

Answer on Question#38480- Programming, C++

Programming Data Structures

1

2. A student is a person, and so is an employee. Create a class person that has the data attribute common to both students and employees (name, social security number, age, gender, address, and telephone number) and appropriate method definitions. A student has a grade-point average (GPA), major, and year of graduation. An employee has a department, job title, and year of hire. In addition, employees (hourly rate, hours worked, and union dues) and salaried employees (annual salary). Define a class hierarchy and write an application class that you can use to first store the data for an array of people and then display that information in a meaningful way.

After testing, submit your solution

#2

Write code for a method

```
Public static Boolean sameElements (int [ ] a, int [ ] b)
```

That checks whether two arrays have the same elements in some order, with the same multiplicities. For example, two arrays

121 144

19 161

19 144

19 11

And

11 121

144 19

161 19

144 19

Would be considered

Solution #1:

```
#include <iostream>
#include <string>

using namespace std;

class Student
{
protected:

    double GPA,major, year;
    int sSocSecurityNum, sAge;
    string sName, sGender, sAddress,
        sTelephoneNum;

public:

    virtual void Init(){}
    virtual void Display(){}

};

class Person : Student
{
public:
    Person(){}

private:

    void Init()
    {
        cout<<endl<<"Enter Name: "; cin>>sName;
        cout<<endl<<"Enter GPA: "; cin>>GPA;
        cout<<endl<<"Enter Major: "; cin>>major;
        cout<<endl<<"Enter Year: "; cin>>year;
        cout<<endl<<"Enter social security number: "; cin>>sSocSecurityNum;
        cout<<endl<<"Enter Age: "; cin>>sAge;
        cout<<endl<<"Enter Gender: "; cin>>sGender;
        cout<<endl<<"Enter Address: "; cin>>sAddress;
        cout<<endl<<"Enter Telephone Number: "; cin>>sTelephoneNum;

    }

    void Display()
    {
        cout<<endl<<"Enter Name: "<<sName;
        cout<<endl<<"Enter GPA: "<<GPA;
        cout<<endl<<"Enter Major: "<<major;
        cout<<endl<<"Enter Year: "<<year;
        cout<<endl<<"Enter social security number: "<<sSocSecurityNum;
        cout<<endl<<"Enter Age: "<<sAge;
        cout<<endl<<"Enter Gender: "<<sGender;
        cout<<endl<<"Enter Address: "<<sAddress;
        cout<<endl<<"Enter Telephone Number: "<<sTelephoneNum;

    }

};

class Employee : Student
{
```

```

public:
    Employee(){}

private:
    string department, jobTitle,
        hourlyRate, hoursWorked, unionDues;

    void Init()
    {
        cout<<endl<<"Enter Name: ";cin>>sName;
        cout<<endl<<"Enter GPA: "; cin>>GPA;
        cout<<endl<<"Enter Major: ";cin>>major;
        cout<<endl<<"Enter Year: ";cin>>year;
        cout<<endl<<"Enter social security number: ";cin>>sSocSecurityNum;
        cout<<endl<<"Enter Age: ";cin>>sAge;
        cout<<endl<<"Enter Gender: ";cin>>sGender;
        cout<<endl<<"Enter Address: ";cin>>sAddress;
        cout<<endl<<"Enter Telephone Number: ";cin>>sTelephoneNum;

        cout<<endl<<"Enter department: ";cin>>department;
        cout<<endl<<"Enter job title: ";cin>>jobTitle;
        cout<<endl<<"Enter hourly rate: ";cin>>hourlyRate;
        cout<<endl<<"Enter union dues: ";cin>>unionDues;
    }

    void Display()
    {
        cout<<endl<<"Enter Name: "<<sName;
        cout<<endl<<"Enter GPA: "<<GPA;
        cout<<endl<<"Enter Major: "<<major;
        cout<<endl<<"Enter Year: "<<year;
        cout<<endl<<"Enter social security number: "<<sSocSecurityNum;
        cout<<endl<<"Enter Age: "<<sAge;
        cout<<endl<<"Enter Gender: "<<sGender;
        cout<<endl<<"Enter Address: "<<sAddress;
        cout<<endl<<"Enter Telephone Number: "<<sTelephoneNum;

        cout<<endl<<"Enter department: "<<department;
        cout<<endl<<"Enter job title: "<<jobTitle;
        cout<<endl<<"Enter hourly rate: "<<hourlyRate;
        cout<<endl<<"Enter union dues: "<<unionDues;
    }
};

int main()
{
    Person pers;
    Employee emp;

    Student *virtual_stud=nullptr;
    char chMenu=0;

    while(1)
    {
        cout<<endl<<"Select: "<<endl<<" 1. Person"<<endl<<" 2. Student"<<endl<<" 3.
Exit"<<endl;
        cin>>chMenu;
        if(chMenu=='1'){virtual_stud=( Student*)&pers;}if(chMenu=='2'){virtual_stud=(
Student*)&emp;}
        if(chMenu=='3'){break;}

        cout<<"Select: "<<endl<<" 1. Enter"<<endl<<" 2. Display"<<endl<<" 3.
Exit"<<endl;
    }
}

```

```

        cin>>chMenu;
        if(chMenu=='1'){virtual_stud->Init();}if(chMenu=='2'){virtual_stud-
>Display();}
        if(chMenu=='3'){break;}
    }

    cin>>chMenu;
    return 0;
}

```

Solution #2:

```

public static bool sameElements(int[] a, int[] b)
{
    int buf = 0;

    if (a[0] > b[0]) { buf = b[0]; }
    else { buf = a[0]; }

    for (int i = 0; i < buf; i++)
    {
        if (a[i] % i == 0 && b[i] % i == 0) { return false; }
    }

    return true;
}

```