AP® 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`:

<table>
<thead>
<tr>
<th>Name</th>
<th>Region</th>
<th>Tuition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colgate University</td>
<td>Northeast</td>
<td>$27,025</td>
</tr>
<tr>
<td>Duke University</td>
<td>Southeast</td>
<td>$26,000</td>
</tr>
<tr>
<td>Kalamazoo College</td>
<td>Midwest</td>
<td>$19,764</td>
</tr>
<tr>
<td>Stanford University</td>
<td>West</td>
<td>$25,917</td>
</tr>
<tr>
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</table>

(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.

```cpp
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.
Complete function GetCollegeList below.

void vector<College> CollegeGroup::GetCollegeList(const astring & 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 j;
void vector<college> list(0);
int size = 0;

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

return (list);
The following chart shows an example of colleges that could appear in an object of type `CollegeGroup`.

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                                  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.
Complete function `GetCollegeList` below.

```cpp
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;
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// 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;
```
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// precondition: collegeName exists in this CollegeGroup
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```

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

```cpp
return;
```

Part (b) begins on page 6.
Complete function `GetCollegeList` below.

```cpp
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
```

```cpp
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.Name();

return List;
```

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