



AP[®] Computer Science AB 2002 Sample Student Responses

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Complete function FindBlock below.

```
int Flight::FindBlock(int row, int seatsNeeded) const
// postcondition: returns column index of the first (lowest index)
//                seat in a block of seatsNeeded adjacent
//                empty seats in the specified row;
//                if no such block exists, returns -1
{
    int col, colLen = mySeats.numCols(), counter = 0;
    for (col = 0; col < colLen; col++)
    {
        if (mySeats[row][col].GetPassenger().GetName() == "")
            counter++;
        else
            counter = 0;
        if (counter == seatsNeeded)
            return col - seatsNeeded + 1;
    }
    return -1;
}
```

GO ON TO THE NEXT PAGE.

Complete function AssignGroup below.

```
bool Flight::AssignGroup(const apvector<Passenger> & group)
// postcondition: if possible, assigns the group.length() passengers
//                from group to adjacent empty seats in a single row
//                and returns true;
//                otherwise, makes no changes and returns false
{
    int i, row, rowlen = mySeats.numrows(), groupLen = group.length(), temp;
    for (row = 0; row < rowlen; row++)
    {
        temp = FindBlock(row, groupLen);
        if (temp != -1)
        {
            for (i = 0; i < groupLen; i++)
                mySeats[row][temp + i].SetPassenger(group[i]);
            return true;
        }
    }
    return false;
}
```

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A4/ABI B

Complete function EmptySeatCount below.

```
int Flight::EmptySeatCount(const apstring & seatType) const
// postcondition: returns the number of empty seats
//               whose type is seatType;
//               if seatType is "any", returns the
//               total number of empty seats
{
    int i, j, num=0;
    for(i=0; i<mySeats.numRows()numRows(); i++)
        for(j=0; j<mySeats.numCols(); j++)
            if (mySeats[i][j].GetType == seatType || seatType == "any")
                num++ if (mySeats[i][j].GetPassenger().GetName() == "")
                    num++;
    return num;
}
```

GO ON TO THE NEXT PAGE.

Complete function FindBlock below.

```
int Flight::FindBlock(int row, int seatsNeeded) const
// postcondition: returns column index of the first (lowest index)
//                seat in a block of seatsNeeded adjacent
//                empty seats in the specified row;
//                if no such block exists, returns -1
{
    int i, num num = 0;

    for (i = 0; i < mySeats.numcols(); i++)
        if (mySeats[row][i].GetPassenger().GetName() == " ")
        {
            num++;
            if (num == seatsNeeded)
                return num i - seatsNeeded + 1;
        }
        else
            num = 0;

    return -1;
}
```

GO ON TO THE NEXT PAGE.

Complete function AssignGroup below.

```
bool Flight::AssignGroup(const apvector<Passenger> & group)
// postcondition: if possible, assigns the group.length() passengers
//                from group to adjacent empty seats in a single row
//                and returns true;
//                otherwise, makes no changes and returns false
{
```

```
    int i, pos, x = group.length(), q;
```

```
    for (i = 0; i < mySeats.numrows(); i++)
```

```
    {
        pos = FindBlock(i, x);
```

```
        if (pos != -1)
```

```
            break;
```

```
    }
```

```
    if (pos == -1)
```

```
        return false;
```

```
    else
```

```
    {
        for (q = 0; q < group.length()x; q++)
```

```
            mySeats[i][pos + q].Set Passenger (group[q]);
```

```
        return true;
```

```
    }
```

```
}
```

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A4/ABI C

Complete function EmptySeatCount below.

```
int Flight::EmptySeatCount(const apstring & seatType) const
// postcondition: returns the number of empty seats
//               whose type is seatType;
//               if seatType is "any", returns the
//               total number of empty seats
```

```
{   int empty = 0;
    for (int j = 0; j < mySeats.numrows(); j++)
    {
        for (int k = 0; k < mySeats.numcols(); k++)
        {
            if (mySeats[j][k].GetType() == seatType || seatType == "any")
                if (mySeats[j][k].GetName() == "")
                    empty = empty + 1;
        }
    }
    return empty;
}
```

GO ON TO THE NEXT PAGE.

Complete function FindBlock below.

```
int Flight::FindBlock(int row, int seatsNeeded) const
// postcondition: returns column index of the first (lowest index)
//                seat in a block of seatsNeeded adjacent
//                empty seats in the specified row;
//                if no such block exists, returns -1
```

```
{
```

```
    for (int k=0; k < mySeats.numcols(); k++)
```

```
    {
```

```
        if (mySeats[row][k].GetName() == "")
```

```
        {
```

```
            for (int j=0; j < seatsNeeded; j++)
```

```
            {
```

```
                if (mySeats[row][k+j].GetName() == "")
```

```
                    (j == seatsNeeded)
```

```
                        return k;
```

```
            } else
```

```
                j = seatsNeeded
```

```
        } } }
```

```
    return -1;
```

```
}
```

GO ON TO THE NEXT PAGE.

Complete function AssignGroup below.

```
bool Flight::AssignGroup(const apvector<Passenger> & group)
// postcondition: if possible, assigns the group.length() passengers
//                from group to adjacent empty seats in a single row
//                and returns true;
//                otherwise, makes no changes and returns false
```

```
{
    int seatsNeeded, BlockStart, i)

    seatsNeeded = group.length();
    i = 0;
    for (int k = 0; k < mySeats.numrows(); k++)
    {
        BlockStart = FindBlock(k, seatsNeeded);
        if (BlockStart > 0)
        {
            for (int j = BlockStart; j < seatsNeeded; j++)
            {
                mySeats[k][j].SetPassenger(group[i]);
                i++;
            }
            return true;
        }
    }
    return false;
}
```

GO ON TO THE NEXT PAGE.