UNIT CONVERTER

A

Mini Project Report

Submitted in partial fulfilment of the

Requirements for the award of the Degree of

BACHELOR OF ENGINEERING

IN

INFORMATION TECHNOLOGY

By

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DECLARATION BY THE CANDIDATE

We, GANESH POTLAPALLY and GURRAM PRASANNA TEJA, bearing hall ticket numbers, 1602-19-737-131 and 1602-19-737-146, hereby declare that the project report entitled "UNIT CONVERTER" is submitted in partial fulfilment of the requirement for the award of the degree of Bachelor of Engineering in Information Technology.

This is a record of bonafide work carried out by us and the results embodied in this project report have not been submitted to any other university or institute for the award of any other degree or diploma.

GANESH POTLAPALLY

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ACKNOWLEDGEMENT

I am heartily thankful to Ms. Divya Lingineni, Assistant Professor, Department of Information Technology, Vasavi College of Engineering for supporting and encouraging us and also thankful to our college, Vasavi College of Engineering for providing the opportunity to implement our “Unit Converter” Mini Project.

sincerely,

Ganesh Potlapally 1602-19-737-131

Gurram Prasanna Teja 1602-19-737-146

ABSTRACT

Our aim is to convert the number given by the user from given number system to other number systems(i.e from binary to octal,etc.)and also other basic conversions. It also gives the one's and two's complement of the binary number given by the user. This project also includes some of the basic conversions like

• Temperature

• Mass

• Distance

• Speed,etc.

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1. INTRODUCTION

About the Project

"Unit Converter" is a console based C Project which helps the user to convert the units of physical quantities to another equivalent unit easily and accurately. This Project also includes the engineering conversions like decimal number to binary number etc. and one's and two's complement of the given binary can be determined using this Mini Project.

Features

Our vision is to help the user to convert the units of the physical quantities from one unit to other units without any errors. The features of this Project are,

- **Basic Conversions**
    1. **Mass**
    2. **Length**
    3. **Volume**
- **One's and Two's Complement**
- **Currency Conversions**
- **Temperature**
- **Number System Conversions**

2. TECHNOLOGY

SOFTWARE REQUIREMENTS

- Operating System (Windows 7 and above)
- GCC Compiler
- Any text editor

HARDWARE REQUIREMENTS

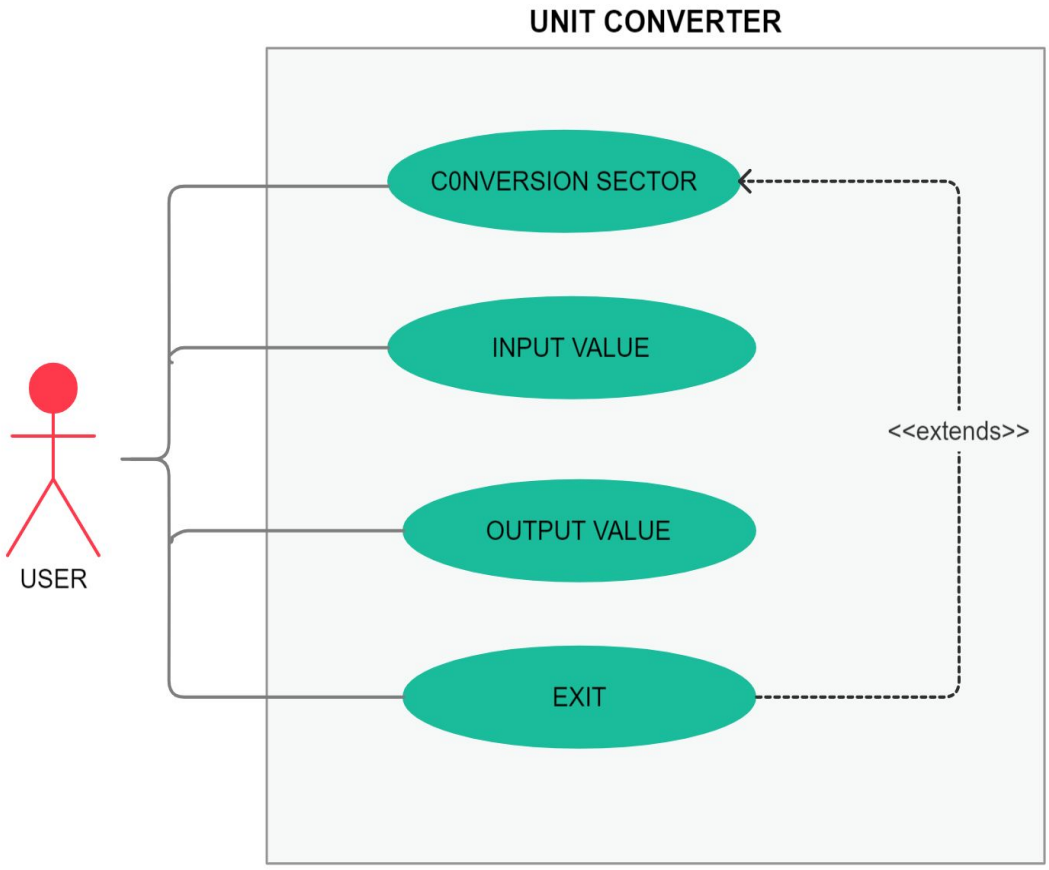
- Processor : Intel Core i3 and above
- Memory : 4GB RAM

3. PROPOSED WORK

a. Design

i. Use case diagram

The person who uses this “Unit Converter” will have access to convert from one unit to other units from the list given in the program.



b. Implementation

i. Code

```
#include<stdio.h>
#include<stdlib.h>
#include<ctype.h>
#include<math.h>
#include<string.h>
#define pi 3.14
void common_conversion();
void complements();
void temperature();
void currency_conversion();
int ConvertOctaltoDecimal(int);
int ConvertHexatoDecimal(char *);
long ConvertDecimalToBinary(int);
long ConvertBinaryToHexOct(int);
void sytem_conversion();
int main()
{
	system("cls");
	char choice;
	int ele=0;
	printf("	UnitConversion Program\n");
	printf("**************************************\n\n");
	printf("    ********************************    \n\n");
	printf("        ********************        \n\n");
	printf("            ***********             \n\n");
	printf("              *******              \n\n");
	printf("                **                \n\n");
	printf("****Please enter your choice (a-f):*****\n\n");
	while(choice!='f')
	{
		printf("\na:Basic Conversions\nb:Complements\nc:Physics
Conversions\nd:Currency Conversions\ne:System Conversions\nf:Exit program\n\n");
		fflush(stdin);
		scanf("%c",&choice);
		switch(choice)
```

```
		{
			case 'a':{
				common_conversion();
				break;
			}
			case 'b':
				complements();
				break;
			case 'c':
				temperature();
				break;
			case 'd':
			{
				currency_conversion();
				break;
			}
			case 'e':
				sytem_conversion();
				break;
			case 'f':
				break;
			default:
				printf("Please e valid  Choice\n");
		}
	}
	printf("**   THE END   ***");
	return 0;
}
```

//converting decimal number to binary number

```
long ConvertDecimalToBinary(int deci){
	int rem=0,temp=1,binarynum=0;

	while(deci!=0) {
		rem=deci%2;
		binarynum=binarynum+rem*temp;
		deci=deci/2;
		temp=temp*10;
```

```
        }

        return(binarynum);
}
//converting hexadecimal number to decimal number
int ConvertHexatoDecimal(char *hexa) {
        int dec=0,i=0,j,len,num;
        len=strlen(hexa);
        for(j=0;j<len;j++)
                hexa[j]=toupper(hexa[j]);
        while(len>0) {
                if(hexa[i]>='A'&&hexa[i]<='F') {
                        num=hexa[i]-'A'+10;
                        dec=dec+(num*pow(16,(len-1)));
                        }
                else {
                        num=hexa[i]-'0';
                        dec=dec+(num*pow(16,(len-1)));
                        }
                i++;
                len--;
                }
        return(dec);
}
//converting octal number to decimal number
int ConvertOctaltoDecimal(int octal) {
        int deci=0,temp,i,num=0;
        temp=octal;
        while(temp!=0) {
                i=temp%10;
                deci=deci+(i*pow(8,num));
                temp=temp/10;
                num++;
                }

        return(deci);
}
```

```
//converting binary number to hexadecimal and octal numbers
long ConvertBinaryToHexOct(int binary)
{

	int oct,number,j,rem,hexa;

	printf("enter the number To Convert 1:hexadecimal\n2:Octal number");
	scanf("%d",&number);
	if(number==1){
		while(binary!=0){
			rem=binary%10;
			hexa=hexa+rem*j;
			j=j*2;
			binary=binary/10;
		}

		printf(" hexadecimal value: %lX",hexa);
		return hexa;
	}
	else if(number==2){
		while(binary!=0){
			rem=binary%10;
			oct=oct+rem*j;
			j=j*2;
			binary=binary/10;
		}
		return oct;
	}
	else
		return 1;
}

void common_conversion(){
	printf("\n\n***Please enter your choice in Common Convertion:**\n\n");
	int element=0;
	char option;
	while(element!=4)
```

```
	{
		printf("\n1:Mass Convertion\n2:Length Convertion\n3:Volume Convertion\n4:exit Convertion");
		printf("\nEnter your choice : ");
		scanf("%d",&element);
		fflush(stdin);
		switch(element)
		{
			case 1:
			{
				char WeightConversion='0';
				while(WeightConversion!='E'){
					printf("\n\nA)grams to kilograms\tB)milligrams to kilograms\tC)pounds to kilograms\tD)kilograms to pounds\tE)Exit weightconversion\n\n");
					printf("Enter your choice : ");
					fflush(stdin);
					scanf("%c",&WeightConversion);
					fflush(stdin);
					switch(WeightConversion)
					{
						case 'A':{
							do{
								float gm;
								printf("Enter Weight (in grams) : ");
								scanf("%f",&gm);

printf("%.4fgm=%.4fkg\n",gm,(gm*(0.001)));
								printf("Enter E to Exit Conversion of Grams to KiloGrams : ");
								fflush(stdin);
								scanf("%c",&option);
							}while(option!='E');
							break;
						}
						case 'B': {
							do{
```

```
                                        float mg;
                                        printf("Enter weight (in
milligrams) : ");
                                        scanf("%f",&mg);

printf("%.4fmg=%.4fkg\n",mg,(mg*(0.00001)));
                                        printf("Enter E to Exit
Conversion of Grams to Milligrams : ");
                                        fflush(stdin);
                                        scanf("%c",&option);
                                }while(option!='E');
                                break;
                        }
                        case 'C':{
                                do{
                                        float pound;
                                        printf("Enter weight (in
pounds) : ");
                                        scanf("%f",&pound);

printf("%.4fpound=%.4fkg\n",pound,(pound*0.454));
                                        printf("Enter E to Exit
Conversion of Pounds to KiloGrams : ");
                                        fflush(stdin);
                                        scanf("%c",&option);
                                }while(option!='E');
                                break;
                        }

                        case 'D': {
                                do{
                                        float kg;
                                        printf("Enter weight in kgs\n");
                                        scanf("%f",&kg);

printf("%.4fkg=%.4fpounds\n",kg,(kg/0.454));
```

```
                                                printf("conversion in kilograms
ended E to exit \n");
                                                fflush(stdin);
                                                scanf("%c",&option);
                                        }while(option!='E');
                                        break;
                                }
                                case 'E':
                                        printf("Mass conversion is  exited\n");
                                        break;
                                default:
                                        printf("\nInvalid Option\nTry
again\n");
                                }
                        }
                        break;
                }
                case 2:{
                        char lengthConversion='0';
                        fflush(stdin);
                        while(lengthConversion!='E'){
                                printf("\n\nA)meters to centimetres\tB)centimetres to
kilometers\tC)kilometers to metres\tD)metres to kilometres\tE:EXIT
lengthConversion\n\n");
                                printf("Enter your choice : ");
                                fflush(stdin);
                                scanf("%c",&lengthConversion);
                                fflush(stdin);
                                switch(lengthConversion)
                                {
                                        case 'A':{
                                                do{
                                                        float m;
                                                        printf("Enter meters\n");
                                                        scanf("%f",&m);

printf("%.4fm=%.4fcm\n",m,(m*100));
```

```
                                        printf("conversion in
centimeters ended E to exit \n ");
                                        fflush(stdin);
                                        scanf("%c",&option);
                                }while(option!='E');
                                break;
                        }
                        case 'B': {
                                do{
                                float cm;
                                        printf("Enter Centi meters\n");
                                        scanf("%f",&cm);

printf("%.4fcm=%.4fkm\n",cm,(cm/1000));
                                        printf("conversion in
centimeters ended E to exit \n");
                                        fflush(stdin);
                                        scanf("%c",&option);
                                }while(option!='E');
                                break;
                        }
                        case 'C': {
                                do{
                                        float km;
                                        printf("Enter Kilo meters\n");
                                        scanf("%f",&km);

printf("%.4fkm=%.4fm\n",km,(km*1000));
                                        printf("conversion in
kilometers ended E to exit\n");
                                        fflush(stdin);
                                        scanf("%c",&option);
                                }while(option!='E');
                                break;
                        }
                        case 'D': {
                                do{
```

```
                                                float m;
                                                printf("Enter a value  (in
meters) : ");
                                                scanf("%f",&m);

printf("%.4fm=%.4fkm\n",m,(m*0.001));
                                                printf("conversion in meters
ended  E to exit\n");
                                                fflush(stdin);
                                                scanf("%c",&option);
                                        }while(option!='E');
                                        break;
                                }
                                case 'E':
                                        printf("Exiting Length Conversion");
                                        break;
                                default:
                                {
                                        printf("InValid Meter Conversion\n
Try Again>>>\n");
                                }
                        }
                }
                break;
        }
        case 3:
        {
                int volumeconverstion=0;
                while(volumeconverstion!='E'){

printf("\n\nA)cube\tB)cone\tC)sphere\tD)cyclinder\tE)Exit\n\n");
                        printf("Enter your choice : ");
                        fflush(stdin);
                        scanf("%c",&volumeconverstion);
                        fflush(stdin);
                        switch(volumeconverstion)
                        {
```

```
case 'A':{
        do{
                float m;
                printf("Enter the (side) of cube
: ");

                scanf("%f",&m);
                printf("\nvolume of cube %.4f
= %.4fcubicmetres\n",m,(m*m*m));

                printf("conversion in volume
cube is ended E to exit \n");

                fflush(stdin);
                scanf("%c",&option);
        }while(option!='E');
        break;
}
case 'B':{
        do{
                float r,h;
                printf("\nEnter (height and
radius) of cone : ");

                scanf("%f%f",&h,&r);
                printf("volume of cone is
%.4fcubic metres\n",(pi*r*r*(h/3)));

                printf("conversion in volume
cone is ended E to exit \n");

                fflush(stdin);
                scanf("%c",&option);
        }while(option!='E');
        break;
}
case 'C': {
        do{
                float r;
                printf("Enter (radus) of sphere :
");

                scanf("%f",&r);
```

```
                                        printf("\nvolme of sphere
%.4fm\n",(4/3)*pi*r*r*r);
                                        fflush(stdin);
                                        scanf("%c",&option);
                                    }while(option!='E');
                                    break;
                                }
                                case 'D': {
                                    do{
                                        float h,r;
                                        printf("Enter (height and
radius) of cyclinder : ");
                                        scanf("%f%f",&h,&r);
                                        printf("\nvolume of cyclinder:
%.4fcubic meters\n",pi*r*r*h);
                                        printf("conversion in volume
cyclinder  is ended E to exit \n ");
                                        fflush(stdin);
                                        scanf("%c",&option);
                                    }while(option!='E');
                                    break;
                                }
                                case 'E':
                                    printf("Exiting Volume Conversion");
                                    break;
                                default:
                                {
                                    printf("InValid volume Conversion
Choice\n");
                                }
                            }

                        }
                        break;
                        case 4:
                            printf("Closing the program.....");
                            break;
```

```
                default:
                {
                        printf("InValid Choice\nTry Again....\n");
                }
            }
        }
    }

void currency_conversion(){
    int currencyconvertor=0;
    while(currencyconvertor!=5)
    {
        printf("\n\n1:rupees to Dollar\n2:Dollars to rupees\n3:rupees to
Euros\n4:Euros to rupees\n5:Exit currency_conversion\n\n");
        scanf("%d",&currencyconvertor);
        switch(currencyconvertor)
        {
            case 1:
            {
                float rupe,dollar;
                printf("Enter Amount (in rupes) : ");
                scanf("%f",&rupe);
                dollar=(rupe*0.0149);
                printf("\n%.2f InidanRupees=%f $\n",rupe,dollar);
                break;
            }
            case 2:
            {
                float rupe,dollar;
                printf("Enter Amount (in Dollars): ");
                scanf("%f",&dollar);
                rupe=(dollar*67.06);
                printf("\n%.2f $=%f InidanRupees\n",dollar,rupe);
                break;
            }
            case 3:
```

```
                        {
                                float rupe,euro;
                                printf("Enter Amount (in rupes) : ");
                                scanf("%f",&rupe);
                                euro=(float)(rupe*0.0141);
                                printf("\n%.2f InidanRupees=%f EUR\n",rupe,euro);
                                break;
                        }
                        case 4:
                        {
                                float rupe,euro;
                                        printf("Enter Amount (in Euro) : ");
                                scanf("%f",&euro);
                                rupe=(float)(euro*71.1574);
                                printf("\n%.2f EUR=%f InidanRupees\n",euro,rupe);
                                break;
                        }
                        default:
                        {
                                printf("Please enter valid Currency Choice\n");
                        }
                }
        }
}
void sytem_conversion(){
        int ele=0;
        int deci,binary;
        char hexa[20];
        int hexoct;
        int octal,decimal;
        while(ele!=5)
        {
                printf("\n1:
decimaltobinary\n2:hexatodecimal\n3:binarytohexaoct\t4:octatodeci\t5)exit");
                printf("\nSelect an option : ");
                scanf("%d",&ele);
                switch(ele)
```

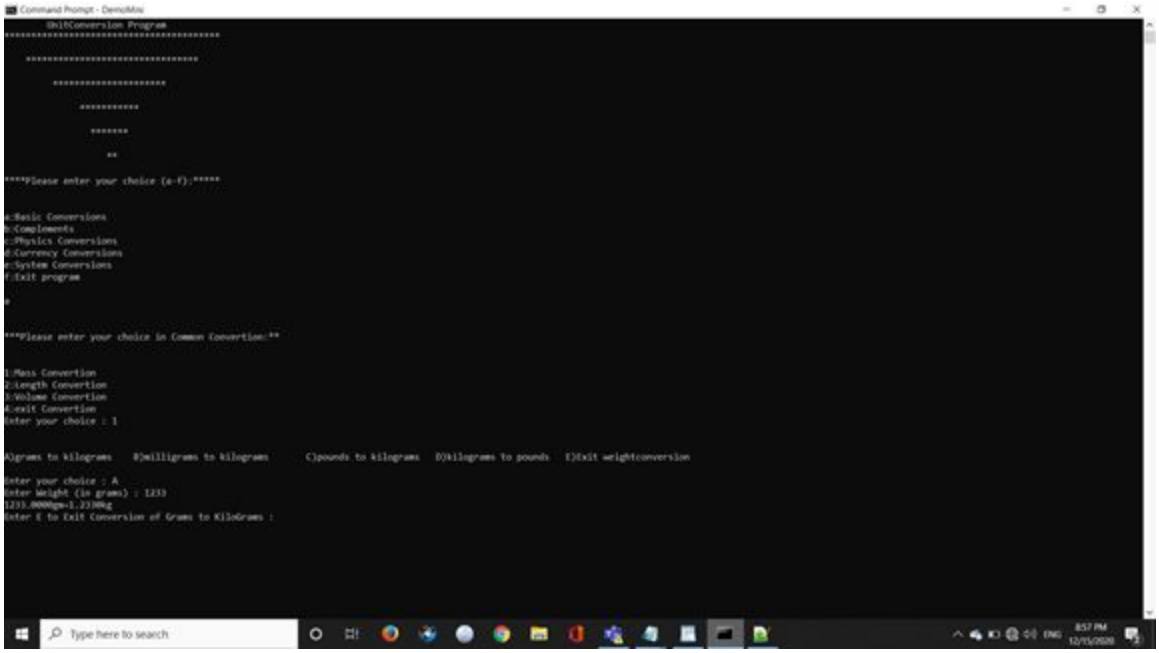
```
                {
                        case 1:
                                printf("enter the decimal number : ");
                                scanf("%d",&deci);
                                binary=ConvertDecimalToBinary(deci);
                                printf("Decimal for Binary %d :%d\n",deci,binary);
                                break;
                        case 2:
                                printf("enter the hexadecimal number : ");
                                scanf("%s",hexa);
                                deci=ConvertHexatoDecimal(hexa);
                                printf("Decimal for HexaDecimal %s :%d\n",hexa,deci);
                                break;
                        case 3:
                                printf("enter the binary number : ");
                                scanf("%d",&binary);
                                hexoct=ConvertBinaryToHexOct(binary);
                                printf(" \nBinary to hexoct%d :%c\n",binary,hexoct);
                                printf("\nBinary to hexoct ended \n ");
                                break;
                        case 4:
                                printf("Enter the Octal Number not exceed 8 : ");
                                scanf("%d",&octal);
                                decimal=ConvertOctaltoDecimal(octal);
                                printf("Binary Number Octal Number %d :
%d\n",octal,decimal);
                                printf("\noctal to binary is ended \n ");
                                break;
                        default:
                                printf("\nInvalid Option\nTry Again...\n");
                }
        }
}
void complements()
#define n 100
{
char binary[n],onescomplement[n],twoscomplement[n];
```

```
    int con,e=1;
    printf("Enter the binary number : ");
    scanf("%s",binary);
    for(con=0; con<n; con++)
    {
       if(binary[con] == '1')
       {
          onescomplement[con] = '0';
       }
       else if(binary[con] == '0')
       {
          onescomplement[con] = '1';
       }
    }
    for(con=n-1; con>=0; con--)
    {
       if(onescomplement[con] == '1' && e == 1)
       {
          twoscomplement[con] = '0';
       }
       else if(onescomplement[con] == '0' && e == 1)
       {
          twoscomplement[con] = '1';
          e = 0;
       }
       if((onescomplement[con]=='1' && e==0) || (onescomplement[con]=='0' && e==0))
       {
          twoscomplement[con] = onescomplement[con];
       }
    }
    printf("Given Binary number : %s\n",binary);
    printf("One's complement is %s\n",onescomplement);
    printf("Twos complement = %s\n",twoscomplement);
}
void temperature()
{
    int val=0;
```

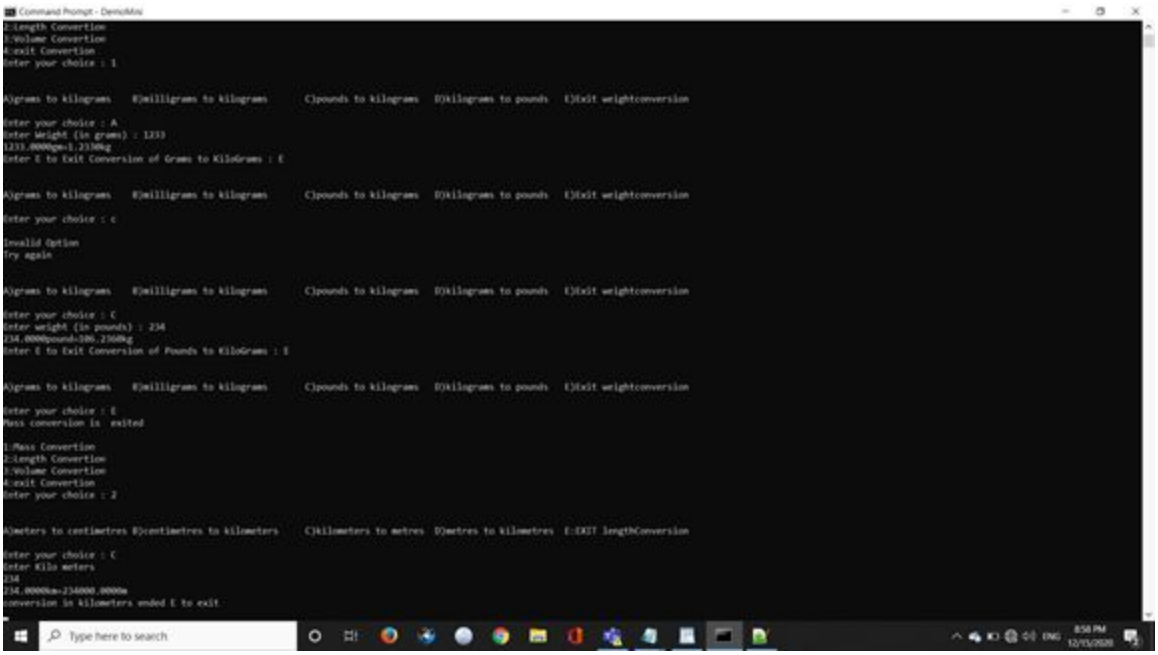
```
    float celsius,kelvin,fahrenheit;
        while(val!=5){
                printf("1. temperature to Fahrenheit\n2.Fahrenheit to
temperature\n3.temperature to Kelvin\n4.Kelvin to temperature5:Exit\n");
                printf("Select an option\n\n");
                scanf("%d",&val);
                switch(val)
                {
                        case 1:
                                printf("Enter temperature (in Celsius): ");
                                scanf("%f", &celsius);
                                fahrenheit = (celsius * 9/5) + 32;
                                printf("%f °C = %.2f F\n", celsius, fahrenheit);
                                break;
                        case 2:
                                printf("Enter temperature (in Fahrenheit): ");
                                scanf("%f",&fahrenheit);
                                celsius=(fahrenheit-32)*5/9;
                                printf("%.2f F = %f °C\n",fahrenheit,celsius);
                                break;
                        case 3:
                                printf("Enter temperature (in Celsius): ");
                                scanf("%f",&celsius);
                                kelvin=celsius+273.15;
                                printf("%f °C = %.2f K\n",celsius,kelvin);
                                break;
                        case 4:
                                printf("Enter temperature (in Kelvin) : ");
                                scanf("%f",&kelvin);
                                celsius= kelvin-273.15;
                                printf("%.2f K = %.2f °C\n",kelvin,celsius);
                                break;
                }
        }
}
```

4. RESULTS

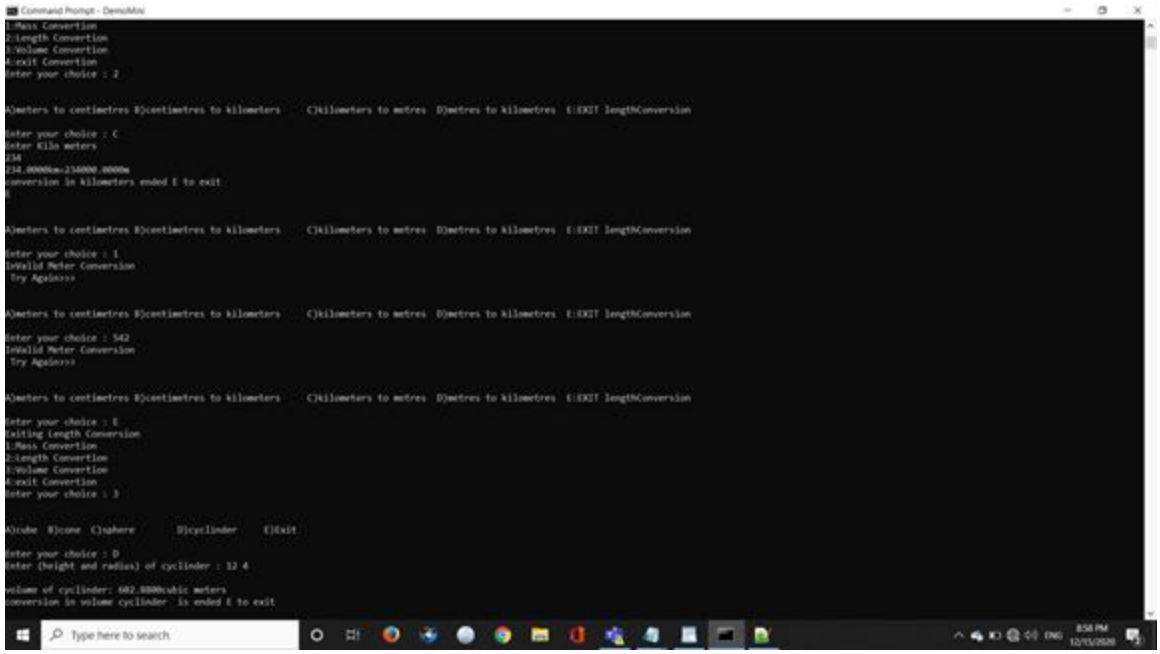
Test Case 1:



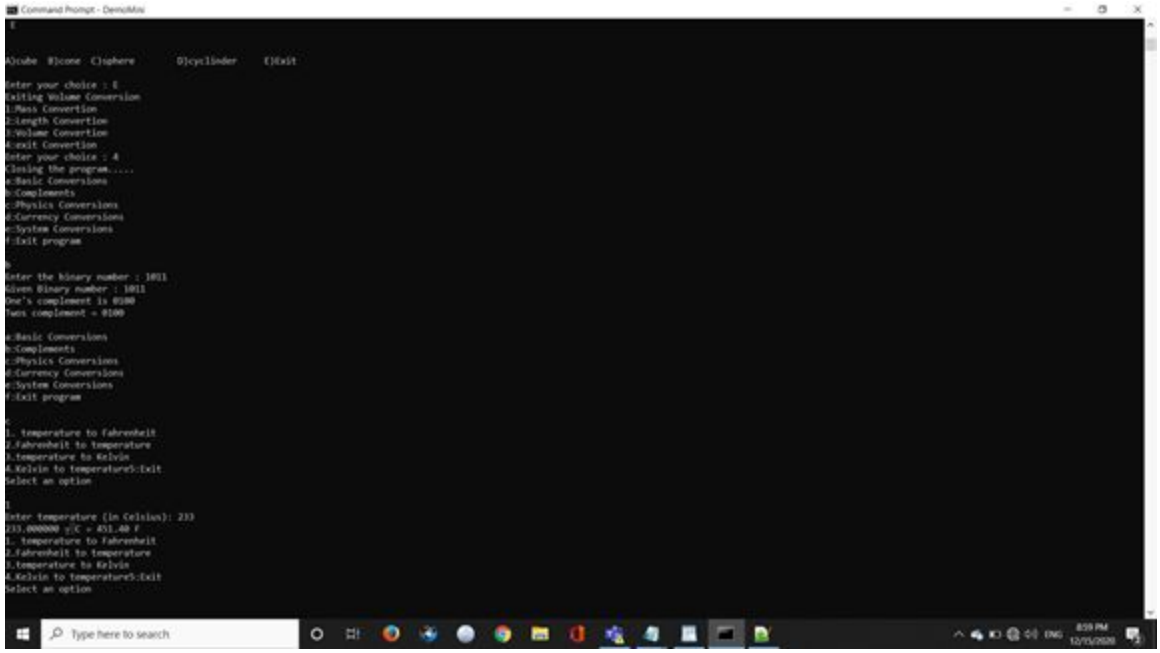
Test Case 2:



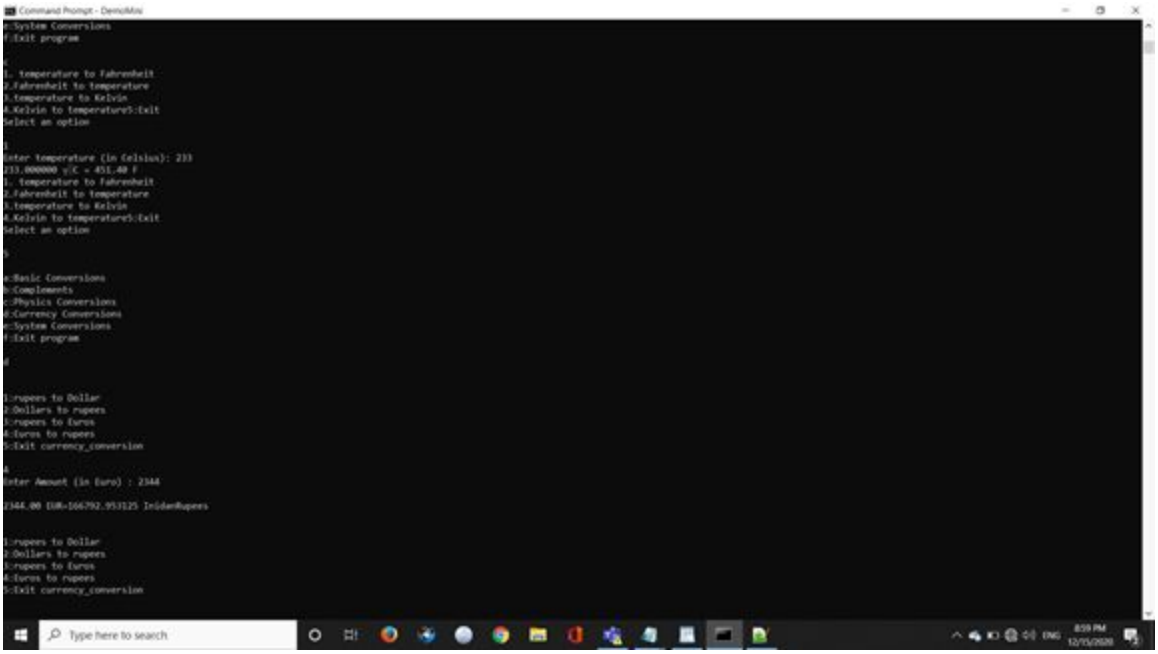
Test Case 3:



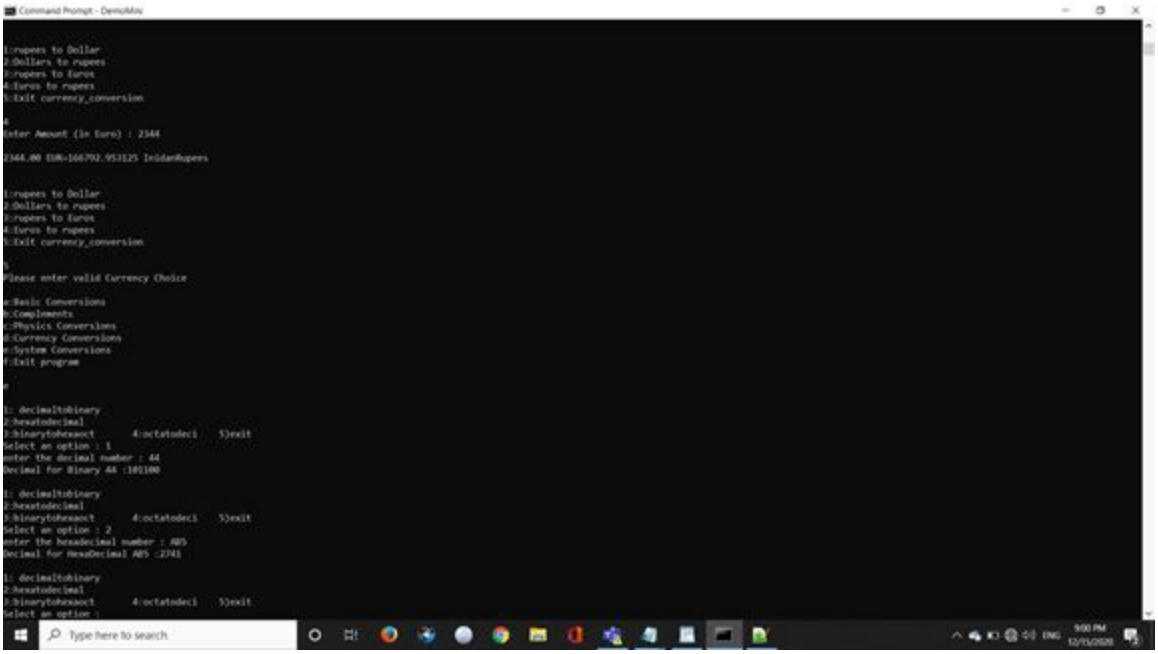
Test Case 4:



Test Case 5:



Test Case 6:



5. CONCLUSION AND FUTURE WORK

To conclude, we have made this project in which users can easily solve the conversions from one unit to other units in various measurements like mass, temperature, currency, etc. It also provides the facility to convert the units of physical quantities to another equivalent unit easily and accurately without any errors. In future this project can be further improved by converting it into an application.

6. REFERENCES

1. C language - cppreference : https://en.cppreference.com/w/c/language
2. C language documentation : https://docs.microsoft.com/en-us/cpp/c-language/c-language-reference?view=msvc-160