers
------------------
 ---- ---- ---- ---- ---- ----
| 17 | 24 | 19 | 6  | 10 | 3  |
 ---- ---- ---- ---- ---- ----
You did not match any numbers. Better luck next time.

Play again? (y, n)
```

```
C:\Windows\system32\cmd.exe                          ─ □ 23
************************************
* The Lottery Game
************************************

Enter 6 numbers between 1 and 25
----------------------------------
Number 1: 2
Number 2: 7
Number 3: 14
Number 4: 13
Number 5: 8
Number 6: 21

User Numbers
------------------
 ----  ----  ----  ----  ----  ----
| 2   | 7   | 14  | 13  | 8   | 21  |
 ----  ----  ----  ----  ----  ----

Lottery Numbers
------------------
 ----  ----  ----  ----  ----  ----
| 8   | 26  | 7   | 20  | 2   | 25  |
 ----  ----  ----  ----  ----  ----
Well done. You matched 3 numbers.

Play again? (y, n)
```

Notes:

- Balls are matched in any order.

- Balls range in value from 1-25. You must validate this both for the user input and for the randomly generated numbers.

- Numbers are never repeated in a single draw. You must verify that the user doesn't enter the same number twice and that the same number is not randomly generated for the lottery numbers.

- You must display the following messages based on the results:
  - 0 matches: "You did not match any numbers. Better luck next time."
  - 1-2 matches: "You only matched x number(s)."
  - 3-4 matches: "Well done. You matched x numbers."
  - 5-6 matches: "Amazing!! You matched x numbers."

- Your program must continue playing the lottery while the user selects y or Y.

- Clear the screen between plays using system ("cls");

Remember

- Code and test one function at a time.

- The debugger is your friend!

Optional extra credit (5 pts)

For extra credit, sort the user numbers and the lottery numbers before displaying them to the screen.

You must use the following functions:

- **void displayHeading(string heading);**

  Prints the **heading** passed to the function, including the border of stars, to the screen.

- **void getUserNumbers(int userNumbers[], int numBalls, int maxValue);**

  Reads in **numBalls** ball numbers from the user and places them in the array **userNumbers**. **numBalls** is the number of white ball numbers to be read in (6 in this case) and **maxValue** is the maximum value for the white balls (25 in this case).

- **void getLotteryNumbers(int lotteryNumbers[], int numBalls, int maxValue);**

  Randomly generates **numBalls** ball numbers and places them in the array **lotteryNumbers**. **numBalls** is the number of white ball numbers to be read in (6 in this case) and **maxValue** is the maximum value for the white balls (25 in this case).

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- **void displayNumbers(int numbers[], int numBalls, string heading);**

  Prints to the screen the **heading** followed by dashes followed by the values of **numBalls** balls that are stored in **numbers**. Your output must look like the sample output.

- **void calculateMatches(int userNumbers[], int lotteryNumbers[], int numBalls, int &numMatches);**

  Compares the values in **userNumbers** with the values in **lotteryNumbers**. **numMatches** will contain the number of balls that matched.

- **void displayMessage(int numMatches)**

  Displays the appropriate message based on the **numMatches**.
    - 0 matches: "You did not match any numbers. Better luck next time."
    - 1-2 matches: "You only matched x number(s)."
    - 3-4 matches: "Well done. You matched x numbers."
    - 5-6 matches: "Amazing!! You matched x numbers."

To complete this assignment you must submit the following:

1. **An electronic copy of your program on Grace**

   a. Add a new project named **06_Lottery** to your previously created assignment solution called PUNetIDAssignments. It is *vital* that you name your project correctly!

   b. Type your program (fully documented/commented) into the project. We are now commenting each function in a program. You must follow the coding standards!

   c. Pay attention to the example output! Your program's output must look **exactly** like the example output! The spacing and newlines in your output must match exactly.

   d. Make sure that your program compiles and runs correctly. If you get any errors, double check that you typed everything correctly.

   e. Make sure that your program does not produce any warnings.

   f. Once you are sure that the program works correctly it is time to submit your program. You do this by logging on to Grace and placing your complete solution folder in the **CS150-01 Drop** folder. This solution folder must contain seven projects.

   g. The program must be in the drop folder by 1pm on the day that it is due. Anything submitted after that will be considered late.

2. **A hard copy of your program**

   a. The hard copy must be placed on the instructor's desk by 1pm on the day that it is due.

   b. The hard copy must be printed in color, double-sided, and stapled if necessary.

   c. Your tab size must be set to 2 and you must not go past column 80 in your output.

   Good luck! And remember, if you have any problems, come and see me straight away. ☺