Painting the Fence

diff：表示当最后两块颜色不同的方案数

same：表示当最后两块颜色相同的方案数

total ways = diff + same

1. n = 1, diff = k, same = 0, total = k
2. n = 2, diff = k * (k - 1), same = k, total = k + k * (k - 1)
3. n = 3, diff = [k + k * (k - 1)] * (k - 1), same = k * (k - 1)

又因为 total[i] = same[i] + diff[i]

综上得到

same[i] = diff[i - 1]

diff[i] = (diff[i-1] + diff[i-2]) * (k-1) = total[i - 1] * (k - 1)

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

#define MOD 1000000007
#define MAX 100001
using namespace std;

// dp[i] 表示用k种颜色涂i个方块的方案
vector<long long int> dp(MAX);
void paintingFence(int k) {
    dp[1] = k;
    int same = 0, diff = k;
    for (int i = 2; i < dp.size(); ++i) {
        same = diff;
        diff = (dp[i - 1] * (k - 1)) % MOD;
        dp[i] = (same + diff) % MOD;
    }
}


int main() {
    int T;
    scanf("%d", &T);
    while (T--) {
        int n, k;
        scanf("%d %d", &n, &k);
        paintingFence(k);
        printf("%lld\n", dp[n]);
    }
}
```