**A**

**PROJECT REPORT**

**ON**

**“CALCULATOR FOR SCINTIFIC OPRATIONS”**

SUBMITTED BY:

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SUBJECT:

# Programming in

# Problem Solving using c++.

Under the guidance of

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**INTRODUCTION**

A scientific calculator is a tool used to perform advanced mathematical operations like trigonometry, logarithms, and exponentiation, beyond basic arithmetic. In C++, we can build a simple scientific calculator using the cmath library, enabling users to perform these operations through a command-line interface. This program helps solve complex equations with user inputs for

| **CODE**    #include <iostream>  #include <cmath> // For mathematical functions  using namespace std;  int main() {  char operation;  double num1, num2;  cout << "Scientific Calculator" << endl;  cout << "Available operations:\n"  << "+ : Addition\n"  << "- : Subtraction\n"  << "\* : Multiplication\n"  << "/ : Division\n"  << "^ : Power\n"  << "r : Square Root\n"  << "s : Sine\n"  << "c : Cosine\n"  << "t : Tangent\n"  << "l : Logarithm base 10\n";    cout << "Enter operation: ";  cin >> operation;  if (operation == '+' || operation == '-' || operation == '\*' || operation == '/' || operation == '^') {  // For basic operations and exponentiation, two inputs are needed  cout << "Enter two numbers: ";  cin >> num1 >> num2;  switch (operation) {  case '+':  cout << "Result: " << num1 + num2 << endl;  break;  case '-':  cout << "Result: " << num1 - num2 << endl;  break;  case '\*':  cout << "Result: " << num1 \* num2 << endl;  break;  case '/':  if (num2 != 0)  cout << "Result: " << num1 / num2 << endl;  else  cout << "Error: Division by zero is undefined!" << endl;  break;  case '^':  cout << "Result: " << pow(num1, num2) << endl;  break;  default:  cout << "Invalid operation!" << endl;  }  }  // For square root, sine, cosine, tangent, and logarithm, one input is needed  else if (operation == 'r') {  // Square Root  cout << "Enter a number: ";  cin >> num1;  if (num1 >= 0)  cout << "Square Root of " << num1 << " = " << sqrt(num1) << endl;  else  cout << "Error: Square root of a negative number is undefined!" << endl;  }  else if (operation == 's') {  // Sine  cout << "Enter an angle in radians: ";  cin >> num1;  cout << "Sine(" << num1 << ") = " << sin(num1) << endl;  }  else if (operation == 'c') {  // Cosine  cout << "Enter an angle in radians: ";  cin >> num1;  cout << "Cosine(" << num1 << ") = " << cos(num1) << endl;  }  else if (operation == 't') {  // Tangent  cout << "Enter an angle in radians: ";  cin >> num1;  cout << "Tangent(" << num1 << ") = " << tan(num1) << endl;  }  else if (operation == 'l') {  // Logarithm base 10  cout << "Enter a positive number: ";  cin >> num1;  if (num1 > 0)  cout << "Logarithm (base 10) of " << num1 << " = " << log10(num1) << endl;  else  cout << "Error: Logarithm is undefined for non-positive numbers!" << endl;  }  else {  cout << "Invalid operation!" << endl;  }      return 0;  }        **OUTPUTE**  Scientific Calculator  Available operations:  + : Addition  - : Subtraction  \* : Multiplication  / : Division  ^ : Power  r : Square Root  s : Sine  c : Cosine  t : Tangent  l : Logarithm base 10  Enter operation:          **EXAMPLE**    Scientific Calculator  Available operations:  + : Addition  - : Subtraction  \* : Multiplication  / : Division  ^ : Power  r : Square Root  s : Sine  c : Cosine  t : Tangent  l : Logarithm base 10  Enter operation: \*  Enter two numbers: 5 4  Result: 20  === Code Execution Successful ===    **CONCLUSION**  In conclusion, a C++ scientific calculator is a useful tool for solving math problems.  It can handle basic operations like addition and subtraction.  It also performs advanced functions like square roots, powers, and trigonometry.  The calculator uses the <cmath> library for these operations.  Users can easily input numbers and get results quickly.  It's simple to use and efficient for solving complex problems.  This program helps understand how coding can make calculations easier.  Overall, it shows how C++ can be used to create practical tools. |  |
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