```cpp
const int MAXN = 5000;
const int QTD = 2;
int B[] = {31,97};
int MODH[] = {1000000007,1000000009};
int pwr[MAXN][QTD];
int h[MAXN][QTD];
string s;
int n;

void precalc() {
    FOR0(j,QTD) {
        h[0][j] = s[0]%MODH[j];
        pwr[0][j] = 1%MODH[j];
        FOR(i,1,n) {
            h[i][j] = (h[i-1][j]*1LL*B[j] + s[i])%MODH[j];
            pwr[i][j] = pwr[i-1][j]*1LL*B[j]%MODH[j];
        }
    }
}

void calc(int x, int y, int ans[QTD]) {
    if (x>y) return;
    FOR0(j,QTD) {
        ans[j] = (h[y][j] - (x ? h[x-1][j] : 0)*1LL*pwr[y-x+1][j])%MODH[j];
        if (ans[j] < 0) ans[j] += MODH[j];
    }
}

bool is eq(int x1, int y1, int x2, int y2) {
    int aux1[QTD], aux2[QTD];
    calc(x1,y1,aux1);
    calc(x2,y2,aux2);
    FOR0(i,QTD) if (aux1[i] != aux2[i]) return false;
    return true;
}

bool is less(int x1, int y1, int x2, int y2) {
    int sz1 = y1-x1+1, sz2 = y2-x2+1;
    int beg = 0, end = min(sz1,sz2);
    while (beg < end) {
        int mid = (beg+end)/2;
        if (!is eq(x1,x1+mid, x2, x2+mid)) end = mid;
        else beg = mid + 1;
    }
    if (end == min(sz1,sz2)) return (sz1 < sz2);
    return s[x1+end] < s[x2+end];
}

```