

nCr

```
C(n, r) = C(n-1, r-1) + C(n-1, r)
C(n, 0) = C(n, n) = 1
```

C(4,3)计算过程如下
1=====>> n = 0, C(0,0) = 1
1-1=====>> n = 1, C(1,0) = 1, C(1,1) = 1
1-2-1=====>> n = 2, C(2,0) = 1, C(2,1) = 2, C(2,2) = 1
1-3-3-1=====>> n = 3, C(3,0) = 1, C(3,1) = 3, C(3,2) = 3, C(3,3)=1
1-4-6-4-1=====>> n = 4, C(4,0) = 1, C(4,1) = 4, C(4,2) = 6, C(4,3)=4, C(4,4)=1

```
#include <bits/stdc++.h>
using namespace std;

int nCr(int n, int r, int p) {
    vector<long long int> dp;
    dp.resize(r + 1, 0);
    dp[0] = 1;
    for (int i = 1; i <= n; ++i) {
        for (int j = min(i, r); j > 0; --j) {
            // curent row is i, above row is i-1, right part of is (i-1)Cj + (i-1)(Cj-1)
            dp[j] = (dp[j] + dp[j - 1]) % p;
        }
    }
    return dp[r];
}

int main() {
    int T;
    scanf("%d", &T);
    while (T--) {
        int n, r;
        scanf("%d %d", &n, &r);
        printf("%lld\n", nCr(n, r, 1000000007));
    }
}
```