জৱাহৰলাল নেহৰু মহাবিদ্যালয়

JAWAHARLAL NEHRU COLLEGE

A Project Report
On Developing
A Personal Calculator and Unit Converter
Using C-Programming

Master of Science

In Mathematics

Submitted By-

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Under the Guidance of

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DECLARATION

I hereby declare that this project report has been prepared by me during the year 2023-24 under the guidance of Dr. Alok Das in the partial fulfillment of the syllabus for 3rd semester of M.Sc Degree.

I also declare that this project report represents largely my own understandings and words in this topic. This report has been prepared without resorting to plagiarism and adhered to all principles of academic honesty and integrity. No falsified of fabricated data or information has been presented.

Finally I declare that this project report is the outcome of my own efforts and that it has not been submitted elsewhere for the award of any degree.

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2. Input :

(12)

```c
#include <stdio.h>
#include<math.h>
#include<string.h>

void showMainMenu();
void showCalculatorMenu();
void showConversionMenu();
void performCalculatorOperation(int choice);
void performConversion(int choice);

int main()
{
    printf("%40s\n", "Personal Calculator and Converter\n");
    char username[20];
    char password[20];
    char storedUsername[] = "Subhasish";
    char storedPassword[] = "password";
    printf("Enter your Username: ");
    scanf("%s", username);
    printf("Enter your Password: ");
    scanf("%s", password);
    if (strcmp(username, storedUsername) == 0 && strcmp(password, storedPassword) == 0) {
        printf("Login successful! Welcome, %s\n", username);
    } else {
        printf("Login failed. Invalid username or password.\n");
        exit(1);
    }
    int mainChoice;

    do {
        showMainMenu();
        scanf("%d", &mainChoice);

        switch (mainChoice) {
            case 1:
                showCalculatorMenu();
                int calculatorChoice;
                scanf("%d", &calculatorChoice);
                performCalculatorOperation(calculatorChoice);
                break;
            case 2:
                showConversionMenu();
                int conversionChoice;
                scanf("%d", &conversionChoice);
                performConversion(conversionChoice);
                break;
            case 3:
                printf("Exiting the program. Goodbye!\n");
                return 0;
            default:
                printf("Invalid choice. Please try again.\n");
        }
    } while (mainChoice != 3);

    return 0;
}

void showMainMenu() {
    printf("\n%20s", "Main Menu:\n");
    printf("\n1. Calculator\n");
    printf("2. Converter\n");
    printf("3. Exit\n");
    printf("\nEnter your choice: ");
}

void showCalculatorMenu() {
    printf("\nCalculator Menu:\n");
    printf("1. Addition\n");
    printf("2. Subtraction\n");
    printf("3. Multiplication\n");
    printf("4. Division\n");
    printf("5. Modulus\n");
```

```c
    printf("6. Power \n");
    printf("7. Factorial \n");
    printf("8. Square \n");
    printf("9. Cube \n");
    printf("10. Squareroot\n");
    printf("11. Cuberoot\n");
    printf("12. Sin()\n");
    printf("13. Cos()\n");
    printf("14. Tan()\n");
    printf("15. Log\n");
    printf("16. Ln\n");
    printf("17. Percentage\n");
    printf("\nEnter your choice: ");
}

void showConversionMenu() {
    printf("\nConversion Menu:\n");
    printf("1. Distance Conversion\n");
    printf("2. Weight Conversion\n");
    printf("\nEnter your choice: ");
}

void performCalculatorOperation(int choice) {
    double num1, num2, result,a,b;


    switch (choice) {
        case 1:
            printf("\nEnter the first number: ");
             scanf("%lf", &num1);
              printf("\nEnter the second number: ");
              scanf("%lf", &num2);
            result = num1 + num2;
            printf("Result: %.2lf\n", result);
            break;
        case 2:
            printf("Enter the first number: ");
              scanf("%lf", &num1);
             printf("Enter the second number: ");
             scanf("%lf", &num2);
            result = num1 - num2;
            printf("Result: %.2lf\n", result);
            break;
        case 3:
            printf("Enter the first number: ");
              scanf("%lf", &num1);
             printf("Enter the second number: ");
              scanf("%lf", &num2);
            result = num1 * num2;
            printf("Result: %.2lf\n", result);
            break;
        case 4:
            printf("Enter the first number: ");
              scanf("%lf", &num1);
             printf("Enter the second number: ");
              scanf("%lf", &num2);
            if (num2 != 0) {
                result = num1 / num2;
                printf("Result: %.5lf\n", result);
            } else {
                printf("Division by zero is not allowed.\n");
            }
            break;
        case 5:
           printf("\nEnter the numbers you want to find modulus of: \n");
           int a,b;
            scanf("%d%d",&a,&b);
            printf("\nThe modulus of %d and %d is %d\n",a,b,a%b);
            break;
        case 6:
            float e;
           double num1;
```

```
145             double num2;
146             printf("\nEnter the base and the power: \n");
147             scanf("%lf%lf",&num1,&num2);
148             e=pow(num1,num2);
149             printf("\nThe power is %lf \n",e);
150             break;
151         case 7:
152             {
153             int n,factorial;
154             printf("Enter the number you want the factorial of: ");
155             scanf("%d",&n);
156             factorial=1;
157             for(int i=1;i<=n;i++){
158             factorial=factorial*i;
159             }
160
161             printf("\nFactorial of %d is %d\n",n,factorial);
162             }
163             break;
164         case 8:
165             {
166             float num1,p;
167             printf("Enter the number you want the square of: ");
168             scanf("%f",&num1);
169             p=pow(num1,2);
170             printf("The square of %f is %f",num1,p);
171             }
172             break;
173         case 9:
174             {
175             float num1,p;
176             printf("Enter the number you want the cube of: ");
177             scanf("%f",&num1);
178             p=pow(num1,3);
179             printf("The cube of %f is %f",num1,p);
180             }
181             break;
182         case 10:
183             {
184             float num1,s;
185             printf("Enter the number you want the square root of : ");
186             scanf("%f",&num1);
187             s = sqrt(num1);
188             printf("The square root of %f is %f",num1,s);
189             }
190             break;
191         case 11:
192             {
193             float num1, cubeRoot;
194             printf("Enter a number: ");
195             scanf("%f", &num1);
196             cubeRoot = cbrt(num1);
197             printf("The cube root of %.2f is %.2f\n", num1, cubeRoot);
198             }
199             break;
200         case 12:
201             {
202             double angle, result;
203             printf("Enter the angle in degrees: ");
204             scanf("%lf", &angle);
205             double radians = angle * M_PI / 180.0;
206             result = sin(radians);
207             printf("sin(%lf) = %lf\n", angle, result);
208             }
209             break;
210         case 13:
211             {
212             double angle, result;
213             printf("Enter the angle in degrees: ");
214             scanf("%lf", &angle);
215             double radians = angle * M_PI / 180.0;
216             result = cos(radians);
```

```
            printf("cos(%lf) = %lf\n", angle, result);
            }
            break;
        case 14:
            {
            double angle, result;
            printf("Enter the angle in degrees: ");
            scanf("%lf", &angle);
            double radians = angle * M_PI / 180.0;
            result = tan(radians);
            printf("tan(%lf) = %lf\n", angle, result);
            }
            break;
        case 15:
            {
            float x, result;
            printf("Enter a number: ");
            scanf("%f", &x);
            result = log10(x);
            printf("The natural logarithm of %f is %f\n", x, result);
            }
            break;
        case 16:
            {
            float x, result;
            printf("Enter a number: ");
            scanf("%f", &x);
            result = log(x);
            printf("The natural logarithm of %f is %f\n", x, result);
            }
            break;
        case 17:
            {
            double part, total, percentage;
            printf("Enter the part :");
            scanf("%lf",&part);
            printf("Enter the total :");
            scanf("%lf",&total);
            percentage=(part/total)*100;
            printf("The Percentage is : %lf\n",percentage);
            }
            break;
        default:
            printf("Invalid choice. Please try again.\n");
    }
}

void performConversion(int choice) {
    double value;

    switch (choice) {
        case 1:
            printf("\nConversion Menu:\n");
            printf("1. Meters to Feet\n");
            printf("2. Feet to Meters\n");
            printf("3. Inches to Feet\n");
            printf("4. Feet to Inches\n");
            printf("5. Miles to Kilometers\n");
            printf("6. Kilometers to Miles\n");
            printf("7. Yards to Meters\n");
            printf("8. Meters to Yards\n");
            printf("9. Yards to Miles\n");
            printf("10. Miles to Yards\n");
            printf("11. Kilometers to Nautical Miles\n");
            printf("12. Nautical Miles to Kilometers\n");
            printf("13. Nautical Miles to Miles\n");
            printf("14. Miles to Nautical Miles\n");
            printf("\nEnter your choice: ");
            int lengthChoice;
            scanf("%d", &lengthChoice);

            printf("Enter the value to convert: ");
```

```
        scanf("%lf", &value);

        if (lengthChoice == 1) {
            double result = value * 3.281;
            printf("Result: %.5lf feet\n", result);
        } else if (lengthChoice == 2) {
            double result = value / 3.281;
            printf("Result: %.5lf meters\n", result);
        } else if (lengthChoice == 3) {
            double result = value / 12;
            printf("Result: %.5lf feet\n", result);
        } else if (lengthChoice == 4) {
            double result = value * 12;
            printf("Result: %.5lf inches\n", result);
        } else if (lengthChoice == 5) {
            double result = value * 1.60934;
            printf("Result: %.5lf kms\n", result);
        } else if (lengthChoice == 6) {
            double result = value / 1.60934;
            printf("Result: %5lf miles\n", result);
        } else if (lengthChoice == 7) {
            double result = value * 0.9144;
            printf("Result: %.5lf meters\n", result);
        } else if (lengthChoice == 8) {
            double result = value / 0.9144;
            printf("Result: %.5lf yards\n", result);
        } else if (lengthChoice == 9) {
            double result = value / 1760;
            printf("Result: %.5lf miles\n", result);
        } else if (lengthChoice == 10) {
            double result = value * 1760;
            printf("Result: %.5lf yards\n", result);
        } else if (lengthChoice == 11) {
            double result = value / 1.852;
            printf("Result: %.5lf nautical miles\n", result);
        } else if (lengthChoice == 12) {
            double result = value * 1.852;
            printf("Result: %.5lf kms\n", result);
        } else if (lengthChoice == 13) {
            double result = value * 1.15078;
            printf("Result: %.5lf miles\n", result);
        } else if (lengthChoice == 14) {
            double result = value / 1.15078;
            printf("Result: %.5lf nautical miles\n", result);
        } else {
            printf("Invalid choice. Please try again.\n");
        }
        break;

    case 2:
        printf("Weight Conversion Menu:\n");
        printf("1. Kilograms to Pounds\n");
        printf("2. Pounds to Kilograms\n");
        printf("3. Ounces to Grams\n");
        printf("4. Grams to Ounces\n");
        printf("5. Metric Tons to Kilograms\n");
        printf("6. Kilograms to Metric Tons\n");
        printf("7. Short Tons to Kilograms\n");
        printf("8. Kilograms to Short Tons\n");
        printf("9. Long Tons to Kilograms\n");
        printf("10. Kilograms to Long Tons\n");
        printf("11. Stones to Kilograms\n");
        printf("12. Kilograms to Stones\n");
        printf("13. Carats to Grams\n");
        printf("14. Grams to Carats\n");
        printf("\nEnter your choice: ");
        int weightChoice;
        scanf("%d", &weightChoice);

        printf("Enter the value to convert: ");
        scanf("%lf", &value);
```

```
            if (weightChoice == 1) {
                double result = value * 2.205;
                printf("Result: %.5lf pounds\n", result);
            } else if (weightChoice == 2) {
                double result = value / 2.205;
                printf("Result: %.5lf kgs\n", result);
            } else if (weightChoice == 3) {
                double result = value * 28.34;
                printf("Result: %.5lf grams\n", result);
            } else if (weightChoice == 4) {
                double result = value / 28.34;
                printf("Result: %.5lf ounces\n", result);
            } else if (weightChoice == 5) {
                double result = value * 1000;
                printf("Result: %.5lf kgs\n", result);
            } else if (weightChoice == 6) {
                double result = value / 1000;
                printf("Result: %.5lf metric tons\n", result);
            } else if (weightChoice == 7) {
                double result = value * 907.185;
                printf("Result: %.5lf kgs\n", result);
            } else if (weightChoice == 8) {
                double result = value / 907.185;
                printf("Result: %.5lf short tons\n", result);
            } else if (weightChoice == 9) {
                double result = value * 1016.05;
                printf("Result: %.5lf kgs\n", result);
            } else if (weightChoice == 10) {
                double result = value / 1016.05;
                printf("Result: %.5lf long tons\n", result);
            } else if (weightChoice == 11) {
                double result = value * 6.35029;
                printf("Result: %.5lf kgs\n", result);
            } else if (weightChoice == 12) {
                double result = value / 6.35029;
                printf("Result: %.5lf stones\n", result);
            } else if (weightChoice == 13) {
                double result = value * 0.2;
                printf("Result: %.5lf grams\n", result);
            } else if (weightChoice == 14) {
                double result = value / 0.2;
                printf("Result: %.5lf carats\n", result);
            } else {
                printf("Invalid choice. Please try again.\n");
            }
            break;

        default:
            printf("Invalid choice. Please try again.\n");
    }
}
```

9. Output :

```
      Personal Calculator and Converter

Enter your Username:
```

```
      Personal Calculator and Converter

Enter your Username: Subhasish
Enter your Password: password
Login successful! Welcome, Subhasish

         Main Menu:

1. Calculator
2. Converter
3. Exit

Enter your choice:
```

```
      Personal Calculator and Converter

Enter your Username: Subhasish
Enter your Password: password
Login successful! Welcome, Subhasish

         Main Menu:

1. Calculator
2. Converter
3. Exit

Enter your choice: 1

Calculator Menu:
1. Addition
2. Subtraction
3. Multiplication
4. Division
5. Modulus
6. Power
7. Factorial
8. Square
9. Cube
10. Squareroot
11. Cuberoot
12. Sin()
13. Cos()
14. Tan()
15. Log
16. Ln
17. Percentage

Enter your choice:
```