1.Write a c program to count the number of digits in a number:

#include <stdio.h>

int main() {

long int n;

int count = 0;

printf("Enter an integer: ");

scanf("%ld", &n);

while (n != 0) {

n =n/10;

count++;

}

printf("Number of digits: %d", count);

return 0;

}

2. C program to swap the first and last digits of a number:

#include <stdio.h>

#include <math.h>

int main {

int Number, FirstDigit, DigitsCount, LastDigit, a, b, SwapNum,temp;

printf("Enter any number:");

scanf("%d",&Number);

DigitsCount = log10(Number);

FirstDigit = Number / pow(10, DigitsCount);

LastDigit = Number % 10;

a = FirstDigit \* (pow(10, DigitsCount));

b = Number % a;

Number = b / 10;

SwapNum = LastDigit \* (pow(10, DigitsCount)) + (Number \* 10 + FirstDigit);

printf(" \n The Number after Swapping First Digit and Last Digit = %d", SwapNum);

return 0;

}

3. C program to find the frequency of each digit in a number:

#include <stdio.h>

#define BASE 10

int main()

{

long int num, n;

int i, lastDigit;

int freq[BASE];

printf("Enter any number: ");

scanf("%ld", &num);

for(i=0; i<BASE; i++)

{

freq[i] = 0;

}

n = num;

while(n != 0)

{

lastDigit = n % 10;

n /= 10;

freq[lastDigit]++;

}

printf("Frequency of each digit in %lld is: \n", num);

for(i=0; i<BASE; i++)

{

printf("Frequency of %d = %d\n", i, freq[i]);

}

return 0;

}

4. C program to enter a number and print it in words:

#include <stdio.h>

int main()

{

long int n, num = 0;

printf("Enter any number: ");

scanf("%ld", &n);

while(n != 0)

{

num = (num \* 10) + (n % 10);

n /= 10;

}

while(num != 0)

{

switch(num % 10)

{

case 0:

printf("Zero ");

break;

case 1:

printf("One ");

break;

case 2:

printf("Two ");

break;

case 3:

printf("Three ");

break;

case 4:

printf("Four ");

break;

case 5:

printf("Five ");

break;

case 6:

printf("Six ");

break;

case 7:

printf("Seven ");

break;

case 8:

printf("Eight ");

break;

case 9:

printf("Nine ");

break;

}

num = num / 10;

}

return 0;

}

5. C program to print all the ascii values of the characters:

#include <stdio.h>

int main() {

char c;

printf("Enter a character: ");

scanf("%c", &c);

printf("ASCII value of %c = %d", c, c);

return 0;

}

6.Program to find one’s compliment of a binary number:

#include<stdio.h>

#include<stdlib.h>

#define SIZE 8

int main()

{

int i, bit\_size;

char num[SIZE + 1], one\_comp[SIZE + 1];

printf("Enter the binary number:\n");

gets(num);

for(i = 0; i < SIZE; i++)

{

if(num[i] == '0'){

one\_comp[i] = '1';

}

else if(num[i] == '1') {

one\_comp[i] = '0';

}}

one\_comp[SIZE] = '\0';

printf("Ones' complement of binary number %s is %s\n",num, one\_comp);

return 0;

}

7. Program to find both one’s compliment and two’s compliment of a binary number:

#include <stdio.h>

#define SIZE 8

int main()

{

char binary[SIZE + 1], onesComp[SIZE + 1], twosComp[SIZE + 1];

int i, carry=1;

printf("Enter binary value: ");

gets(binary);

for(i=0; i<SIZE; i++)

{

if(binary[i] == '1')

{

onesComp[i] = '0';

}

else if(binary[i] == '0')

{

onesComp[i] = '1';

}}

onesComp[SIZE] = '\0';

for(i=SIZE-1; i>=0; i--)

{

if(onesComp[i] == '1' && carry == 1)

{

twosComp[i] = '0';}

else if(onesComp[i] == '0' && carry == 1)

{

twosComp[i] = '1';

carry = 0;}

else

{

twosComp[i] = onesComp[i];

}}

twosComp[SIZE] = '\0';

printf("Original binary = %s\n", binary);

printf("Ones complement = %s\n", onesComp);

printf("Twos complement = %s\n", twosComp);

return 0;

}

8. Binary to octal number system:

#include <stdio.h>

int main()

{

long int binarynum, octalnum = 0, j = 1, remainder;

printf("Enter the binary number: ");

scanf("%ld", &binarynum);

while (binarynum != 0)

{

remainder = binarynum % 10;

octalnum = octalnum + remainder \* j;

j = j \* 2;

binarynum = binarynum / 10; }

printf("Equivalent octal value: %lo", octalnum);

return 0;

}

9.Binary to decimal number system:

#include <stdio.h>

int main()

{

long int binarynum, j = 1, remainder,octalnum=0;

printf("Enter the binary number: ");

scanf("%ld", &binarynum);

while (binarynum != 0)

{

remainder = binarynum % 10;

octalnum = octalnum + remainder \* j;

j = j \* 2;

binarynum = binarynum / 10;

}

printf("Octal value: %lo", octalnum);

return 0;

}

10.Binary to hexadecimal number system:

#include<stdio.h>

#include<conio.h>

void main()

{

long int binary\_number, hexadecimal\_number = 0, i = 1, remainder;

printf("Enter any Binary Number: ");

scanf("%ld", &binary\_number);

while (binary\_number != 0)

{

remainder = binary\_number % 10;

hexadecimal\_number = hexadecimal\_number + remainder \* i;

i = i \* 2;

binary\_number = binary\_number / 10;

}

printf("Hexadecimal Number:%lX", hexadecimal\_number);

getch();

return 0;

}

11.Octal to Binary number system:

#include <stdio.h>

#include <math.h>

void main()

{

long int n1,temp,p=1,dec=0,i=1,j,d,binnum=0;

printf("Input an octal number:");

scanf("%ld",&n1);

temp=n1;

for (j=n1;j>0;j=j/10)

{

d = j % 10;

if(i==1)

p=p\*1;

else

p=p\*8;

dec=dec+(d\*p);

i++; }

i=1;

for(j=dec;j>0;j=j/2)

{

binnum=binnum+(dec % 2)\*i;

i=i\*10;

dec=dec/2; }

printf("\nThe Octal Number :%ld \nBinary number:%ld",temp,binnum);

return 0;

}

12.Octal to decimal number system:

include <stdio.h>

#include <math.h>

long octalToDecimal(int octalnum)

{

int decimalnum = 0, temp = 0;

while(octalnum != 0)

{

decimalnum = decimalnum + (octalnum%10) \* pow(8,temp);

temp++;

octalnum = octalnum / 10;}

return decimalnum;}

int main()

{

int octalnum;

printf("Enter an octal number: ");

scanf("%d", &octalnum);

printf("Decimal number:%ld", octalToDecimal(octalnum));

return 0;

}

13.Octal to Hexadecimal number system:

#include<stdio.h>

#include<conio.h>

#include<string.h>

int main()

{

int octnum, rev=0, rem, count=0, hex=0, mul=1, i=0, k=0;

char binnum[40] = "", hexnum[40];

printf("Enter any Octal Number: ");

scanf("%d", &octnum);

while(octnum!=0)

{

rem = octnum%10;

if(rem>7)

{

count++;

break;

}

rev = (rev\*10) + rem;

octnum = octnum/10;

}

if(count==0)

{

octnum = rev;

while(octnum!=0)

{

rem = octnum%10;

switch(rem)

{

case 0: strcat(binnum, "000");

break;

case 1: strcat(binnum, "001");

break;

case 2: strcat(binnum, "010");

break;

case 3: strcat(binnum, "011");

break;

case 4: strcat(binnum, "100");

break;

case 5: strcat(binnum, "101");

break;

case 6: strcat(binnum, "110");

break;

case 7: strcat(binnum, "111");

break;

}

octnum = octnum/10;

}

while(binnum[k]!='\0')

k++;

count=1;

k--;

while(k>=0)

{

if(binnum[k]=='0')

rem = 0;

else

rem = 1;

hex = hex + (rem\*mul);

if(count%4==0)

{

if(hex<10)

hexnum[i] = hex+48;

else

hexnum[i] = hex+55;

mul = 1;

hex = 0;

count = 1;

i++;

}

else

{

mul = mul\*2;

count++;

}

k--;

}

if(count!=1)

hexnum[i] = hex+48;

if(count==1)

i--;

printf("\nEquivalent Hexadecimal Value = ");

count = 0;

for(i=i; i>=0; i--)

{

if(hexnum[i]=='0' && count==0)

{

count++;

continue;

}

else

printf("%c", hexnum[i]);

}

}

else

printf("\nInvalid Octal Digit %d", rem);

getch();

return 0;

}

14.Decimal to binary number system:

#include <stdio.h>

int main()

{

int number, n, remainder, binary = 0, place = 1;

printf("Enter a number :");

scanf("%d", &number);

n = number;

while (n > 0)

{

remainder = n % 2;

binary += remainder \* place;

place \*= 10;

n /= 2; }

printf("Binary equivalent:%d",binary);

return 0;

}

15.Decimal to octal number sytem:

#include <stdio.h>

#include <math.h>

int decimalToOctal(int decimalnum)

{

int octalnum = 0, temp = 1;

while (decimalnum != 0)

{

octalnum = octalnum + (decimalnum % 8) \* temp;

decimalnum = decimalnum / 8;

temp = temp \* 10;

}

return octalnum;

}

int main()

{

int decimalnum;

printf("Enter a Decimal Number: ");

scanf("%d", &decimalnum);

printf("Equivalent Octal Number: %d", decimalToOctal(decimalnum));

return 0;

}

16.Decimal to Hexadecimal number system:

#include<stdio.h>

int main() {

long int decimalNumber,remainder,quotient;

int i=1,j,temp;

char hexadecimalNumber[100];

printf("Enter any decimal number: ");

scanf("%ld",&decimalNumber);

quotient = decimalNumber;

while(quotient!=0) {

temp = quotient % 16;

if( temp < 10)

temp =temp + 48; else

temp = temp + 55;

hexadecimalNumber[i++]= temp;

quotient = quotient / 16;

}

printf("Equivalent hexadecimal value : ");

for (j = i -1 ;j> 0;j--)

printf("%c",hexadecimalNumber[j]);

return 0; }

17.Hexadecimal to binary number system:

#include <stdio.h>

#include <string.h>

int main()

{

char hex[17], bin[65] = "";

int i = 0;

printf("Enter any hexadecimal number: ");

gets(hex);

for(i=0; hex[i]!='\0'; i++)

{

switch(hex[i])

{

case '0':

strcat(bin, "0000");

break;

case '1':

strcat(bin, "0001");

break;

case '2':

strcat(bin, "0010");

break;

case '3':

strcat(bin, "0011");

break;

case '4':

strcat(bin, "0100");

break;

case '5':

strcat(bin, "0101");

break;

case '6':

strcat(bin, "0110");

break;

case '7':

strcat(bin, "0111");

break;

case '8':

strcat(bin, "1000");

break;

case '9':

strcat(bin, "1001");

break;

case 'a':

case 'A':

strcat(bin, "1010");

break;

case 'b':

case 'B':

strcat(bin, "1011");

break;

case 'c':

case 'C':

strcat(bin, "1100");

break;

case 'd':

case 'D':

strcat(bin, "1101");

break;

case 'e':

case 'E':

strcat(bin, "1110");

break;

case 'f':

case 'F':

strcat(bin, "1111");

break;

default:

printf("Invalid hexadecimal input."); }}

printf("Hexademial number = %s\n", hex);

printf("Binary number = %s", bin);

return 0;

}

18.Hexadecimal to Octal number system:

#include <stdio.h>

int main()

{

char hex[17];

long long octal, bin, place;

int i = 0, rem, val;

printf("Enter any hexadecimal number: ");

gets(hex);

octal = 0ll;

bin = 0ll;

place = 0ll;

for(i=0; hex[i]!='\0'; i++)

{

bin = bin \* place;

switch(hex[i])

{

case '0':

bin += 0;

break;

case '1':

bin += 1;

break;

case '2':

bin += 10;

break;

case '3':

bin += 11;

break;

case '4':

bin += 100;

break;

case '5':

bin += 101;

break;

case '6':

bin += 110;

break;

case '7':

bin += 111;

break;

case '8':

bin += 1000;

break;

case '9':

bin += 1001;

break;

case 'a':

case 'A':

bin += 1010;

break;

case 'b':

case 'B':

bin += 1011;

break;

case 'c':

case 'C':

bin += 1100;

break;

case 'd':

case 'D':

bin += 1101;

break;

case 'e':

case 'E':

bin += 1110;

break;

case 'f':

case 'F':

bin += 1111;

break;

default:

printf("Invalid hexadecimal input."); }

place = 10000; }

place = 1;

while(bin > 0)

{

rem = bin % 1000;

switch(rem)

{ case 0:

val = 0;

break;

case 1:

val = 1;

break;

case 10:

val = 2;

break;

case 11:

val = 3;

break;

case 100:

val = 4;

break;

case 101:

val = 5;

break;

case 110:

val = 6;

break;

case 111:

val = 7;

break; }

octal = (val \* place) + octal;

bin /= 1000;

place \*= 10; }

printf("Hexadecimal number = %s\n", hex);

printf("Octal number = %lld", octal);

return 0;

}

19.Hexadecimal to Decimal number system:

#include <stdio.h>

#include <math.h>

#include <string.h>

#define ARRAY\_SIZE 20

int main()

{

char hex[ARRAY\_SIZE];

long long decimal = 0, base = 1;

int i = 0, value, length;

printf("Enter hexadecimal number: ");

fflush(stdin);

fgets(hex,ARRAY\_SIZE,stdin);

length = strlen(hex);

for(i = length--; i >= 0; i--)

{

if(hex[i] >= '0' && hex[i] <= '9')

{

decimal += (hex[i] - 48) \* base;

base \*= 16; }

else if(hex[i] >= 'A' && hex[i] <= 'F')

{

decimal += (hex[i] - 55) \* base;

base \*= 16; }

else if(hex[i] >= 'a' && hex[i] <= 'f')

{ decimal += (hex[i] - 87) \* base;

base \*= 16; }}

printf("\nHexadecimal number = %s", hex);

printf("Decimal number = %lld\n", decimal);

return 0;

}