gen.cpp Page 1

```
#include <bits/stdc++.h>
using namespace std;
                   ios_base::sync_with_stdio(false); cin.tie (nullptr)
#define IOS
#define PREC
                   cout.precision (10); cout << fixed</pre>
#if __cplusplus > 201103L
seed_seq seq{
  (uint64_t) chrono::duration_cast<chrono::nanoseconds>
    (chrono::high_resolution_clock::now().time_since_epoch()).count(),
     (uint64_t) __builtin_ia32_rdtsc(),
     (uint64_t) (uintptr_t) make_unique<char>().get()
};
mt19937 rng(seq);
#else
auto seed = chrono::high_resolution_clock::now().time_since_epoch().count();
mt19937 rng(seed);
#endif
template <class F = int>
class Rand {
  private:
    static const F __LOW = numeric_limits<F>::min();
static const F __HIGH = numeric_limits<F>::max();
    F gvUnifRand (const F& low = __LOW, const F& high = __HIGH) {
      assert(low <= high);</pre>
      return uniform_int_distribution <F> (low, high) (rng); //closed interval [low,
high]
    F gvRand (const F& low = __LOW, const F& high = __HIGH) {
         ' if (is_floating_point<F>::value)                     return gvUnifRand (low, high);
      // else return gvFineRand (low, high);
      return gvUnifRand(low, high);
    }
};
template <class T = int>
class KuchBhiDedo {
  public:
    static const T __LOW = numeric_limits<T>::min();
static const T __HIGH = numeric_limits<T>::max();
    Rand <T> rndT;
    Rand <int> rndInt;
    vector <T> gvVec(int n, const T& low = __LOW, const T& high = __HIGH) {
      vector <T> v(n);
      for_each(v.begin(), v.end(), [\&] (T &x) -> void { x = rndT.gvRand (low, high);
 });
      return v;
    set <T> gvSet (int n, const T& low = __LOW, const T& high = __HIGH) {
      assert (high - low + 1 >= n);
      set <T> s;
      while (static_cast <int> (s.size()) != n)
        s.insert(rndT.gvRand (low, high));
      return s;
    vector <T> gvVecUnique (int n, const T& low = __LOW, const T& high = __HIGH) {
      set <T> s = gvSet(n, low, high);
      vector <T> v (s.begin(), s.end());
      random_shuffle(v.begin(), v.end());
      return v;
    string gvString (int n, bool lowerCaseOnly = true) {
      string s(n, 'x');
      for (char &ch : s) {
         if (lowerCaseOnly) ch = static_cast <char>('a' + rndInt.gvRand (0, 25));
         else {
```

gen.cpp Page 2

```
bool up = rndInt.gvRand (0, 1);
ch = static_cast <char> ((up ? 'A' : 'a') + rndInt.gvRand (0, 25));
      return s;
    vector <vector <T>> gvMat (int mnn, int mxn, const T& low = __LOW, const T& high
 = ___HIGH) {
      int n = rndInt.gvRand (mnn, mxn), m = rndInt.gvRand (mnn, mxn);
      vector <vector <T>> mat(n, vector <T> (m));
      cout << n << ' ' << m << '\n';
      for (auto &row : mat) {
        for (T& c : row)
          cout << (c = rndT.gvRand (low, high)) << ' ';</pre>
        cout << '\n';
      }
      return mat;
    }
    vector <int> gvPerm (int n) {
      vector <int> pi(n);
      iota(pi.begin(), pi.end(), 0);
random_shuffle(pi.begin(), pi.end());
      return pi;
    }
    void gvTree (int mnn, int mxn, const T& low = __LOW, const T& high = __HIGH) {
      int n = rndInt.gvRand (mnn, mxn);
      cout << n << '\n';
      vector <int> isomorph = gvPerm(n);
       vector <T> nodeValue = gvVec(n, low, high);
      // for (T x : nodeValue) { cout << x << ^{\prime} '; } cout << ^{\prime} \n'; // uncomment to
have NODE VALUES
      vector <pair <int, int>> edges;
      for (int u = 1; u < n; ++u) {
        bool swp = rndInt.gvRand (0, 1);
         int pr = rndInt.gvRand (0, u - 1);
         edges.push_back(swp ? make_pair(isomorph[u], isomorph[pr]) : make_pair(isomo
rph[pr], isomorph[u])); // undirected edge
      random_shuffle(edges.begin(), edges.end());
      for (auto e : edges) {
        cout << e.first + 1 << ' ' << e.second + 1 <<
    // ' ' << rndT.gvRand (low, high) << // uncomment to have EDGE VALUES</pre>
           "\n";
    }
    void gvDag (int mnn, int mxn, const T& low = __LOW, const T& high = __HIGH) {
      int n = rndInt.gvRand (mnn, mxn);
      int m = 0;
      vector <int> isomorph = gvPerm(n);
      vector <pair <int, int>> edges;
      for (int u = 0; u < n - 1; ++u) {
         int remVer = n - 1 - u;
        int k = rndInt.gvRand (0, remVer);
        m += k;
         set \langle int \rangle neigh = gvSet(k, u + 1, n - 1);
         for (int v : neigh)
           edges.push_back(make_pair(isomorph[u], isomorph[v])); // directed edge
      random_shuffle(edges.begin(), edges.end());
      cout << n << ' ' << m << '\n';
      vector <T> nodeValue = gvVec(n, low, high);
// for (T x : nodeValue) { cout << x << ' '; } cout << '\n'; // uncomment to</pre>
```

gen.cpp Page 3

have NODE VALUES

```
"\n";
     }
   }
};
template <class T = int> T giveRand (const T& low, const T& high) {
  auto seed = chrono::high_resolution_clock::now().time_since_epoch().count();
  mt19937 mt_rand(seed);
  return uniform_int_distribution<T> (low, high) (mt_rand); //closed interval [low,
high]
}
signed main() {
 IOS; PREC;
 KuchBhiDedo <int> k;
 int tc = 1;
 // cout << tc << '\n';
 while (tc--) {
   int n = (int)2e5 - 1;
   cout << n + 1 << '\n';
   while (n--) {
     cout << (int)1e9 << ' ';
     // cout << giveRand((int)1e9 - (int)1e5, (int)1e9) << ' ';
   cout << (int)1 << '\n';
   // cout << '\n';
 }
 return EXIT_SUCCESS;
}
```