



Assignment Project Exam Help

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#include <iostream>
#include <string>
#include <cassert>

using namespace std;

class University {
private:
    string name;
public:
    University(string _name) {
        name = _name;
    }
    string get_name() { return name; }
};

class Contestant {
private:
    string name;
    University *uni;
    int age;
    bool captain, registered_student;
public:
    Contestant(string _name, University &uni, int _age, bool _registered_student,
        bool _captain = false) {
        name = _name;
        uni = &uni;
        age = _age;
        captain = _captain;
        registered_student = _registered_student;
    }

    int get_age() const { return age; }
    bool get_captain() const { return captain; }
    bool is_valid(string team_uni) const {
        return (age >= 18 && age <= 40) && (registered_student) && team_uni == uni->
get_name();
    }
    void change_university(University &uni) { uni = &uni; }
    void graduate() { uni = NULL; registered_student = false; }
};

class Team {
private:
    Contestant *member[4];
    University *uni;
    int members;
public:
    Team(University &u) {
        members = 0;
        uni = &u;
        for (int n=0; n<4; n++)
            member[n] = NULL;
    }

    bool add_member(Contestant &c) {
        if (members >= 4)
            return false;
        member[members] = &c;
        members++;
    }

```

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```

double average_age() const {
    assert(members > 0);
    double total = 0;
    for (int n=0; n<members; n++)
        total += member[n]->get_age();
    return total/members;
}

bool is_valid() const {
    if (members != 4)
        return false;
    int captains = 0;
    for (int n=0; n<4; n++) {
        if (!member[n]->is_valid(uni->get_name()))
            return false;
        if (member[n]->get_captain())
            captains++;
    }
    return (captains == 1) && average_age() < 25.0;
};

int main() {
    University imperial("Imperial");
    Team team(imperial);

    Contestant ivor("Ivor Bigbrain", imperial, 20, true),
        prezza("Prezza Buzza", imperial, 18, true),
        ivonna("Ivonna Singh", imperial, 25, true, true),
        yaman("Yaman Gogul", imperial, 32, true);

    team.add_member(ivor);
    team.add_member(prezza);
    team.add_member(ivonna);
    team.add_member(yaman);
    prezza.graduate();

    cout << "Imperial's team is ";
    if (!team.is_valid())
        cout << "NOT ";
    cout << "valid." << endl;

    return 0;
}

```