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// Made and compiled in VS code editor.
#include<iostream>
#include<vector>
using namespace std;

class Person{          // Base Class
public:
    string fname,lname;
};

class Student:public Person{ // Derived Class
private:
    long idno;
    int n;
    int *marks = new int[n]; // Dynamically creating array in heap with new keyword
public:
    Student(){}; // Default constructor if parameterized Constructor is not called
    Student(string fname,string lname,long idno,int n,int marks[]){
        this->fname = fname;
        this->lname = lname;
        this->idno = idno;
        this->n = n;
        this->marks[n] = {}; // Initialize all the member to zero
    }
    void getData(){ // This function allows user to get data from the user
        int n;
        cin>>lname;
        cin>>fname;
        cin>>idno;
        cin>>n;
        for(int x=0;x<n;x++)
            cin>>marks[x];
    }
    char calculate(){ // This function calculates and return the grade
        float sum = 0.0;char grade;
        for(int x=0;x<n;x++){
            sum += marks[x];
        }
        sum = sum/n;
        if(sum >= 0 && sum < 40)
            grade = 'T';
        else if(sum>=40 && sum< 55)
            grade = 'D';
        else if(sum>=55 && sum< 70)
            grade = 'P';
        else if(sum>=70 && sum< 80)
            grade = 'A';
        else if(sum>=80 && sum< 90)
            grade = 'E';
        else
            grade = 'O';
        return grade;
    }
}

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void showResult(){ // This function displays grade and detail of student
    cout<<"Name: "<<fname<<"<<lname<<"\n";
    cout<<"ID: "<<idno<<"\n";
    cout<<"Grade: "<<calculate();
}
};

int main(){
    Student s1;
    s1.getData();
    s1.showResult();
    return 0;
}

```

// solution 2: Implementation using vector

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/*
class Person{
    public:
        string fname,lname;
};

class Student:public Person{
    private:
        long idno;
        vector<int> marks;
    public:
        Student(){};
        Student(string fname,string lname,long idno,vector<int> marks){
            this->fname = fname;
            this->lname = lname;
            this->idno = idno;
            this->marks = {0};
        }
        void getData(){
            int n;
            cin>>lname;
            cin>>fname;
            cin>>idno;
            cin>>n;
            for(int x =0;x<n;x++){
                int mark;cin>>mark;
                marks.push_back(mark);
            }
        }
        char calculate(){
            float sum = 0.0;char grade;
            for(int x:marks){
                sum += x;
            }
            sum = sum/marks.size();
            if(sum >= 0 && sum < 40)
                grade = 'T';

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        else if(sum>=40 && sum< 55)
            grade = 'D';
        else if(sum>=55 && sum< 70)
            grade = 'P';
        else if(sum>=70 && sum< 80)
            grade = 'A';
        else if(sum>=80 && sum< 90)
            grade = 'E';
        else
            grade = 'O';
        return grade;
    }
    void showResult(){
        cout<<"Name: "<<fname<<" "<<lname<<"\n";
        cout<<"ID: "<<idno<<"\n";
        cout<<"Grade: "<<calculate();
    }
};

int main(){
    Student s1;
    s1.getData();
    s1.showResult();
    return 0;
}*/

```