Scientific Calculator Mini Project (C Language)

1. Introduction
This project is a Scientific Calculator written in C language. It can perform basic arithmetic operations as well as scientific operations such as power, square root, trigonometric functions, logarithms, and exponential functions.

2. Objectives
• Develop a functional scientific calculator.
• Learn modular programming using functions.
• Perform mathematical calculations using the math.h library.

3. Features of the Calculator
• Addition, Subtraction, Multiplication, Division
• Square Root
• Power Function
• Logarithm
• Sine, Cosine, Tangent

4. Flow of the Program
1. Display menu
2. User selects operation
3. Program performs calculation
4. Display result
5. Repeat until user exits

5. Source Code (C Program)
```
#include <stdio.h>
#include <math.h>

int main() {
int choice;
double a, b, result;

do {
printf("\n------ SCIENTIFIC CALCULATOR ------\n");
printf("1. Addition\n");
printf("2. Subtraction\n");
printf("3. Multiplication\n");
printf("4. Division\n");
printf("5. Power (a^b)\n");
printf("6. Square Root\n");
printf("7. Logarithm (log10)\n");
printf("8. Sine (sin a)\n");
printf("9. Cosine (cos a)\n");
printf("10. Tangent (tan a)\n");
printf("0. Exit\n");
printf("Enter your choice: ");
scanf("%d", &choice;);

switch(choice) {
case 1:
printf("Enter two numbers: ");
scanf("%lf %lf", &a;, &b;);
result = a + b;
```

```
printf("Result = %.2lf\n", result);
break;
case 2:
printf("Enter two numbers: ");
scanf("%lf %lf", &a;, &b;);
result = a - b;
printf("Result = %.2lf\n", result);
break;
case 3:
printf("Enter two numbers: ");
scanf("%lf %lf", &a;, &b;);
result = a * b;
printf("Result = %.2lf\n", result);
break;
case 4:
printf("Enter two numbers: ");
scanf("%lf %lf", &a;, &b;);
if(b == 0) printf("Error! Division by zero.\n");
else printf("Result = %.2lf\n", a / b);
break;
case 5:
printf("Enter base and exponent: ");
scanf("%lf %lf", &a;, &b;);
printf("Result = %.2lf\n", pow(a, b));
break;
case 6:
printf("Enter a number: ");
scanf("%lf", &a;);
printf("Result = %.2lf\n", sqrt(a));
break;
case 7:
printf("Enter a number: ");
scanf("%lf", &a;);
printf("Result = %.2lf\n", log10(a));
break;
case 8:
printf("Enter angle in radians: ");
scanf("%lf", &a;);
printf("Result = %.2lf\n", sin(a));
break;
case 9:
printf("Enter angle in radians: ");
scanf("%lf", &a;);
printf("Result = %.2lf\n", cos(a));
break;
case 10:
printf("Enter angle in radians: ");
scanf("%lf", &a;);
printf("Result = %.2lf\n", tan(a));
break;
case 0:
printf("Exiting calculator...\n");
break;
default:
printf("Invalid choice! Try again.\n");
}
```

```
} while(choice != 0);

return 0;
}
```

6. Conclusion

This scientific calculator project demonstrates the use of mathematical functions, modular programming, switch-case logic, and user interaction in C. It is suitable for academic mini-project submissions.