Objectives and instructions

You will implement a “Challenge Edition” of the game “21.” This Challenge Edition does not replace the original Project 6, so work on and submit separately the Challenge Edition after you have submitted your files for the original Project 6. Once again, be sure to make a separate directory (folder) to store all the files for the Challenge Edition of the game.

In the Challenge Edition, you will make changes to three classes—Hand, Dealer, and TwentyOne—to add the following features into our game 21:

1. Only the first card that the dealer gets is shown at the beginning of a round of game.
   See the example output at the end of the document. In the original P6, both cards that the dealer gets at the beginning of a round are shown. In the Challenge Edition, the second card is displayed as empty brackets [] at the beginning. Note: a second card must be dealt to the dealer at the beginning of the a round—do not try to circumvent the printing by not dealing the second card.

2. Any number of players may be specified at the start of the entire game (i.e., you will not use the constant TwentyOne.NUM_PLAYERS). If the dealer runs out of cards (i.e., its deck goes empty) it will get another deck of cards.
   Note that the dealer still starts every round of play with a fresh deck, like in the original Project 6. A message should be displayed when the dealer gets another deck of cards, see example output.

3. An Ace can be counted as either 11 or 1 in determining a hand’s value.
   The dealer will always choose the higher number (11) when given an Ace and the rest of its hand has a value less than or equal to 10. (So 10 + Ace gives Blackjack!) If the dealer gets an Ace when the rest of its hand has a value greater than 10, then it treats the Ace as 1.

Successful completion of each of the above features will earn one point, so you may get up to three points. We have high standards for challenge problems! We will grade the your challenge submission only if all your program files compile and run—no exceptions. You must identify the changes in your code using comments, as described below. Furthermore, the new features should be incorporated with minimal changes to your original P6 game of 21, and we expect you to follow good programming and OOP practices (style) in developing your code. Submit the files Hand.java, Dealer.java, and TwentyOne.java under Project 6 Challenge on CMS before the deadline.

Identifying code that relates to the Challenge Edition

In the comment block that precedes your class definition, briefly describe the changes that you have made to incorporate the features in the Challenge Edition:

- List any new methods and variables you have added to the class
- Identify any revised methods (compared to original Project 6) and briefly describe the revisions.

Example output

We show the output related to the features of the Challenge Edition below—repetitive lines of output for 11 of the 15 players have been cut out (...snip...).
Welcome to TwentyOne.

How many players are there? 15
What is player #1's name? p1
What is player #2's name? p2

... snip ...

What is player #14's name? p14
What is player #15's name? p15

Dealer's hand: JACK-C [ ] _ _ _
p1's hand: 5-C ACE-H _ _ _
p2's hand: JACK-H JACK-S _ _ _

... snip ...
p14's hand: JACK-D 7-C _ _ _
p15's hand: 2-S KING-D _ _ _

p1's hand: 5-C ACE-H _ _ _
What would p1 like to do?
(1:HIT  2.STAY  3.QUIT) 1

p1's hand: 5-C ACE-H 5-S _ _
What would p1 like to do?
(1:HIT  2.STAY  3.QUIT) 2

p2's hand: JACK-H JACK-S _ _ _
What would p2 like to do?
(1:HIT  2.STAY  3.QUIT) I
p2 busted.

... snip ...
p13's hand: 10-H ACE-D _ _ _
What would p13 like to do?
(1:HIT  2.STAY  3.QUIT) 2

p14's hand: JACK-D 7-C _ _ _
What would p14 like to do?
(1:HIT  2.STAY  3.QUIT) 1

****************************** Filling new deck...
p14's hand: JACK-D 7-C 2-D _ _
What would p14 like to do?
(1:HIT  2.STAY  3.QUIT) 2

p15's hand: 2-S KING-D _ _ _
What would p15 like to do?
(1:HIT  2.STAY  3.QUIT) I

p15's hand: 2-S KING-D 8-C _ _
What would p15 like to do?
(1:HIT  2.STAY  3.QUIT) 2

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Dealer's hand: JACK-C 6-C 10-C _ _
Dealer Busted.
p1's hand: 5-C ACE-H 5-S _ _
p1 won.
p2's hand: JACK-H JACK-S KING-S _ _
p2 lost.

... snip ...
p13's hand: 10-H ACE-D _ _ _
p13 won.
p14's hand: JACK-D 7-C 2-D _ _
p14 won.
p15's hand: 2-S KING-D 8-C _ _
p15 won.

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Would you like to play again? n
p1 won 1 and lost 0 games.
p2 won 0 and lost 1 games.

... snip ...
p14 won 1 and lost 0 games.
p15 won 1 and lost 0 games.

Goodbye