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#include <iostream>
using namespace std;

class Dathuc
{
    float *hs;
    int n;
public:
    Dathuc();
    Dathuc(float a[], int n);
    Dathuc(const Dathuc &f);
    ~Dathuc()
    {
        if (hs)
            delete[] hs;
    }
    friend ostream & operator << (ostream &, Dathuc &);
    friend istream & operator >> (istream &, Dathuc &);
    float operator[](int i) const // index operator - toan tu chi so
    {
        if (i >= 0 && i <= n)
            return hs[i];
        return 0.0f;
    }
    Dathuc & operator=(const Dathuc & f);
    bool operator==(const Dathuc &f);
    Dathuc operator + (const Dathuc &);
    Dathuc operator - (const Dathuc &);
    Dathuc operator * (const Dathuc &);
    Dathuc operator * (float);
    float operator()(float x) const
    {
        return evaluate(x);
    }
    float evaluate(float x) const;
};

Dathuc::Dathuc(const Dathuc & f)
{
    n = f.n;
    hs = new float[n + 1];
    int i;
    for (i = 0; i <= n; ++i)
        hs[i] = f[i];
}

Dathuc Dathuc::operator * (const Dathuc &f)
{
    int i, j;
    int n1;
    float * hs1;
    float tam;
    n1 = n + f.n;

    hs1 = new float[n1 + 1];
    for (i = 0; i <= n1; ++i)
    {
        tam = 0.0f;
        for (j = 0; j <= i && j <= n; ++j)
            tam += hs[j] * f[i - j];
        hs1[i] = tam;
    }
}
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    }

    return Dathuc(hs1, n1);
}

Dathuc Dathuc::operator * (float d)
{
    int i;
    int n1;
    float * hs1;
    n1 = n;
    hs1 = new float[n1];
    for (i = 0; i <= n1; ++i)
        hs1[i] = (Dathuc(*this))[i] * d;
    return Dathuc(hs1, n1);
}

bool Dathuc::operator==(const Dathuc &f)
{
    int i;
    if (n == f.n)
    {
        for (i = 0; i <= n; ++i)
            if (hs[i] - f[i] == 0.0f)
                return false;
        return true;
    }
    return false;
}

Dathuc Dathuc::operator + (const Dathuc &f)
{
    int i;
    int n1;
    float * hs1;
    if (n > f.n)
        n1 = n;
    else
        n1 = f.n;
    hs1 = new float[n1 + 1];
    for (i = 0; i <= n1; ++i)
        hs1[i] = (*this)[i] + f[i];
    return Dathuc(hs1, n1);
}

Dathuc Dathuc::operator - (const Dathuc &f)
{
    int i;
    int n1;
    float * hs1;
    Dathuc tam = (*this)*(-1.0f);
    Dathuc t = (tam + f);
    n1 = t.n + 1;
    while (t[n1] == 0.0f && n1 >= 0)
        n1--;
    hs1 = new float[n1 + 1];
    for (i = 0; i <= n1; ++i)
        hs1[i] = t[i] * (-1);
    return Dathuc(hs1, n1);
}

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ostream & operator << (ostream & os, Dathuc & f)
{
    int i;
    for (i = f.n; i>0; --i)
    {
        if (0.0f != f[i])
        {
            os << f[i] << "*x^" << i;
            if (f[i - 1]>0)
                os << " + ";
            else
                os << " - ";
        }
    }
    os << f[0];
    return os;
}

istream & operator >> (istream & is, Dathuc & f)
{
    int i;
    cout << "Nhap bac da thuc:";
    is >> f.n;
    if (f.hs)
        delete[] f.hs;
    f.hs = new float[f.n + 1];
    for (i = f.n; i >= 0; --i)
    {
        cout << "Nhap he so bac " << i << ":";
        is >> f.hs[i];
    }
    return is;
}

Dathuc::Dathuc()
{
    n = -1;
    hs = NULL;
}

Dathuc::Dathuc(float a[], int n1)
{
    n = n1;
    hs = new float[n + 1];
    int i;
    for (i = 0; i <= n; ++i)
        hs[i] = a[i];
}

Dathuc & Dathuc::operator=(const Dathuc &f)
{
    int i;
    if (!(*this == f))
    {
        if (hs)
            delete[] hs;
        n = f.n;
        hs = new float[n + 1];
        for (i = 0; i <= n; ++i)
            hs[i] = f[i];
    }
}
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    }
    return *this;
}

float Dathuc::evaluate(float x)const
{
    float tam = hs[n];
    int i;
    for (i = n; i>0; --i)
        tam = tam*x + hs[i - 1];
    return tam;
}

int main()
{
    float a[] = { 1.0f, -1.2f };
    int i;
    Dathuc f1;
    Dathuc f2;
    cin >> f1;
    cin >> f2;
    cout << f1 << endl;
    cout << f2 << endl;

    Dathuc f3 = (f1 + f2);
    Dathuc f4 = (f1 * f2 * f3);
    cout << f1 << endl;
    cout << f4 << endl;
    cout << f3 << endl;
    cout << f2 << endl;
    cout << f1(1.2f) << endl;
    f3 = (f4 - f2);
    cout << f3 << endl;
    system("pause");
    return 0;
}

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