מבוא למדעי המחשב
202-1-101-1

מבוא לתכנות למערכות מידע
202-1-104-1

סמסטר א', תשס"ז, 2006/7

בחינת מועד ב' – 16.2.2007

דף תשובות

שאלה 1 (20 נקודות)

סעיף א' (5 נקודות)

public boolean isEmpty(){

```
  return m_sPQ.isEmpty();
}
```

סעיף ב' (15 נקודות)

public void insert(Comparable cData){

```
  Stack   temp = new AStack();
  boolean stop = false;

  while (!stop & !m_sPQ.isEmpty()) {
      Object top = m_sPQ.pop();

      if (cData.compareTo(top) < 0)
          temp.push(top);
      else {
          m_sPQ.push(top);
          stop = true;
      }
  }

  m_sPQ.push(cData);

  while (!temp.isEmpty())
      m_sPQ.push(temp.pop());
```

}

שאלה 2 (30 נקודות)

סעיף א'(10 נקודות)

```
private void computeLevelList(LinkedList llLevel, int iDepth, BinaryNode bnNode){
        if (bnNode != null) {
            if (iDepth > 0) {
                computeLevelList(llLevel, iDepth-1,
bnNode.getRightChild());
                computeLevelList(llLevel, iDepth-1,
bnNode.getLeftChild());
            }
            else
                llLevel.addHead(bnNode.getData());
        }
```

```
}
```

סעיף ב'(10 נקודות)

```
public class LevelIterator implements Iterator{
    private BinaryTree tree;
    private int        depth;
    private LinkedList levelList;
```

```
      public  LevelIterator(BinaryTree tree){
              this.tree = tree;

             depth     = 0;
              levelList = tree.computeLevelList(depth);
```

```
      }

      public boolean hasNext(){
              return !levelList.isEmpty();
```

```
      }
```

```
        public Object next(){
                LinkedList ans = levelList;

                depth     = depth + 1;
                levelList = tree.computeLevelList(depth);

                return ans;

              _____________________________________________________________

              _____________________________________________________________
        }

}
```

<u>סעיף ג'(10 נקודות)</u>

```
public LinkedList[] getLevelsArray(){
        LinkedList[] ans = new LinkedList[height() + 1];
        int index = 0;

        for(LevelIterator iter = new LevelIterator(this);
iter.hasNext();  index = index+1) {
            ans[index] = (LinkedList) iter.next();
        }

        return ans;

      _____________________________________________________________

      _____________________________________________________________

      _____________________________________________________________

      _____________________________________________________________
}
```

שאלה 3 (25 נקודות)

סעיף א' (5 נקודות)

```
public static void subsetsSum(int[] aSet, int iK)

        subsetSum(aSet, iK, 0, "");

}
```

סעיף ב' (20 נקודות)

```
public static void subsetsSum (int[] aSet, int iK, int index, String acc){
        if (iK == 0)
            System.out.println(acc);
        else if (iK > 0  &  index < aSet.length) {
            subsetsSum(aSet, iK - aSet[index], index + 1, acc +
aSet[index] + ',');
            subsetsSum(aSet, iK, index + 1, acc);
        }
```

_____

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```
}
```

שאלה 4 (25 נקודות)

סעיף א'(5 נקודות)

```
public void addHead(Object oData){
        DLink elem = new DLink(m_lHead, null, oData);

        if (m_lHead != null)
            m_lHead.setPrevious(elem);
        else
            m_lTail = elem;

        m_lHead = elem;
```

```
}
```

סעיף ב'(5 נקודות)

```
public Object removeHead(){
        Object headData = null;

        if (m_lHead != null) {
            headData = m_lHead.getData();
            m_lHead  = m_lHead.getNext();

            if (m_lHead != null)
                m_lHead.setPrevious(null);
            else
                m_lTail = null;
        }

        return headData;
```

```
}
```

סעיף ג'(5 נקודות)

```
public static boolean isPalindrome (String sExp){
        DoublyLinkedList dllList=new DoublyLinkedList();
        ____________________________________________________
        ____________________________________________________
          for (int i = sExp.length()-1;  i >= 0;  i = i-1)
              dllList.addHead(sExp.substring(i, i+1));
        ____________________________________________________
        ____________________________________________________
        return isPalindrome (dllList);
}
```

סעיף ד'(10 נקודות)

```
public static boolean isPalindrome( DoubleLinkedList dllList){
          boolean ans  = true;
          int     size = dllList.size();

          while (ans  &  size > 1)
              if (! dllList.removeHead().equals(
  dllList.removeTail()))
                  ans = false;
              else
                  size = size - 2;

          return ans;
        ____________________________________________________
        ____________________________________________________
        ____________________________________________________


}// isPalindrome
```

בהצלחה!