Assignment: **#GuessingGame**	Due: **03/03/02019**	Points: **6**

Specification

Write a program that enables a user to play number guessing games. The following is a nutshell description of a number guessing game.

```
+ a random number is generated
+ loop prompting the user to enter guesses
  until the user guesses the number or hits
  the maximum number of allowed guesses or
  enters the "quit" sentinel value
```

The rest of this specification documents number guessing games in more detail. The documentation uses manifest constants that can be used by your program.

Playing a Guessing Game

Use a **`class Random`** object to get a random number between MIN_NUMBER (1) and MAX_NUMBER (205), inclusive.

Print the ENTER_GUESS_PROMPT and read the user input. Loop until one of the following are true.

```
+ the user enters the random number
  - print WINNER_MSG along with number of guesses

+ the user enters MAX_GUESSES (10) wrong guesses
  - print LOSER_MSG along with the random number

+ the user enters QUIT_VALUE (-1)
  - print QUITTER_MSG

The current game ends in all three of these cases.
(see "End of Game Processing" section)
```

If the user enters BACKDOOR_VALUE (-314), print the random number and re-prompt the user to enter a guess. BACKDOOR_VALUE input is not counted as a wrong guess.

Print a INPUT_TOO_SMALL_MSG or INPUT_TOO_LARGE_MSG message when the user enters a number that is either less than MIN_NUMBER or greater than MAX_NUMBER, respectively. Re-prompt the user to enter a guess after printing the message. Invalid inputs are not counted as wrong guesses.

Print a NOPE_NOPE_MSG message when the user enters a wrong guess more than once and re-prompt the user to enter a guess. Duplicate wrong guesses are not counted as wrong guess.

Print a NOPE_MSG when the user enters a wrong guess. At HINT_THRESHOLD (5) wrong guesses, print a HIGHER_MSG or LOWER_MSG message. Re-prompt the user to enter a guess.

End of Game Processing

If number of games played equals MAX_GAMES (4), then do "Post Game Playing Processing." Otherwise, issue the PLAY_AGAIN_PROMPT. Do "Post Game Playing Processing" if user enters 'n', else start new game.

Post Game Playing Processing

Print the following prior to exiting the program.

- number of games played
- number of games won
- number of games lost
- number of games quit
- winning percentage

Also print game summaries for each game played.

```
games played: 3; won: 1; lost: 1; quit: 1; winning pct.: 33.33%

game 1: Won; the number was: 145; #guesses: 6; backdoored: true
...guesses in ascending order: 1,2,3,4,5,

game 2: Quit; the number was: 49; #guesses: 3; backdoored: false
...guesses in ascending order: 1,2,3,

game 3: Lost; the number was: 182; #guesses: 10; backdoored: true
...guesses in ascending order: 1,5,144,150,181,183,191,199,200,201,
```

Manifest Constants

Your program can implements I_GG to use the manifest constants defined in the interface. I_GG can be copied/pasted after (or before) the declaration of your class.

To Support Testing (i.e. test mode)

If the program is executed with a command-line argument, then the random number for each game is DFLT_NUMBER (60).

The motivation for supporting test mode is to play games without having to play games.

```
shell-prompt: cat gg.in
-314 10 20 30 foo 40 50 70 60 y
10 20 10 0 210 -1 y
1 2 3 4 5 6 7 8 9 10 11 12 y
1 2 3 1 2 60 w y
```

```
  shell-prompt: cat gg.in | java GG testing > gg.out
```

Example Games

```
*** Hello! Have fun playing the CSC205AA guessing game. ***

enter a guess between 1 and 205 (-1 to quit): 1      // ENTER_GUESS_PROMPT
nope...                                              // NOPE_MSG
enter a guess between 1 and 205 (-1 to quit): 2
nope...
enter a guess between 1 and 205 (-1 to quit): 3
nope...
enter a guess between 1 and 205 (-1 to quit): 4
nope...
enter a guess between 1 and 205 (-1 to quit): 5
nope... higher                                       // NOPE_MSG with hint
enter a guess between 1 and 205 (-1 to quit): 3
you've already guessed that wrong guess...           // NOPE_NOPE_MSG
enter a guess between 1 and 205 (-1 to quit): 314
*** invalid input -- must be less than 206           // INPUT_TOO_LARGE_MSG
enter a guess between 1 and 205 (-1 to quit): -5
*** invalid input -- must be greater than 0          // INPUT_TOO_SMALL_MSG
enter a guess between 1 and 205 (-1 to quit): -314
...the number is 145
enter a guess between 1 and 205 (-1 to quit): 145
you're a winner... # of guesses: 6                   // WINNER_MSG

Do you want to play again (n or y)? y                // PLAY_AGAIN_PROMPT

enter a guess between 1 and 205 (-1 to quit): 1
nope...
enter a guess between 1 and 205 (-1 to quit): 2
nope...
enter a guess between 1 and 205 (-1 to quit): 3
nope...
enter a guess between 1 and 205 (-1 to quit): -1
you're a quitter... the number was 49                // QUITTER_MSG

Do you want to play again (n or y)? what
*** invalid input -- must be n or y                  // NOT_YN_MSG

Do you want to play again (n or y)? y

enter a guess between 1 and 205 (-1 to quit): -314
...the number is 182
enter a guess between 1 and 205 (-1 to quit): 150
nope...
enter a guess between 1 and 205 (-1 to quit): 200
nope...
enter a guess between 1 and 205 (-1 to quit): 1
nope...
enter a guess between 1 and 205 (-1 to quit): 5
nope...
enter a guess between 1 and 205 (-1 to quit): 200
you've already guessed that wrong guess...
enter a guess between 1 and 205 (-1 to quit): 206
*** invalid input -- must be less than 206
enter a guess between 1 and 205 (-1 to quit): 0
*** invalid input -- must be greater than 0
enter a guess between 1 and 205 (-1 to quit): 144
nope... higher
enter a guess between 1 and 205 (-1 to quit): foo
*** invalid input -- must be an whole number
enter a guess between 1 and 205 (-1 to quit): 201
nope... lower
enter a guess between 1 and 205 (-1 to quit): 183
nope... lower
enter a guess between 1 and 205 (-1 to quit): 200
you've already guessed that wrong guess...
enter a guess between 1 and 205 (-1 to quit): 199
nope... lower
enter a guess between 1 and 205 (-1 to quit): -314
...the number is 182
enter a guess between 1 and 205 (-1 to quit): 181
nope... higher
enter a guess between 1 and 205 (-1 to quit): 191
too many guesses entered... the number was 182       // LOSER_MSG

Do you want to play again (n or y)? n

*** Thanks for playing the CSC205AA guessing game. ***

games played: 3; won: 1; lost: 1; quit: 1; winning pct.: 33.33%

game 1: Won; the number was: 145; #guesses: 6; backdoored: true
...guesses in ascending order: 1,2,3,4,5,

game 2: Quit; the number was: 49; #guesses: 3; backdoored: false
...guesses in ascending order: 1,2,3,

game 3: Lost; the number was: 182; #guesses: 10; backdoored: true
...guesses in ascending order: 1,5,144,150,181,183,191,199,200,201,
```

Example Games (second round to test MAX_GAMES played)

```
*** Hello! Have fun playing the CSC205AA guessing game. ***
```

```
enter a guess between 1 and 205 (-1 to quit): -1
you're a quitter... the number was 157

Do you want to play again (n or y)? y

enter a guess between 1 and 205 (-1 to quit): -1
you're a quitter... the number was 4

Do you want to play again (n or y)? y

enter a guess between 1 and 205 (-1 to quit): -314
...the number is 35
enter a guess between 1 and 205 (-1 to quit): 35
you're a winner... # of guesses: 1

Do you want to play again (n or y)? y

enter a guess between 1 and 205 (-1 to quit): -1
you're a quitter... the number was 118

Maximum number (4) of games have been played.

*** Thanks for playing the CSC205AA guessing game. ***

games played: 4; won: 1; lost: 0; quit: 3; winning pct.: 25.00%

game 1: Quit; the number was: 157; #guesses: 0; backdoored: false

game 2: Quit; the number was: 4; #guesses: 0; backdoored: false

game 3: Won; the number was: 35; #guesses: 1; backdoored: true

game 4: Quit; the number was: 118; #guesses: 0; backdoored: false
```

Example Games (test mode)

```
*** Hello! Have fun playing the CSC205AA guessing game. ***

enter a guess between 1 and 205 (-1 to quit): -314
...the number is 60
enter a guess between 1 and 205 (-1 to quit): 10
nope...
enter a guess between 1 and 205 (-1 to quit): 20
nope...
enter a guess between 1 and 205 (-1 to quit): 30
nope...
enter a guess between 1 and 205 (-1 to quit): foo
*** invalid input -- must be an whole number
enter a guess between 1 and 205 (-1 to quit): 40
nope...
enter a guess between 1 and 205 (-1 to quit): 50
nope... higher
enter a guess between 1 and 205 (-1 to quit): 70
nope... lower
enter a guess between 1 and 205 (-1 to quit): 60
you're a winner... # of guesses: 7

Do you want to play again (n or y)? y

enter a guess between 1 and 205 (-1 to quit): 10
nope...
enter a guess between 1 and 205 (-1 to quit): 20
nope...
enter a guess between 1 and 205 (-1 to quit): 10
you've already guessed that wrong guess...
enter a guess between 1 and 205 (-1 to quit): 0
*** invalid input -- must be greater than 0
enter a guess between 1 and 205 (-1 to quit): 210
*** invalid input -- must be less than 206
enter a guess between 1 and 205 (-1 to quit): -1
you're a quitter... the number was 60

Do you want to play again (n or y)? y

enter a guess between 1 and 205 (-1 to quit): 1
nope...
enter a guess between 1 and 205 (-1 to quit): 2
nope...
enter a guess between 1 and 205 (-1 to quit): 3
nope...
enter a guess between 1 and 205 (-1 to quit): 4
nope...
enter a guess between 1 and 205 (-1 to quit): 5
nope... higher
enter a guess between 1 and 205 (-1 to quit): 6
nope... higher
enter a guess between 1 and 205 (-1 to quit): 7
nope... higher
enter a guess between 1 and 205 (-1 to quit): 8
nope... higher
enter a guess between 1 and 205 (-1 to quit): 9
nope... higher
enter a guess between 1 and 205 (-1 to quit): 10
too many guesses entered... the number was 60

Do you want to play again (n or y)? 11
*** invalid input -- must be n or y

Do you want to play again (n or y)? 12
```

```
*** invalid input -- must be n or y

Do you want to play again (n or y)? y

enter a guess between 1 and 205 (-1 to quit): 1
nope...
enter a guess between 1 and 205 (-1 to quit): 2
nope...
enter a guess between 1 and 205 (-1 to quit): 3
nope...
enter a guess between 1 and 205 (-1 to quit): 1
you've already guessed that wrong guess...
enter a guess between 1 and 205 (-1 to quit): 2
you've already guessed that wrong guess...
enter a guess between 1 and 205 (-1 to quit): 60
you're a winner... # of guesses: 4

Maximum number (4) of games played.

*** Thanks for playing the CSC205AA guessing game. ***

games played: 4; won: 2; lost: 1; quit: 1; winning pct.: 50.00%

game 1: Won; the number was: 60; #guesses: 7; backdoored: true
...guesses in ascending order: 10,20,30,40,50,70,

game 2: Quit; the number was: 60; #guesses: 2; backdoored: false
...guesses in ascending order: 10,20,

game 3: Lost; the number was: 60; #guesses: 10; backdoored: false
...guesses in ascending order: 1,2,3,4,5,6,7,8,9,10,

game 4: Won; the number was: 60; #guesses: 4; backdoored: false
...guesses in ascending order: 1,2,3,
```