**Длинная арифметика**

**Сумма**

string num1, num2, sum, s2;

int fl;

string reverse( string s)

{

int n = (int)s.SZ;

for (int i=0; i < n/2; i++)

swap(s[i], s[n-i-1]);

return s;

}

void pl(int ind, int z2)

{

// cout << ind << " " << " " << z2 << endl;

int zn = (sum[ind]-'0') + z2;

if ( zn <= 9 ) sum[ind] = (char)(zn + '0');

else

{

sum[ind] = (char)(zn%10+'0');

if (ind == sum.SZ-1) {sum += (char)(zn/10 +'0'); fl = 1;}

else sum[ind+1] = (char)( ((sum[ind+1]-'0') + zn/10) +'0');

}

// cout << sum[ind] << endl;

ind++;

if (ind != sum.SZ && !fl) pl(ind, s2[ind]-'0');

}

void get\_sum(string s1, string ss2)

{

if (s1.SZ < s2.SZ) swap(s1, s2);

sum = reverse(s1);

s2 = reverse(ss2);

for (int i = s2.SZ; i < sum.SZ; i++)

{

s2 += '0';

}

//cout << s1 << " " << s2 << endl;

pl(0, s2[0]-'0');

}

void in()

{

ifstream cin("input.txt");

cin >> num1 >> num2;

}

void solution()

{

get\_sum(num1, num2);

//cout << sum << endl;

sum = reverse(sum);

}

**Вычитание**

string num1, num2, raz, str;

int fl;

string reverse( string s)

{

int n = (int)s.SZ;

for (int i=0; i < n/2; i++)

swap(s[i], s[n-i-1]);

return s;

}

void mn(int ind, int z)

{

int z1 = (raz[ind]-'0');

if (z1-z >= 0)

{

if (!fl) raz[ind] = (char)(z1-z+'0');

else

{

if (z1-z-1 >= 0) {raz[ind] = (char)(z1-z-1+'0'); fl = 0;}

else raz[ind] = (char)(z1-z+9+'0');

}

}

else

{

if (fl) raz[ind] = (char)(z1-z+9+'0');

else {raz[ind] = (char)(z1-z+10+'0'); fl = 1;}

}

//cout << ind << " " << z1 << " " << z << " " << raz[ind] << endl;

ind++;

if (ind != raz.SZ) mn(ind, str[ind]-'0');

}

void subtr(string s1, string s2)

{

s1 = reverse(s1);

raz = s1;

s2 = reverse(s2);

for (int i = s2.SZ; i < s1.SZ; i++)

{

s2 += '0';

}

str = s2;

mn(0, str[0]-'0');

}

void in()

{

//ifstream cin("input.txt");

cin >> num1 >> num2;

}

void solution()

{

subtr(num1, num2);

raz = reverse(raz);

int smb = raz[0];

while (smb == '0')

{

raz.erase(0,1);

smb = raz[0];

}

}

**Умножение**

string num1, num2, rez, s1, s2, s3, sum="0";

int st, dop, fl;

void pl(int ind, int z2)

{

// cout << ind << " " << " " << z2 << endl;

int zn = (sum[ind]-'0') + z2;

if ( zn <= 9 ) sum[ind] = (char)(zn + '0');

else

{

sum[ind] = (char)(zn%10+'0');

if (ind == sum.SZ-1) {sum+= (char)(zn/10 +'0'); fl = 1;}

else sum[ind+1] = (char)( ((sum[ind+1]-'0') + zn/10) +'0');

}

// cout << sum[ind] << endl;

ind++;

if (ind != sum.SZ && !fl) pl(ind, s3[ind]-'0');

}

string reverse( string s)

{

int n = (int)s.SZ;

for (int i=0; i < n/2; i++)

swap(s[i], s[n-i-1]);

return s;

}

void get\_sum(string ss2)

{

s3 = ss2;

for (int i = s3.SZ; i < sum.SZ; i++)

{

s3 += '0';

}

//cout << s1 << " " << s2 << endl;

pl(0, s3[0]-'0');

}

void ymn (int mn, int ind, int z)

{

// cout << mn << " " << ind << " " << z << endl;

int zn = mn\*z;

//cout << "ZN = " << zn << endl;

if (rez.SZ >= ind+1) rez[ind] = char(rez[ind]-'0' + zn%10 + '0');

else rez += char(zn%10 + '0');

if (rez.SZ >= ind+2) rez[ind+1] = char(rez[ind+1]-'0' + zn/10 + '0');

else rez += char(zn/10 + '0');

ind++;

if (ind < s2.SZ) ymn (mn, ind, s2[ind]-'0');

}

void mlp (string ss1, string ss2)

{

s1 = reverse(ss1);

s2 = reverse(ss2);

//cout << "s1= " << s1 << endl;

//cout << "s2= " << s2 << endl;

for (int i = 0 ; i < s1.SZ; i++)

{

ymn(s1[i]-'0', 0, s2[0]-'0');

for (int j = 0; j < st; j++)

{

rez = '0'+rez;

}

for (int j = sum.SZ; j < rez.SZ; j++)

{

sum +='0';

}

// cout << rez << endl;

get\_sum(rez);

//cout << sum << endl;

st++;

rez="";

}

}

void in()

{

//ifstream cin("input.txt");

cin >> num1 >> num2;

}

void solution()

{

if (num1.SZ < num2.SZ) swap(num1, num2);

mlp(num1, num2);

sum = reverse(sum);

int smb = sum[0];

while (smb == '0')

{

sum.erase(0,1);

smb = sum[0];

}

}