DSA MIDS REVIEWER

Total points 26/40

Hope this helps!! ^-^

22 of 30 points

✗ Which of the following is true about the running time of SET operations where elements are distinct? *0/2

Note: N is the number of elements.

- [ ] In linked list, inserting an element is O(1) and deleting a given element is O(N).
- [x] In bit-vector implementation, inserting an element is O(1) and deleting and element is O(N). ✗
- [ ] In the array implementation, inserting an element is O(1) and deleting an element is O(N).

Correct answer

- [x] In linked list, inserting an element is O(1) and deleting a given element is O(N).
- [x] In the array implementation, inserting an element is O(1) and deleting an element is O(N).

✓ Given the computer word definition of a set: **typedef short SET;** * 2/2

Function **findSet()** - The function will return the set containing elements found in the 1st given set but not found in the 2nd given set.

```
SET findSet(SET B, SET A)
{
   return _________
}
```

Fill in the blank.
Do not put unnecessary spaces.

B&~A; ✓

✓ Given the computer word definition of a set: **typedef short SET;** * 2/2

Function **findSet()** - Returns the set containing elements common to 2 given sets A and B.

```
SET findSet(SET A, SET B)
{
   return _________
}
```

Fill in the blank.
Do not put unnecessary spaces.

A&B; ✓

✗ Given the bit-vector definition of a set: **typedef char SET[8];** * 0/2

Function **isElem()** - The function will return 1, if the given element is a member of the given set; otherwise return 0.

```
int isElem(SET B, int elem)
{
   return _____ ? 0 : 1;
}
```

Fill in the blank.
Do not put unnecessary spaces.

B&(1 << elem)==1 ✗

Correct answers

B[elem]==0

B[elem]!=1

✓ Given the computer word definition of a set: **typedef short SET;** * 2/2

Function **findSet()** - The function will return the union of two sets A and B.

```
SET findSet(SET A, SET B)
{
   return _________
}
```

Fill in the blank.
Do not put unnecessary spaces.

A|B; ✓

✓ Given the computer word definition of a set: **typedef char SET;** * 2/2

Declaration: **SET A = 70;**

What is the smallest element of set A?

1 ✓

✓ Given the computer word definition of a set: **typedef char SET;** * 2/2

Declaration: **SET A = -59;**

What is the biggest element of the Universal set where A is a subset?

7 ✓

✓ Given the computer word definition of a set: **typedef short SET;** * 2/2

What is the biggest possible element in the set?

15 ✓

✓ Given the computer word definition of a set: **typedef char SET;** * 2/2

Declaration: **SET A = -59;**

Which of the following is not an element of set A?

- ○ 2
- ○ 0
- ○ 6
- ◉ 5 ✓

✓ Given the computer word definition of a set: **typedef char SET;** * 2/2

Declaration: **SET A = 70, B = -59;**

Give an element that is found in both sets A and B.

2 ✓

✓ If the number of expected elements to be stored in a closed hash table is 200 and packing density or load factor is 80%, what is the size of the hash table? *2/2

250 ✓

✗ Which of the following is true? * 0/2

- [x] If M elements are evenly distributed by the hash function in an open hash table with N array size, then the running time of operation member is O(N/M). ✗
- [ ] In closed hashing, as packing density increases, the number of collision increases.
- [ ] A perfect hash function for a given set of N elements is a function that maps each element to a distinct integer within the range and produces a few collision.

Correct answer

- [x] In closed hashing, as packing density increases, the number of collision increases.

✓ **When the integers 16, 43, 73, 85, and 24 are processed in this order, in which entry is the last value 24 stored?** *2/2

Let A be an array of integers of size 10, whose *i^th* entry is represented by A[i] for i = 0 to 9, and its initial value is 0. For a positive integer k, the rules below determine the entry in which the value k is stored. Here, x mod y represents the remainder after the division of x by y.

[Rules]

1. If A[k mod 10] = 0, then store k in A[k mod 10].
2. Otherwise, if A[(k + 1) mod 10] = 0, then store k in A[(k + 1) mod 10].
3. Otherwise, if A[(k + 4) mod 10] = 0, then store k in A[(k + 4) mod 10].
4. Otherwise, discard k.

- ○ 24 is discarded
- ○ A[4]
- ○ A[6]
- ◉ A[8] ✓
- ○ A[5]

✓ A 5-digit decimal number “a1a2a3a4a5” is stored in the array representing the closed hash table. If the hash function returns the result of operation: (a1+a2+a3+a4+a5) % 13, what is the hash value of number 55555? *2/2

12 ✓

✗ If the dictionary is implemented using open hashing with N elements and the hash function returns a hash value V where 0 <= V <= M -1, what is the running time of function **isMember()**? *0/2

- O(M)
- O(1)
- O(N/M)
- O(N/V)
- (●) O(N) ✗

Correct answer

- (●) O(N/M)

DSA MIDS REVIEWER - PART 2 4 of 10 points

This part is a bit scuffed, so just do your best!! ^-^

Given the data type definition

#define SIZE OXA
typedef short BitVector[SIZE];

Function Specification:
The function **findDifference()** will return to the calling function the pointer to the set that contains elements in the 1st given set that are not found in the 2nd given set.

Function Definition:

```
Blank_01 findDifference(BitVector A, BitVector B)
{
   int x;
   Blank_02        // declare C, allocate space, and initialize each array component to zeros
   if (C != NULL) {
      for (x = 0; x < SIZE; x++) {
         Blank_03 = (Blank_04 || Blank_05) ? 1 : 0;
      }
   }
   return C;
}
```

Fill in the blanks.

✓ **Blank_01** * 2/2

Do not put spaces when it is not necessary

BitVector* ✓

✗ **Blank_02** * 0/2

Do not put spaces when it is not necessary

BitVector*C=(BitVector*)calloc(1,sizeof(BitVector)*SIZE) ✗

Correct answers

BitVector*C=(BitVector*)calloc(10,sizeof(short));

BitVector *C = (BitVector *)calloc(10, sizeof(short));

✓ **Blank_03** * 2/2

Do not put spaces when it is not necessary

(*C)[x] ✓

✗ **Blank_04** 0/2

Do not put spaces when it is not necessary
(DISCLAIMER) The answers here are what I think, but I'm not sure that they're correct, so it's skippable.

A[x] ✗

Correct answers

A[x]==0

A[x]!=1

✗ **Blank_05** 0/2

Do not put spaces when it is not necessary
(DISCLAIMER) The answers here are what I think, but I'm not sure that they're correct, so it's skippable.

B[x] ✗

Correct answers

B[x]==1

B[x]!=0