



## AP<sup>®</sup> Computer Science A 2003 Sample Student Responses

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The following chart shows an example of colleges that could appear in an object of type `CollegeGroup`.

	Name	Region	Tuition
0	Colgate University	Northeast	\$27,025
1	Duke University	Southeast	\$26,000
2	Kalamazoo College	Midwest	\$19,764
3	Stanford University	West	\$25,917
4	Florida International University	Southeast	\$10,800
5	Dartmouth College	Northeast	\$27,764
6	Spelman College	Southeast	\$11,455

- (a) Write the `College` member function `UpdateTuition`, which is described as follows. `UpdateTuition` changes the tuition of the college whose name is passed as a parameter.

For example, if the object `colleges` is of type `CollegeGroup` and contains the entries shown in the chart above, the call `colleges.UpdateTuition("Colgate University", 27500)` would change the tuition of Colgate University to \$27,500.

Complete function `UpdateTuition` below.

```
void CollegeGroup::UpdateTuition(const apstring & collegeName,
                                int newTuition)
// precondition: collegeName exists in this CollegeGroup
// postcondition: the tuition for collegeName is changed to newTuition
```

```
{
```

```
    int x ;
```

```
    for (x=0 ; x < myColleges.length() ; x++)
```

```
    {
```

```
        if (collegeName == myColleges[x].Name())
            myColleges[x].SetTuition(newTuition);
```

```
    }
```

```
}
```

Part (b) begins on page 6.

GO ON TO THE NEXT PAGE.

Complete function GetCollegeList below.

```
apvector<College> CollegeGroup::GetCollegeList(const apstring & region,
                                              int low, int high) const
// precondition: low <= high
// postcondition: returns array of colleges in region
//                where low <= tuition <= high;
//                the size of the array returned is equal to the number
//                of colleges that meet the criteria
```

```
{
    int x;
    apvector<College> list(0);
    int size = 0;
    for(x = 0; x < myColleges.length(); x++)
    {
        if ((myColleges[x].Region == region) && (myColleges[x].Tuition >= low) &&
            (myColleges[x].Tuition <= high))
        {
            size++;
            list.resize(size);
            list[size-1] = myColleges[x];
        }
    }
    return list;
}
```

**GO ON TO THE NEXT PAGE.**

The following chart shows an example of colleges that could appear in an object of type `CollegeGroup`.

	Name	Region	Tuition
0	Colgate University	Northeast	\$27,025
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- (a) Write the `College` member function `UpdateTuition`, which is described as follows. `UpdateTuition` changes the tuition of the college whose name is passed as a parameter.

For example, if the object `colleges` is of type `CollegeGroup` and contains the entries shown in the chart above, the call `colleges.UpdateTuition("Colgate University", 27500)` would change the tuition of Colgate University to \$27,500.

Complete function `UpdateTuition` below.

```
void CollegeGroup::UpdateTuition(const apstring & collegeName,
                                int newTuition)
// precondition: collegeName exists in this CollegeGroup
// postcondition: the tuition for collegeName is changed to newTuition
```

```
int k;
for(k = 0; k < myColleges.length(); k++)
{
    if(myColleges[k].Name() == collegeName)
        myColleges[k].SetTuition(newTuition);
}
```

Part (b) begins on page 6.

**GO ON TO THE NEXT PAGE.**

Complete function GetCollegeList below.

```
apvector<College> CollegeGroup::GetCollegeList(const apstring & region,
                                               int low, int high) const
// precondition: low <= high
// postcondition: returns array of colleges in region
//                where low <= tuition <= high;
//                the size of the array returned is equal to the number
//                of colleges that meet the criteria
```

```
apvector<College> Temp ( myColleges, length ( ) );
```

```
int count = 0;
```

```
int k;
```

```
for (k=0; k < myColleges.length ( )
```

```
{
    if ( myColleges [k]. Region ( ) == region )
    {
        if ( myColleges [k]. Tuition ( ) >= low )
        {
            if ( myColleges [k]. Tuition ( ) <= high )
            {
                Temp [count] = myColleges [k];
                count ++;
            }
        }
    }
}
```

```
Temp.resize (count);
```

```
return Temp;
```

**GO ON TO THE NEXT PAGE.**

The following chart shows an example of colleges that could appear in an object of type `CollegeGroup`.

	Name	Region	Tuition
0	Colgate University	Northeast	\$27,025
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- (a) Write the `College` member function `UpdateTuition`, which is described as follows.  
`UpdateTuition` changes the tuition of the college whose name is passed as a parameter.

For example, if the object `colleges` is of type `CollegeGroup` and contains the entries shown in the chart above, the call `colleges.UpdateTuition("Colgate University", 27500)` would change the tuition of Colgate University to \$27,500.

Complete function `UpdateTuition` below.

```
void CollegeGroup::UpdateTuition(const apstring & collegeName,
                                int newTuition)
// precondition: collegeName exists in this CollegeGroup
// postcondition: the tuition for collegeName is changed to newTuition
{
    for (int index = 0 ; index < myColleges.length() ; index++)
    {
        if (myColleges[index].Name() == collegeName)
        {
            myColleges[index].setTuition(newTuition);
        }
    }
    return;
}
```

Part (b) begins on page 6.

**GO ON TO THE NEXT PAGE.**

Complete function GetCollegeList below.

```
apvector<College> CollegeGroup::GetCollegeList(const apstring & region,
                                               int low, int high) const
// precondition: low <= high
// postcondition: returns array of colleges in region
//                where low <= tuition <= high;
//                the size of the array returned is equal to the number
//                of colleges that meet the criteria
```

↳

```
apvector<college> List;
for (int index = 0; index < myColleges.length(); index++)
{
    if ((myColleges[index].Region() == region) && (myColleges[index].Tuition() <=
low) && (myColleges[index].Tuition() >= high))
    {
        List = List + myColleges[index].Name();
    }
}
return List;
```

↳

**GO ON TO THE NEXT PAGE.**