

```
public class Student
{
    private String name;
    private int id;
    private double grade;

    public Student () {
        name = "";
        id = 0;
        grade = 0;
    }

    public Student (String n, int i, double g) {
        name = n;
        id = i;
        grade = g;
    }

    public void setName (String n) {
        name = n;
    }

    public String getName () {
        return name;
    }

    public void setId (int i) {
        id = i;
    }

    public int getId () {
        return id;
    }

    public void setGrade (double g) {
        grade = g;
    }

    public double getGrade () {
        return grade;
    }
}
```

```
public class Teacher
{
    private String name;
    private int id;
    private double salary;

    public Teacher() {
        name = "";
        id = 0;
        salary = 0;
    }

    public Teacher(String n, int i, double s) {
        name = n;
        id = i;
        salary = s;
    }

    public void setName(String n) {
        name = n;
    }

    public String getName() {
        return name;
    }

    public void setId(int i) {
        id = i;
    }

    public int getId() {
        return id;
    }

    public void setSalary(double s) {
        salary = s;
    }

    public double getSalary() {
        return salary;
    }
}
```

```
public class Node<T>
{
    private T data;
    private Node<T> next;

    public Node(T d) {
        data = d;
        next = null;
    }

    public void setNext(Node<T> n) {
        next = n;
    }

    public Node<T> getNext() {
        return next;
    }

    public void setData(T d) {
        data = d;
    }

    public T getData() {
        return data;
    }
}
```

```
public abstract class Collection<T>
{
    Node<T> first;

    public Collection() {
        first = null;
    }

    public abstract void insert(T data);
    public abstract T remove();
}
```

```
public class List<T> extends Collection<T>
{
    private String name;

    public List() {
        first = null;
        name = "";
    }

    public List(String n) {
        first = null;
        name = new String(n);
    }

    public void insert(T d) {
        insertAtBack(d);
    }

    public void insertAtFront(T d) {
        Node<T> newNode = new Node<T>(d);
        newNode.setNext(first);
        first = newNode;
    }

    public void insertAtBack(T d) {
        if (first == null) {
            first = new Node<T>(d);
        }
        else {
            Node<T> current = first;

            while(current.getNext() != null)
                current = current.getNext();

            Node <T> newNode = new Node<T>(d);
            current.setNext(newNode);
        }
    }

    public T remove() {
        return removeFromBack();
    }

    public T removeFromFront() {
        T data = null;

        if(first != null) {
            data = first.getData();
            first = first.getNext();
        }

        return data;
    }
}
```

```
public T removeFromBack () {
    T data = null;

    if(first != null) {
        if (first.getNext () == null) {
            first = null;
        }
        else {
            Node<T> current = first;
            Node<T> previous = null;

            while(current.getNext () != null) {
                previous = current;
                current = current.getNext ();
            }

            data = current.getData ();
            previous.setNext (null);
        }
    }

    return data;
}

public int size () {
    int size = 0;

    if(first != null) {
        size = 1;
        Node<T> current = first;

        while(current.getNext () != null) {
            current = current.getNext ();
            size++;
        }

    }

    return size;
}
}
```

```
public class Department
{
    private List<Student> s;
    private List<Teacher> t;
    private String name;

    public Department (String n) {
        name = new String (n);
        s = new List<Student> ("Students");
        t = new List<Teacher> ("Teachers");
    }

    public void addStudent (Student x) {
        s.insertAtBack (x);
    }

    public void addTeacher (Teacher x) {
        t.insertAtBack (x);
    }

    public void addST (Student x, Teacher y) {
        addStudent (x);
        addTeacher (y);
    }

    public int getNoOfStudent () {
        return s.size ();
    }

    public int getNoOfTeacher () {
        return t.size ();
    }
}
```

```
public class TestDepartment
{
    public static void main(String [] args) {
        Department d = new Department("CSC");

        Student s1 = new Student("Ahmad",10,3.5);
        Student s2 = new Student("Khaled",20,2.5);
        Student s3 = new Student("Mohammed",30,4.5);

        Teacher t1 = new Teacher("Abdulrahman",100,11000);
        Teacher t2 = new Teacher("Salman",200,2500);
        Teacher t3 = new Teacher("Saad",300,8000);

        d.addStudent(s1);
        d.addStudent(s2);
        d.addStudent(s3);

        d.addTeacher(t1);
        d.addTeacher(t2);
        d.addTeacher(t3);

        System.out.println("Number of Students: " + d.getNoOfStudent());
        System.out.println("Number of Teachers: " + d.getNoOfTeacher());
    }
}
```