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"""
MATH20621 - Coursework 2
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Do not change any part of this string except to replace
the <tags> with your name, id and university email address.
"""


from random import random

# Problem 1
def new_deck():
    # TODO: replace 'pass' with your code for problem 1
    ranks=['A','2','3','4','5','6','7','8','9','10','J','Q','K']
    suits=['♥','♣','♦','♠']
    deck=[]
    for rank in ranks:
        card=rank+suits[0]
        deck.append(card)
    for rank in ranks:
        card=rank+suits[1]
        deck.append(card)
    for rank in reversed(ranks):
        card=rank+suits[2]
        deck.append(card)
    for rank in reversed(ranks):
        card=rank+suits[3]
        deck.append(card)
    return deck
# Problem 2
def riffle(d):
    # TODO: replace 'pass' with your code for problem 2
    half = len(d) // 2
    list_A = d[:half]
    list_B = d[half:]
    shuffled_deck = []

    while list_A or list_B:
        if list_A and list_B:
            prob_A = len(list_A) / (len(list_A) + len(list_B))
            if random() < prob_A:
                shuffled_deck.append(list_A.pop(0))
            else:
                shuffled_deck.append(list_B.pop(0))
        elif list_A:
            shuffled_deck.append(list_A.pop(0))
        else:
            shuffled_deck.append(list_B.pop(0))

    return shuffled_deck
# Problem 3
def deal(d, n):
    # TODO: replace 'pass' with your code for problem 3
    hands = [[] for _ in range(n)]
    while len(d) >= n:
        for i in range(n):
            hands[i].append(d.pop(0))
    return hands
# Problem 4
def hand_string(h):
    # TODO: replace 'pass' with your code for problem 4
    def card_to_number(card):
        suits = ['♥', '♣', '♦', '♠']
        ranks = ['A', '2', '3', '4', '5', '6', '7', '8', '9', '10', 'J', 'Q', 'K']
        rank, suit = card[:-1], card[-1]
        return suits.index(suit) * 13 + ranks.index(rank)
    return " ".join(sorted(h, key=card_to_number))
# main() function for all the testing
def main():
    # TODO: add any tests of your own here.
    #       These tests will not be assessed.
    print(new_deck())
    a = ['3♣','A♥','2♥','3♥','4♥','7♠']
    print(riffle(a))
    d= ['A♥','2♥','4♥','5♥','3♥','6♥','7♥','8♥']
    n = 3
    print(deal(d, n))
    h= ['J♠','2♥','5♥','8♥','J♥','8♦','5♣','K♣','3♦','5♦','6♦','7♠','9♠','K♠','A♣']
    print( hand_string(h))
main() # call main() function to run all tests
```