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| **Fast Power in C++** | |
| #include <iostream>  using namespace std;  class FastPower {  public:  static int fastpower(int a, int b) {  int res = 1;  while (b > 0) {  if (b & 1) {  res = res \* a;  }  a = a \* a;  b = b >> 1;  }  return res;  }  static void main() {  cout << fastpower(3, 5) << endl;  }  };  int main() {  FastPower::main();  return 0;  } | Dry Run Table:  | **Step** | **b (binary)** | **b (decimal)** | **a** | **res** | **Operation** | **Explanation** | | --- | --- | --- | --- | --- | --- | --- | | 0 | 101 | 5 | 3 | 1 |  | Initial values | | 1 | 101 | 5 | 3 | 3 | res = res \* a | LSB is 1 → multiply res by a | | 2 | 10 | 2 | 9 | 3 | a = a \* a, b >>= 1 | Square a → 3² = 9, shift b → b = 2 | | 3 | 10 | 2 | 9 | 3 | (skip multiplication) | LSB is 0 → skip multiplying res | | 4 | 1 | 1 | 81 | 3 | a = a \* a, b >>= 1 | a = 9² = 81, b = 1 | | 5 | 1 | 1 | 81 | 243 | res = res \* a | LSB is 1 → res = 3 × 81 = 243 | | 6 | 0 | 0 |  |  | Done | Loop ends |  ✅ Final Output: 243 |
| 243 | |