1. Answer each of the following. Assume that unsigned integers are stored in 2 bytes and that the starting address of the array is at location 1002500 in memory.
a) Define an array of type unsigned int called values with five elements, and initialize the elements to the even integers from 2 to 10. Assume the symbolic constant SIZE has been defined as 5.
unsigned int values[SIZE] = {2,4,6,8,10};

b) Define a pointer vPtr that points to an object of type unsigned int.
unsigned int vPtr;

c) Print the elements of array values using array subscript notation. Use a for statement and assume integer control variable i has been defined.
for (i = 0; i < SIZE; i++){printf("%d", values[i]);}

d) Give two separate statements that assign the starting address of array values to pointer variable vPtr.
vPtr = values;
vPtr = &values[0];

e) Print the elements of array values using pointer/offset notation.
for(int i = 0; i < SIZE; i++){printf("%d", *(vPtr + i));}

f) Print the elements of array values using pointer/offset notation with the array name as the pointer.
for(int i = 0; i < SIZE; i++){printf("%d", *(values + i));}

g) Print the elements of array values by subscripting the pointer to the array.
for (i = 0; i < SIZE; i++){printf("%d", vPtr[i]);}

h) Refer to element 5 of array values using array subscript notation, pointer/offset notation with the array name as the pointer, pointer subscript notation, and pointer/offset notation.
values[5], *(values + 5), vPtr[5], *(vPtr + 5)

i) What address is referenced by vPtr + 3? What value is stored at that location?
1002506, 8.

j) Assuming vPtr points to values[4], what address is referenced by vPtr -= 4? What value is stored at that location?
1002500, 2.

2. For each of the following, write a single statement that performs the indicated task. Assume that long integer variables value1 and value2 have been defined and that value1 has been initialized to 200000.
a) Define the variable lPtr to be a pointer to an object of type long.
long *lPtr;

b) Assign the address of variable value1 to pointer variable lPtr.
lPtr = &values1;

c) Print the value of the object pointed to by lPtr.
printf("%ld", *lptr);

d) Assign the value of the object pointed to by lPtr to variable value2.
value2 = *lPtr;

e) Print the value of value2.
printf("%ld", value2);

f) Print the address of value1.
printf("%p", &values1);

g) Print the address stored in lPtr. Is the value printed the same as the address of value1?
printf("%p", lPtr); Yes it is same as address of value1.

3. Do each of the following:
a) Write the function header for function zero, which takes a long integer array parameter bigIntegers and does not return a value.
void zero(long int *bigIntegers)
b) Write the function prototype for the function in part (a).
 void zero(long int *bigIntegers);

c) Write the function header for function add1AndSum, which takes an integer array pa- rameter oneTooSmall and returns an integer.
int add1AndSum(int *oneTooSmall)
d) Write the function prototype for the function described in part (c).
int add1AndSum(int *oneTooSmall);

4. *(Card Shuffling and Dealing)* Modify the program in Fig. 7.24 (provided on Canvas) so that the card-dealing function deals a five-card poker hand. Then write the following additional functions: a) Determine whether the hand contains a pair.
b) Determine whether the hand contains two pairs.
c) Determine whether the hand contains three of a kind (e.g., three jacks).
d) Determine whether the hand contains four of a kind (e.g., four aces).
e) Determine whether the hand contains a flush (i.e., all five cards of the same suit).
f) Determine whether the hand contains a straight (i.e., five cards of consecutive face values).

5. *(Polling)* The Internet and the web are enabling more people to network, join a cause, voice opinions, and so on. The U.S. presidential candidates in 2008 used the Internet intensively to get out their messages and raise money for their campaigns. In this exercise, you'll write a simple polling program that allows users to rate five social-consciousness issues from 1 (least important) to 10 (most important). Pick five causes that are important to you (e.g., political

issues, global environ- mental issues). Use a one-dimensional array topics (of type char *) to store the five causes. To summarize the survey responses, use a 5-row, 10-column two-dimensional array responses (of type int), each row corresponding to an element in the topics array. When the program runs, it should ask the user to rate each issue. Have your friends and family respond to the survey. Then have the program display a summary of the results, including:

a) A tabular report with the five topics down the left side and the 10 ratings across the top, listing in each column the number of ratings received for each topic.

b) To the right of each row, show the average of the ratings for that issue.

c) Which issue received the highest point total? Display both the issue and the point total.

d) Which issue received the lowest point total? Display both the issue and the point total.