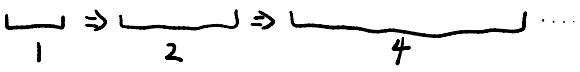
Test 1 Data Structure

Saturday, November 20, 2021 1:58 PM

Q1. StudentMark [list]

for each object has 2 words (StudentID and Mark)
4 bytes



initially its capacity = 16

to contain 100 16 → 32 → 64 → 128

words number: 128×2 = 256 words

Q2.

```
public void append(val, list)
{
    if (size == maxsize)
    {
        int[] newArr = new int[maxsize * 2];
        for (i = 0; i <= maxsize ; i++) ☆
            newArr[i] = arr[i]
        arr = newArr;
        maxsize = maxsize *2
    }
    arr[size++] = val
}
```

Q3. StudentList (list) 100 objects

each object contains 2 words (Student Id , Mark)
4 bytes

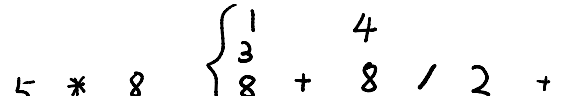
use DLCL (double linked circular list)

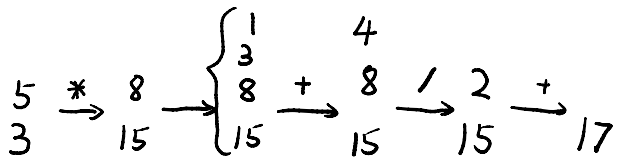
each pointer (1 word)

| 先 | 现 | 内容 | 后 |

5×100 = 500 words

Q4. 35*831+/+

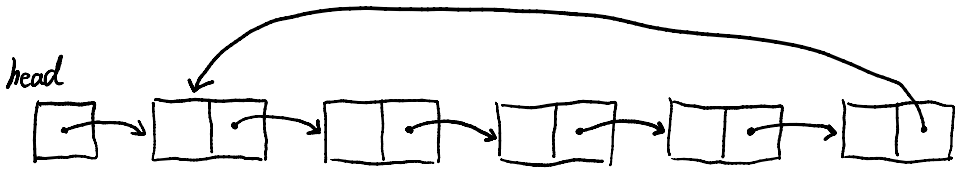




max = 4

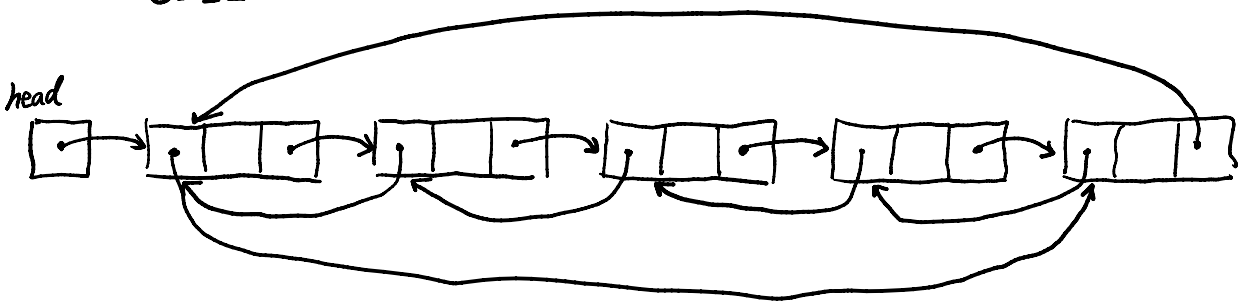
Q5. CSLL (Circular Singly Linked List) 5 elements
CDLL (Circular Doubly Linked List) 5 elements

CSLL



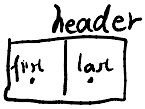
5 + 1 = 6 head + each pointers

CDLL



2 + 1 = 3 head + first + last

Q6. Singly linked list

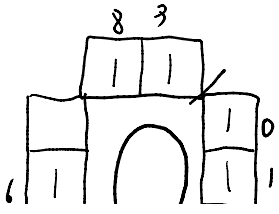


Dequeuing means removing a node from the linked list

Enqueuing means appending a node to the linked list

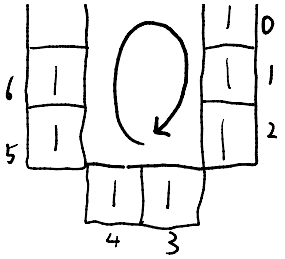
So they will have the same constant cost

Q7.



8E 6D 5E 2D 4E 7D 8E 3D 2E

queue first in first out

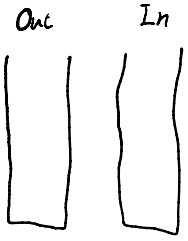


queue first in first out

so 0-6 and 8-3

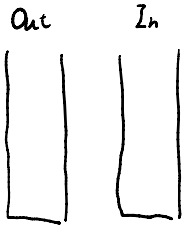
Q8.

Enqueue



① pop all in Out
② push all to In
until Out empty
push one to In

Dequeue



① pop all in In
② push all to Out
until In empty
pop one to Out

E E E D D E E D

push push push pop pop pop push pop

push push push

pop pop pop

push push

pop pop

push push

pop pop

1 + 1 + 1 + 7 + 1 + 3 + 1 + 7 = 22