

**National University of Sciences & Technology**  
**School of Electrical Engineering and Computer Science**  
**Department of Computing**  
**CS 110: Fundamentals of Computer Programming (3+1), Fall 2018**

<b>Assignment 3</b>	
<b>CLO2: Understand basic algorithms for identifying and solving real world problems</b>	
Maximum Marks: 20	Instructor: Sana Khalique
Announcement Date: 15 <sup>th</sup> November 2018	<b>Due Date : 23<sup>rd</sup> November 2018</b>

**Instructions:**

You are encouraged to use good programming conventions by entering appropriate comments, using indentations, and using descriptive variable names in your programs.

**Hand-in**

Name your .c file as [firstnameLastnameSection].c. For example my assignment name would be sanakhaliqueA.c if my section is A. Upload on LMS. If you can't upload the .c file copy the code on word document and upload a sanakhaliqueA.doc file. Don't paste the screenshots

**Honor code**

- The student should agree to the terms below; any infringements will result in zero marks.
- will not cheat on project
- will not share solutions to the project; and
- will notify the instructor immediately if he or she becomes aware of any other group cheating
- The deadline is strictly to be followed

Best of Luck

Blackjack is a card game in which the objective is to get a hand that is as close as possible to **21**, without going over. This casino game is also called 21.

- A player starts out with **two cards** and can request more cards, one at a time.
- Numeric cards have their numeric value, and all face cards (K,Q,J) have value 10.
- An ace (A) has the value 1 or 11, which ever value is more advantageous to the user . **For example**, a hand with two aces and one five has the value of  $11 + 1 + 5 = 17$ . In this case, the second ace is counted as a value of 1, since if it were counted 11 the hand value would be 27.

#### **blackjack hand**

A two-card hand with an ace and 10 is always counted as 21, and is called a "blackjack" hand.

- The **user of the program is the player** and the program acts as the dealer. The program begins by dealing two cards each to the player and the dealer. The values of player's cards are shown. The value of one of the dealer's card is shown, with the other value hidden until the hand is over. The hidden dealer card is called the "**hole**" card. Once the player's hand is dealt, the **player inputs** the following one-character commands:

h		take another card
s		dealers play (dealers turn, only one turn and game is concluded)
q		quit hand
- If the player's hand value goes above 21, the player "**busts**" and loses the hand. The dealer reveals the hole card,
- If the player does not bust, or the player's hand reaches a value of 21, then the dealer plays. This is done by the dealer taking cards until the dealer's hand value is 17 or higher or the dealer busts. At the conclusion of dealer play all dealer cards are revealed, including the hole card.
- If neither the player nor dealer busts, then the winning hand is the one with the higher value. If the hand values are the same, then the hand is a tie, which is called a "**push**". A two-card **blackjack hand** beats a hand of value 21 with more than two cards.
- The dealer's hole card is displayed as 'X'. When the player's hand value reaches 21, the player is not prompted for a command, and the dealer's play commences automatically.
- If the player uses the 'q' command, the player loses immediately. The dealer does not play, and the hole card is not revealed. The dealer wins

### Sample Basic Play

Player's Hand: 3, J  
Dealer's Hand: 5, X

Enter command: h

Player's Hand: 3, J, 9  
Dealer's Hand: 5, 2

Player busts.

Enter 'q' to quit, anything else to play another game c

Player's Hand: K, 8  
Dealer's Hand: 9, X

Enter command: s

Player's Hand: K, 8  
Dealer's Hand: 9, 3, 10

Dealer busts.

Enter 'q' to quit, anything else to play another hand: c

Player's Hand: 2, 4  
Dealer's Hand: Q, X

Enter command: h

Player's Hand: 2, 4, 10  
Dealer's Hand: Q, X

Enter command: h  
Player's Hand: 2, 4, 10, 3  
Dealer's Hand: Q, X

Enter command: s  
Player's Hand: 2, 4, 10, 3  
Dealer's Hand: Q, J

Dealer wins.

Enter 'q' to quit, anything else to play another hand: c

Player's Hand: A, Q  
Dealer's Hand: 3, 8, 10

Player wins.

Enter 'q' to quit, anything else to play another hand: c

Player's Hand: 2, 2  
Dealer's Hand: 5, X

Enter command: h

Player's Hand: 2, 2, 4  
Dealer's Hand: 5, X

Enter command: h

Player's Hand: 2, 2, 4, 4  
Dealer's Hand: 5, X

Enter command: h

Player's Hand: 2, 2, 4, 4, 4  
Dealer's Hand: 5, X

Enter command: s

Player's Hand: 2, 2, 4, 4, 4  
Dealer's Hand: 5, 10, 5

Dealer wins.

Enter 'q' to quit, anything else to play another hand: c

Player's Hand: 6, 2  
Dealer's Hand: 7, X

Enter command: q

Dealer wins.

Enter 'q' to quit, anything else to play another hand: q

Total Score  
Dealer wins=3  
Player wins=1