1)**sum of squares**

#include <iostream>  
  
int main() {  
    int n;  
    int sum = 0;  
  
    std::cout << "Enter a positive integer: ";  
    std::cin >> n;  
  
    if (n < 1) {  
        std::cout << "Error: Entered number should be greater than or equal to 1." << std::endl;  
        return 0;  
    }  
  
    if (n == 1) {  
        std::cout << "The square of 1 is 1." << std::endl;  
        return 0;  
    }  
  
    for (int i = 1; i <= n; i++) {  
        sum += i \* i;  
    }  
  
    std::cout << "The sum of squares from 1 to " << n << " is " << sum << "." << std::endl;  
  
    return 0;  
}

1. **Guessing game**

#include <iostream>  
#include <cstdlib>  
#include <ctime>  
  
int main() {  
    srand(time(0)); // Seed the random number generator  
  
    int randomNumber = rand() % 100 + 1; // Generate a random number between 1 and 100  
    int guess;  
    int attempts = 0;  
  
    std::cout << "Welcome to the guessing game!" << std::endl;  
  
    do {  
        std::cout << "Enter your guess (between 1 and 100): ";  
        std::cin >> guess;  
  
        attempts++;  
  
        if (guess > randomNumber) {  
            std::cout << "Too high! Guess lower." << std::endl;  
        } else if (guess < randomNumber) {  
            std::cout << "Too low! Guess higher." << std::endl;  
        } else {  
            std::cout << "Congratulations! You guessed the number in " << attempts << " attempts." << std::endl;  
        }  
    } while (guess != randomNumber);  
  
    return 0;  
}

1. **Factorial**

#include <iostream>  
  
int main() {  
    int number;  
    unsigned long long factorial = 1;  
  
    std::cout << "Enter a positive integer: ";  
    std::cin >> number;  
  
    if (number < 0) {  
        std::cout << "Error: Invalid input. Please enter a positive integer." << std::endl;  
        return 0;  
    }  
  
    for (int i = 1; i <= number; ++i) {  
        factorial \*= i;  
    }  
  
    std::cout << "The factorial of " << number << " is " << factorial << std::endl;  
  
    return 0;  
}

1. Grade
2. #include <iostream>  
     
   int main() {  
       int grade;  
     
       std::cout << "Enter a numerical grade (between 0 and 100): ";  
       std::cin >> grade;  
     
       if (grade >= 90 && grade <= 100) {  
           std::cout << "Letter Grade: A" << std::endl;  
       }  
       else if (grade >= 80 && grade < 90) {  
           std::cout << "Letter Grade: B" << std::endl;  
       }  
       else if (grade >= 70 && grade < 80) {  
           std::cout << "Letter Grade: C" << std::endl;  
       }  
       else if (grade >= 60 && grade < 70) {  
           std::cout << "Letter Grade: D" << std::endl;  
       }  
       else if (grade >= 0 && grade < 60) {  
           std::cout << "Letter Grade: F" << std::endl;  
       }  
       else {  
           std::cout << "Error: Invalid grade. Please enter a numerical grade between 0 and 100." << std::endl;  
       }  
     
       return 0;  
   }
3. Vowel/consonant
4. #include <iostream>  
     
   int main() {  
       char ch;  
     
       std::cout << "Enter a single character: ";  
       std::cin >> ch;  
     
       switch (ch) {  
           case 'a':  
           case 'e':  
           case 'i':  
           case 'o':  
           case 'u':  
           case 'A':  
           case 'E':  
           case 'I':  
           case 'O':  
           case 'U':  
               std::cout << ch << " is a vowel." << std::endl;  
               break;  
           default:  
               std::cout << ch << " is a consonant." << std::endl;  
               break;  
       }  
     
       return 0;  
   }
5. Christmas 🎄
6. #include <iostream>  
     
   int main() {  
       int height;  
     
       std::cout << "Enter the height of the Christmas tree: ";  
       std::cin >> height;  
     
       for (int i = 0; i < height; i++) {  
           // Print spaces  
           for (int j = 0; j < height - i - 1; j++) {  
               std::cout << " ";  
           }  
     
           // Print asterisks  
           for (int k = 0; k < 2 \* i + 1; k++) {  
               std::cout << "\*";  
           }  
     
           std::cout << std::endl;  
       }  
     
       // Print trunk  
       for (int i = 0; i < height - 1; i++) {  
           std::cout << " ";  
       }  
       std::cout << "\*" << std::endl;  
     
       return 0;  
   }

7) Multiplication tables

#include <iostream>  
  
int main() {  
    int num;  
  
    std::cout << "Enter an integer: ";  
    std::cin >> num;  
  
    std::cout << "Multiplication table for " << num << ":" << std::endl;  
  
    for (int i = 1; i <= 10; i++) {  
        std::cout << num << " x " << i << " = " << num \* i << std::endl;  
    }  
  
    return 0;  
}