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A	B	C	D	E	F	sum
100	100	100	35	20	92	447

Task A

```
#include <bits/stdc++.h>

#define pb push_back
#define int long long

using namespace std;
typedef long long i64;

signed main() {
  ios::sync_with_stdio(0);
  cin.tie(0);

#ifdef local
  freopen("input.in", "r", stdin);
#endif

  int a, b, n;
  cin >> a >> b >> n;

  int res = 0;
  if (n >= a) {
    for (int s = 1; s <= a; ++s) {
      vector<int> dp(n + 1, 0);
      dp[s] = 1;
      for (int i = s + 1; i <= n; ++i) {
        if (i >= a) dp[i] += dp[i - a];
        if (i >= b) dp[i] += dp[i - b];
      }
      res += dp[n - (a - s)];
```

```
    }
  }
  if (n >= b) {
    for (int s = 1; s <= b; ++s) {
      vector<int> dp(n + 1, 0);
      dp[s] = 1;
      for (int i = s + 1; i <= n; ++i) {
        if (i >= a) dp[i] += dp[i - a];
        if (i >= b) dp[i] += dp[i - b];
      }
      res += dp[n - (b - s)];
    }
  }

  cout << res << '\n';
}
```

Task B

```
#include <bits/stdc++.h>
#pragma GCC optimize("O3")

#define pb push_back

using namespace std;
typedef long long i64;

const i64 inf = 1e18;

// i64 abs(i64 x) {
//  return x >= 0 ? x : -x;
// }

i64 dist(i64 x1, i64 y1, i64 z1, i64 x2, i64 y2, i64 z2) {
  return max({abs(x1 - x2), abs(y1 - y2), abs(z1 - z2)});
}

int main() {
  ios::sync_with_stdio(0);
  cin.tie(0);

#ifdef local
  freopen("input.in", "r", stdin);
#endif

  i64 n; cin >> n;
  i64 x1, y1, z1;
  cin >> x1 >> y1 >> z1;
  i64 x2, y2, z2;
  cin >> x2 >> y2 >> z2;
  i64 res = max({abs(x1 - x2), abs(y1 - y2), abs(z1 - z2)});

  for (i64 x = 0; x <= n; ++x) {
```

```
    i64 y = n - x;
    i64 z = -n;
    // assert(x + y + z == 0);
    i64 d = dist(x1, y1, z1, x, y, z);
    d += dist(x - n, y - n, -z, x2, y2, z2);
    res = min(res, d);
    d = dist(x2, y2, z2, x, y, z);
    d += dist(x - n, y - n, -z, x1, y1, z1);
    res = min(res, d);
  }

  for (i64 y = 0; y <= n; ++y) {
    i64 z = n - y;
    i64 x = -n;
    // assert(x + y + z == 0);
    i64 d = dist(x1, y1, z1, x, y, z);
    d += dist(-x, y - n, z - n, x2, y2, z2);
    res = min(res, d);
    d = dist(x2, y2, z2, x, y, z);
    d += dist(-x, y - n, z - n, x1, y1, z1);
    res = min(res, d);
  }

  for (i64 z = 0; z <= n; ++z) {
    i64 x = n - z;
    i64 y = -n;
    // assert(x + y + z == 0);
    i64 d = dist(x1, y1, z1, x, y, z);
    d += dist(x - n, -y, z - n, x2, y2, z2);
    res = min(res, d);
    d = dist(x2, y2, z2, x, y, z);
    d += dist(x - n, -y, z - n, x1, y1, z1);
    res = min(res, d);
  }

  cout << res << '\n';
}
```

Task C

```
#include <bits/stdc++.h>

#define pb push_back

using namespace std;
typedef long long i64;

const int mod = 1e9 + 7;
const int N = 3e5 + 228;
const int k = 7;
// code double hashes?

int sum(int a, int b, int mod) {
```

```
  return a + b >= mod ? a + b - mod : a + b;
}

int mul(int a, int b, int mod) {
  return 1ll * a * b % mod;
}

int pw[N];

void first() {
  int n; cin >> n;
  string s; cin >> s;
  int hsh = 0;
  for (int i = 0; i < n; ++i) {
    hsh = sum(hsh, mul(s[i] - '0' + 1, pw[i + 1], mod), mod);
  }
  hsh = mul(hsh, pw[N - 1], mod);
  cout << hsh << '\n';
}

int ht[N];

void second() {
  int n; cin >> n;
  string t; cin >> t;
  ht[0] = 0;
  t += t;
  int hsh; cin >> hsh;
  for (int i = 1; i <= 2 * n; ++i) {
    ht[i] = sum(ht[i - 1], mul(t[i - 1] - '0' + 1, pw[i], mod), mod);
    if (i >= n) {
      int chsh = sum(ht[i], mod - ht[i - n], mod);
      chsh = mul(chsh, pw[N - (i - n + 1)], mod);
      if (chsh == hsh) {
        cout << "YES\n";
        return ;
      }
    }
  }
  cout << "NO\n";
}

int main() {
  ios::sync_with_stdio(0);
  cin.tie(0);

#ifdef local
  freopen("input.in", "r", stdin);
#endif

  pw[0] = 1;
  for (int i = 1; i < N; ++i) {
    pw[i] = mul(pw[i - 1], k, mod);
```

```
  }

  string q; cin >> q;
  if (q == "first") {
    first();
  } else {
    second();
  }
}
```

Task D

```
#include <bits/stdc++.h>

#define pb push_back

using namespace std;
typedef long long i64;

char swp(int i, int j) {
  cout << i << ' ' << j << endl;
  char res; cin >> res;
  if (res == '!') exit(0);
  return res;
}

int main() {
  ios::sync_with_stdio(0);
  cin.tie(0);

#ifdef local
  freopen("input.in", "r", stdin);
#endif

  int n; cin >> n;
  auto ver = swp(1, 1);
  while (1) {
    if (ver == '>') {
      ver = swp(1, 2);
    } else {
      ver = swp(1, 1);
    }
  }
}
```

Task E

```
#include <bits/stdc++.h>

#define pb push_back

using namespace std;
```

```
typedef long long i64;

const int N = 1e5 + 228;
const int M = 2e7 + 228;
vector<int> g[N];
int cur[N], t[N];
int ans[M];
int ineq = 0;
int moment = 0;

int main() {
  ios::sync_with_stdio(0);
  cin.tie(0);

#ifdef local
  freopen("input.in", "r", stdin);
#endif

  int n, q;
  cin >> n >> q;

  for (int i = 1; i <= n; ++i) {
    int d; cin >> d;
    while (d--) {
      int x; cin >> x;
      g[i].pb(x);
    }
  }

  for (int i = 0; i < q; ++i) {
    cin >> t[i];
  }

  int v = 1;
  ans[0] = 1;
  while (moment < M) {
    int sz = (int)g[v].size();
    int u = g[v][cur[v]];
    if (!cur[v]) ++ineq;
    cur[v] += 1;
    cur[v] %= sz;
    if (!cur[v]) --ineq;
    v = u;
    ++moment;
    ans[moment] = v;
    if (v == 1 && !ineq) {
      break;
    }
  }

  for (int i = 0; i < q; ++i) {
    cout << ans[t[i] % moment] << " \n"[i == q - 1];
  }
```

```
}
```

Task F

```
#include <bits/stdc++.h>

#define pb push_back

using namespace std;
typedef long long i64;

const int inf = 1e9;
mt19937 rnd(228);

auto start = clock();
int n, m;
vector<vector<int>> a;
vector<pair<int, int>> ord;
vector<vector<char>> ans;
i64 best = 0;
double P = 1.0;

bool togo() {
  double e = (double)(rnd() % inf) / (double)inf;
  // cout << fixed << e << ' ' << P << ' ' << (e <= P) << '\n';
  return e <= P;
}

void go() {
  vector<pair<int, int>> dir = {
    {-1, 0}, {1, 0}, {0, 1}, {0, -1}
  };
  vector<vector<char>> cur(n, vector<char> (m, '.'));
  i64 score = 0;
  for (auto [x, y] : ord) {
    int X = x, Y = y;
    sort(dir.begin(), dir.end(), [&] (auto d1, auto d2) {
      int nx1 = (X + n + d1.first) % n;
      int ny1 = (Y + m + d1.second) % m;
      int score1 = a[X][Y] * a[nx1][ny1];
      int nx2 = (X + n + d2.first) % n;
      int ny2 = (Y + m + d2.second) % m;
      int score2 = a[X][Y] * a[nx2][ny2];
      return score1 > score2;
    });
    for (auto [dx, dy] : dir) {
      int nx = (x + n + dx) % n;
      int ny = (y + m + dy) % m;
      if (cur[x][y] == '.' && cur[nx][ny] == '.' && togo()) {
        score += a[x][y] * a[nx][ny];
        if (dx == 1) {
          cur[x][y] = 'T';
          cur[nx][ny] = 'B';
```

```
        } else if (dx == -1) {
          cur[x][y] = 'B';
          cur[nx][ny] = 'T';
        } else if (dy == 1) {
          cur[x][y] = 'L';
          cur[nx][ny] = 'R';
        } else {
          cur[x][y] = 'R';
          cur[nx][ny] = 'L';
        }
      }
    }
  }
  if (score > best) {
    best = score;
    ans = cur;
  }
}

bool tl() {
  return ((double)(clock() - start) / CLOCKS_PER_SEC >= 1.9);
}

int main() {
  ios::sync_with_stdio(0);
  cin.tie(0);

#ifdef local
  freopen("input.in", "r", stdin);
#endif

  cin >> n >> m;
  a.assign(n, vector<int> (m, 0));
  ans.assign(n, vector<char> (m, '.'));
  for (int i = 0; i < n; ++i) {
    for (int j = 0; j < m; ++j) {
      char c; cin >> c;
      a[i][j] = c - '0';
      ord.push_back({i, j});
    }
  }

  sort(ord.begin(), ord.end(), [&] (auto x1, auto x2) {
    return a[x1.first][x1.second] > a[x2.first][x2.second];
  });

  while (!tl()) {
    go();
    P *= 0.99999;
  }

  cout << best << '\n';
  for (int i = 0; i < n; ++i) {
```

```
    for (int j = 0; j < m; ++j) {
      cout << ans[i][j];
    }
    cout << '\n';
  }
}
```