/*
Week 8:  Blackjack
Programmer: Tony Dobele
Filename: Card.java
Purpose: This is an external class called by the Blackjack.java program.
Its constructor method receives the suit and value and creates a card image filename.
*/

public class Card
{
    public String suit;
    public int value;
    String image;

    public Card (String cardSuit, int cardValue)
    {
        suit = cardSuit;
        value = cardValue;
        image = (value + suit + "\.gif");
        // although suit is only 1 character,
        // a char type instead of a String would not work here
    }
}

public class Deck
{
    Card[] deck = new Card[52]; // an array of 52 Card objects
    int cardPos = 0;

    public Deck() // constructor
    {
        for(int i = 0; i < 13; i++)
        {
            deck[i] = new Card("h", (i + 1));
            // 13 cards with suit "h" and values 1 to 13 incl.
        }
    }
}
for(int i = 13; i < 26; i++)
{
    deck[i] = new Card("d", (i%13 + 1));
    // 13 cards with suit "d" and values 1 to 13 incl.
}
for(int i = 26; i < 39; i++)
{
    deck[i] = new Card("c", i%13 + 1);
    // 13 cards with suit "c" and values 1 to 13 incl.
}
for(int i = 39; i < 52; i++)
{
    deck[i] = new Card("s", i%13 + 1);
    // 13 cards with suit "s" and values 1 to 13 incl.
}
for(int i = 0; i < 52; i++)
{
    // if a Jack, Queen or King
    if ((deck[i].value >= 11) && (deck[i].value <=13))
        deck[i].value = 10;
    // value now = 10
    else if (deck[i].value == 1) // if an Ace
        deck[i].value = 11; // value now = 11
}

public void shuffle()
// shuffles by selecting 2 cards at random and swapping them
// then repeating 1,000 times
{      // temp card used for swap
    int first = 0, next = 0;
    Random r = new Random();
    for (int count = 0; count < 1000; count++)
    {
        first = r.nextInt()%52;
        // a random number from -51 to +51
        if (first < 0)  // if a negative number
            first += 51; // add 51 to make it positive
        next = r.nextInt()%52;
        if (next < 0)
            next += 51;
        if (first != next) // no point swapping same card
        {
            aCard = deck[first];
            deck[first] = deck[next];
            deck[next] = aCard;
        }//end if
    }//end for
}

public Card dealCard()
{  
    Card nextCard = deck[cardPos];
    cardPos++;
    if (cardPos == 52)
// reached the end of the deck so shuffle and re-set position
//indicator
{
    shuffle();
    cardPos = 0;
}
return nextCard;
}

}// end Class

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Programmer:  Tony Dobele
Filename:  BlackjackApplet.java
Purpose:  This program creates an applet and plays the game
of casino blackjack.
The computer takes the part of the dealer. There is
one player. The program calls two external classes,
Deck and Card.
*/

import java.awt.*;
import java.applet.*;

public class BlackjackApplet extends Applet
{
    Deck deck = new Deck();
    Card[] playerHand = new Card[11];
    Card[] dealerHand = new Card[6];
    int pHandSize;
    int dHandSize;
    int pTotal;
    int dTotal;

    //used in paint() to find and position images
    int top;
    int left;
    Image card;

    String message;
    Font bigFont;  // Font that will be used to display the message.

    public void init()
    {
        Canvas cardCanvas = new Canvas();
        setLayout(new BorderLayout());

        //add components to applet
        add(cardCanvas, BorderLayout.NORTH);

        bigFont = new Font("Serif", Font.BOLD, 14);

        setUpGame();
    }

    public void setUpGame()
{ pHandSize = dHandSize = 0;
dock.shuffle();

playerHand[pHandSize] = deck.dealCard();// player's first card
pHandSize++;
dealerHand[dHandSize] = deck.dealCard();// dealer's first card
dHandSize++;

playerHand[pHandSize] = deck.dealCard();// player's second card
pHandSize++;

pTotal = playerHand[0].value + playerHand[1].value;
dTotal = dealerHand[0].value;
message = "Dealer has " + dTotal + ", you have " + pTotal;

repaint();
}

public void paint (Graphics g)
{
    left = 10;
top = 30;
g.setFont(bigFont);
g.drawString("Dealer's Card:", 10, 20);
g.drawString("Your Cards:", 10, 150);
g.drawString(message, 10, getSize().height - 35);

    for (int i = 0; i < dHandSize; i++)
    {
        card = getImage(getDocumentBase(), dealerHand[i].image);
        g.drawImage(card, left, top, this);
        left = left + 80;
    }

    left = 10;
top = 160;
    for (int i = 0; i < pHandSize; i++)
    {
        card = getImage(getDocumentBase(), playerHand[i].image);
        g.drawImage(card, left, top, this);
        left = left + 80;
    }
}

}// end paint()

}// end Blackjack