

מבוא למדעי המחשב
202-1-101-1

סמסטר ב', תשס"ז, 2006/7
בחינת מועד ב'

דף תשובות

שאלה 1 סעיף א' (10 נקודות)

```
private static int split(int[] arr, int left, int right) {
    double avg = avg(arr, left, right);
    while (left < right) {
        while (left < right && arr[left] < avg)
            ++left;
        while (right > left && arr[right] >= avg)
            --right;
        swap(arr, left, right);
    }
    return right;
}
```

שאלה 1 סעיף ב' (15 נקודות)

```
private static void split(int[] arr) {
    int left = 0;
    int right = arr.length-1;
    int mid = arr.length / 2;
    int cut = split(arr, left, right);
    while (cut != mid) {
        if (cut < mid)
            left = cut;
        else
            right = cut - 1;
        cut = split(arr, left, right);
    }
}
```

שאלה 1 סעיף ג' (10 נקודות)

```
private static int median(int[] arr) {
    split(arr);
    int mid = arr.length / 2;
    int min = arr[mid];
    for (int i = mid + 1; i < arr.length; ++i)
        if (arr[i] < min)
            min = arr[i];
    return min;
}
```

שאלה 2 (15 נקודות)

```
private static void change(int n, int[] value, int[] count, int min) {
    if (n == 0) {
        for (int i = 0; i < count.length; ++i)
            for (int j = 0; j < count[i]; ++j)
                System.out.print(value[i] + ", ");
        System.out.println();
    }
    else
        for (int i = min; i < value.length; ++i)
            if (n >= value[i]) {
                ++count[i];
                change(n - value[i], value, count, i);
                --count[i];
            }
}
```

או ללא לולאה

```
private static void change(int n, int[] value, int[] count, int min) {
    if (n == 0) {
        for (int i = 0; i < count.length; ++i)
            for (int j = 0; j < count[i]; ++j)
                System.out.print(value[i] + ", ");
        System.out.println();
    }
    else if (min < value.length) {
        if (n >= value[min]) {
            ++count[min];
            change(n - value[min], value, count, min);
            --count[min];
        }
        change(n, value, count, min + 1);
    }
}
```

שאלה 3 סעיף א' (10 נקודות)

```
public LinkedList concat (LinkedList list) {
    if (list.isEmpty())
        return this;
    return new LinkedList(list.head(), concat(list.tail()));
}
```

שאלה 3 סעיף ב' (10 נקודות)

```
public LinkedList insAfter (Object x, LinkedList list) {
    if (isEmpty())
        return null;
    if (head().equals(x))
        return new LinkedList(head(), tail().concat(list));
    LinkedList t = tail().insAfter(x, list);
    if (t == null)
        return null;
    return new LinkedList(head(), t);
}
```

שאלה 4 סעיף א' (20 נקודות)

```
public class CharactersBuffer implements Buffer {  
  
    private Queue que;  
    private Stack stk1;  
    private Stack stk2;  
  
    public CharactersBuffer(Queue que, Stack stk1, Stack stk2) {  
        this.que = que;  
        this.stk1 = stk1;  
        this.stk2 = stk2;  
    }  
  
    public void put(Object x) {  
        que.enqueue(x);  
    }  
  
    public Object get() {  
        Object ans = null;  
        if (!stk1.isEmpty())  
            ans = stk1.pop();  
        else if (!que.isEmpty())  
            ans = que.dequeue();  
        if (ans != null)  
            stk2.push(ans);  
        return ans;  
    }  
  
    public void back() {  
        if (!stk2.isEmpty())  
            stk1.push(stk2.pop());  
    }  
}
```

שאלה 4 סעיף ב' (10 נקודות)

```
public class CharacterBufferThatPutStrings extends CharactersBuffer {  
  
    public CharacterBufferThatPutStrings(Queue que, Stack stk1, Stack stk2) {  
        super(que, stk1, stk2);  
    }  
  
    public void put(Object x) {  
        String s = (String) x;  
        for (int i = 0; i < s.length(); ++i)  
            super.put(new Character(s.charAt(i)));  
    }  
}
```