

```

public class Graduate extends Student{

    private int nbPapers;

    public Graduate(String name, double gpa, int nbPapers)
    {
        super(name,gpa);
        this.nbPapers = nbPapers;
    }

    public Graduate(Graduate g) {
        super(g);
        nbPapers = g.nbPapers;
    }

    public double calculateScore() {
        return nbPapers * gpa;
    }

    public int getNbPapers() {

        return nbPapers;
    }
}

public class Institute {
    private String name;
    private Person arp[];
    private int nb;

    Institute(String name)
    {
        this.name = name;
        arp = new Person[2000];
        nb = 0;
    }

    public void addPrson(Person p)
    {
        if(nb >= arp.length)
            return;

        if(p instanceof Graduate)
            arp[nb] = new Graduate((Graduate)p);
        else
            arp[nb] = new Undergraduate((Undergraduate)p);
        nb++;
    }
}

```

```

public int countUnder(double s)
{
    int count = 0;
    for(int i = 0; i<nb ; i++)
        if(arp[i] instanceof Undergraduate)
            if(arp[i].calculateScore() >= s)
                count++;
    return count;
}

public Graduate[] getGraduate(int n)
{
    Graduate[] g = new Graduate[nb];
    int j = 0;
    for(int i=0; i<nb ; i++)
    {
        if(arp[i] instanceof Graduate)
        {
            Graduate x = (Graduate)arp[i];
            if(x.getNbPapers() > n)
            {
                g[j] = x;
                j++;
            }
        }
    }
    return g;
}
}

```

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Not required classes:

```

public interface Person {

    double calculateScore();
    String getName();

}

public abstract class Student implements Person
{
    private String name;
    protected double gpa;

    public Student(String name, double gpa) {
        this.name = name;
        this.gpa = gpa;
    }

    public Student(Student s) {
        name = s.name;
        gpa = s.gpa;
    }
}

```

```
        public String getName() {
            return name;
        }
    }

    public class Undergraduate extends Student{

        public Undergraduate(String name, double gpa)
        {
            super(name,gpa);
        }
        public Undergraduate(Undergraduate p) {
            super(p);
        }

        public double calculateScore() {
            return gpa*3+5;
        }
    }
}
```