

## C Programming

### CU & WBSU Years Solve

1. Write a C program to count the total number of 1's in the binary representation of an integer.  
[2007]
2. WAP in C that reads an integer from standard input device and outputs the number of 1's in its binary representation to the standard output device. Note that the integer read is negative then its 2's complement will be considered as its binary response.

[2005][2008][2011][2014]

```
/* A program to count the total no of 1's in the binary representation of an
integer. If the no is negative 2's complement of the number should considered.
2005, 2008, 2011, 2014 */
```

```
#include<stdio.h>
#include<conio.h>
#include<math.h>

int main()
{
    int n,num, A[20],B[20],i,j, no_one = 0,k;

    clrscr();

    printf("\nEnter the integer to get the binary ");
    scanf("%d", &n);

    num = abs(n);

    //getting the binary of the no
    i=0;
    while(num>0)
    {
        A[i] = num % 2;
        num = num / 2;
        i = i + 1;
    }

    //print the binary
```

```

if(n>=0)
{
    printf("\nThe binary of %d is ", n);
    for(j=i-1; j>=0; j--)
    {
        printf("%d", A[j]);
        if(A[j] == 1)
            no_one += 1;
    }
}
else
{
    for(j=0; j<i; j++)
    {
        B[j] = A[j];
        if(A[j] == 1)
            break;
    }
    for(k=j+1; k<i; k++)
    {
        if(A[k] == 1)
            B[k] = 0;
        else
            B[k] = 1;
    }

    printf("\nThe 2's complement of the binary of %d is ",n);
    for(i=k-1; i>=0; i--)
    {
        printf("%d", B[i]);
        if(B[i] == 1)
            no_one += 1;
    }
}

printf("\nThe no of 1 is %d ",no_one );

getch();
return 0;
}

```

3. Write a program in C to check whether a five digit valid integer is a palindrome or not (for example: 15351 is a palindrome). Your program should include validation check for integers.

[2011]

```
#include<stdio.h>
#include<conio.h>
#include<stdlib.h>

int integer_valid(int n)
{
    int l, u, n_bit;

    n_bit = 8*sizeof(int);

    l = pow(-2, n_bit-1);
    u = pow(2, n_bit-1)-1;

    if(n > u || n < l)
        return 0;
    else
        return 1;
}

int main()
{
    int n, num, flag=0, rev, no = 0, r;

    clrscr();

    printf("\nEnter an integer to check ");
    scanf("%d",&n);

    num = n;

    if (integer_valid(n) == 0)
    {
        printf("\nGiven integer is invalid, program will terminate");
        getch();
        exit(0);
    }

    //reversing the number and counting the digits
    rev = 0;
    while(num>0)
    {
        r = num % 10;
        num = num / 10;
        rev = 10 * rev + r;
        no += 1 ;
    }

    if(no != 5)
```

```

        printf("\nThe number is %d digited ", no);
    else
    {
        printf("\nThe given no and its reverse are %d and %d\n",n,rev);
        if(rev != n)
            flag = 1;

        if (flag == 0)
            printf("\nThe no is palindrome ");
        else
            printf("\nThe no is not palindrome ");
    }

    getch();
    return 0;
}

```

**4. Write a function in C that accepts a ‘float’ argument and returns the string equivalent of it.**

**[2008][2011]**

**5. Write a program in C to check whether the bit pattern of a given integer variables is palindrome or not.**

**[2010]**

```

#include<stdio.h>
#include<conio.h>

int main()
{
    int n, num, i, j, A[20], Bin[20], flag = 0, k;

    clrscr();

    printf("\nEnter an integer to check whether bit pattern is palindrome
");
    scanf("%d",&n);
    num = n;

    // getting the binary
    i = 0;
    while(n>0)
    {
        A[i] = n % 2;
        n = n / 2;
        i = i + 1;
    }

    k = 0;
    printf("\nThe binary of %d is ",num);
    for(j=i-1;j>=0;j--)
    {
        Bin[k] = A[j];
    }
}

```

```

        printf("%d", Bin[k]);
        k = k + 1;
    }

    // Checking for palindrome
    for(k = 0; k < i; k++)
    {
        if(Bin[k] != A[k])
        {
            flag = 1;
            break;
        }
    }

    if(flag == 0)
        printf("\nThe binary of %d is palindrome ",num);
    else
        printf("\nThe binary of %d is not palindrome ",num);

    getch();
    return 0;
}

```

- 6. Write a program to copy the content of the source string into the destination string, without using strcpy() library function.**

**[2010]**

```

#include<stdio.h>
#include<conio.h>

int main()
{
    char str1[100], str2[100], i;

    clrscr();

    puts("Enter the source string to copy to another string ");
    gets(str1);

    i = 0 ;
    while(str1[i] != '\0')
    {
        str2[i] = str1[i];
        i = i + 1;
    }
    str2[i] = '\0';

    printf("\nThe copied string is ");
    puts(str2);

    getch();
    clrscr();
}

```

7. WAP that will take the name of a text file from command line and will print all the word/ string with a vowel into another file named “vowel.txt”.

[2010]

8. Using bitwise operation write a function write a function to count the number of 0's in the binary representation / comments.

[2009]

```
#include<stdio.h>
#include<conio.h>

//Display integer number into binary using bitwise operator
void printBinary(int num)
{
    int mask = 0x4000;
    if ((num & 0x8000) == 0)
        printf("0");
    else
        printf("1");
    while (mask != 0) {
        if ((num & mask) == 0)
            printf("0");
        else
            printf("1");
        mask = mask >> 1;
    }
}

void main() {
    int intNum;

    printf("\nEnter a integer number :");
    scanf("%d", &intNum);

    printf("\nInteger number in binary format :");
    printBinary(intNum);

    getch();
}
```

9. Write a C like algorithm to find the LCM of two positive integers. One way to achieve this is to find the GCD of Integers and divide the product of the integers by this GCD. Write the algorithm to find the LCM directly, without the use of GCD.

[2009]

```
#include<stdio.h>
```

```

int lcm(int,int);

int main(){

    int a,b,l;

    printf("Enter any two positive integers ");
    scanf("%d%d",&a,&b);

    if(a>b)
        l = lcm(a,b);
    else
        l = lcm(b,a);

    printf("LCM of two integers is %d",l);

    return 0;
}

int lcm(int a,int b){

    int temp = a;

    while(1){
        if(temp % b == 0 && temp % a == 0)
            break;
        temp++;
    }

    return temp;
}

```

**10. Write a C program to print the name of your program. That is the name of the program that it is executing.**

[2009]

**11. WAP using C to complete the roots of a quadratic equation  $ax^2 + bx + c = 0$ , given the values of a, b and c.**

[2007] [2008]

```

#include<stdio.h>
#include<conio.h>
#include<math.h>

int main()
{

```

```

float a,b,c,x1,x2,D;

clrscr();

printf("\nThis program finds the roots of a quadratic equation\n");
printf("\nEnter the coefficients a, b and c : ");
scanf("%f%f%f",&a,&b,&c);

//printf("\nThe given equation is %g*x^2 + %g*x + %g = 0\n",a,b,c);

if(a!=0)
{
    D = b*b - 4*a*c;
    if (D>=0)
    {
        x1 = (-b + sqrt(D))/(2*a);
        x2 = (-b - sqrt(D))/(2*a);
        printf("\nThe roots are %g and %g ",x1,x2);
    }
    else
    {
        //D = fabs(D);
        printf("\nThe roots are imaginary");
    }
}
else
    printf("\nThe given equation is not quadratic ");

getch();
return 0;
}

```

**12. Write a recursive function that returns the Greatest Common Divisor (GCD) of its two arguments (positive integer).**

**[2007]**

```

#include<stdio.h>
#include<conio.h>

int main()
{
    int x,y,m,n;

    printf("\nEnter any two integers ");
    scanf("%d%d",&x,&y);

    m = x;
    n = y;
    while (m!=n)
    {
        if(m>n)
            m = m-n;
    }
}

```



```

        else
            n = n-m;
    }

    printf("\nThe GCD of %d and %d is %d", x,y,n);

    getch();
    return 0;
}

```

- 13. An integer is divisible by 11 if the sum of the digits in odd position equates to the sum of the digits in even position of the integer. WAP in C to find whether a given integer is divisible by 11 following the above rule.**

[2008]

- 14. In 2-dimensional Cartesian co-ordinate system a point has two components namely (abscissa, ordinate). A line is an object connecting two such points. Using C structures how do you represent a point, and a line**

**Write a function in C that accept a line structure and returns**

- 1, if the line is horizontal,**
- 2, if the line is vertical, and**
- 3, if the line is oblique**

[2007]

- 15. The entire number, e, is used as the base of natural logarithm. It can be approximated using the formula**

$$e = 1 + \frac{1}{2!} + \frac{1}{3!} + \frac{1}{4!} + \dots + \frac{1}{n!}$$

**WAP that approximates e using a loop that terminates when the difference between \*\*\*\* successive values of e differ by less than 0.0000001**

[2007]

- 16. Write a function that, given a string, a width, and an empty string for output, centers the string in the output area. The function is to return 1 if the formatting is successful and 0 if any errors, such as string length greater than width, are found.**

[2007]

- 17. Write a function that returns the number of days in between two dates, which are accepted by the function as its arrangements.**

[2007]

**18. Write a function that uses bitwise operators to point the binary representation of an integer number.**

**[2007]**

```
#include<stdio.h>
#include<conio.h>

//Display integer number into binary using bitwise operator
void printBinary(int num)
{
    int mask = 0x4000;
    if ((num & 0x8000) == 0)
        printf("0");
    else
        printf("1");
    while (mask != 0) {
        if ((num & mask) == 0)
            printf("0");
        else
            printf("1");
        mask = mask >> 1;
    }
}

void main() {
    int intNum;

    printf("\nEnter a integer number :");
    scanf("%d", &intNum);

    printf("\nInteger number in binary format :");
    printBinary(intNum);

    getch();
}
```

**19. WAP to eliminate multiple spaces in a string. For example, a string such as “The quiz was great !!!” should be converted to “The quiz was great !!!”.**

**[2007]**

```
#include<stdio.h>
#include<conio.h>

void main()
{
    char input[100];
    int i = 0, j, n = 0;
    while ((input[n] = getchar()) != '\n') {
        n++;
    }
}
```

```

    }
    input[n] = '\0';
    while (i < n)
    {
        if(input[i]==' ' && (input[i+1]!=' ' || input[i-1]!=' '))
        {
            for(j=i;j<n;j++)
                input[j]=input[j+1];
            n--;
        }
        else
        {
            i++;
        }
    }
    printf("%s\n",input);
    printf("\n");
}

```

**20. Write a recursive function that returns the greatest common divisor of its two arguments (positive integer)**

**[2008]**

```

#include<stdio.h>
#include<conio.h>

int gcd(int x, int y)
{
    if(x % y == 0)
        return y;
    else
        return (gcd(y,x%y));
}

int main()
{
    int x,y;

    printf("\nEnter any two integers ");
    scanf("%d%d",&x,&y);

    printf("\nThe GCD of %d and %d is %d", x,y,gcd(x,y));

    getch();
    return 0;
}

```

**21. Consider the following –**

**Four integer variable d, m, y and yd is defined within with in main ( )**

**Read the values of y (year) and yd (date of that year) inside main.**

**Write a function to compute date (d) and month (m) for these values of y and yd**

**Print the values of d and m from main function**

**For example if y =2007 and yd=61 then d should be 2 and m should be 3; that is 2nd March, 2007 is the 61st day of the year (leap year should be considered)**

**[2007]**

**22. WAP in C that asks the user to enter a list of integers. The program has to output the largest value entered and the number of time it was entered.**

**[2006]**

```
#include<stdio.h>
#include<conio.h>

int main()
{
    int A[50],i,n,max, freq = 0;

    clrscr();

    printf("How many integers you want to insert? ");
    scanf("%d",&n);

    for(i=0;i<n;i++)
    {
        printf("\nEnter element: ");
        scanf("%d",&A[i]);
    }

    max = A[0];
    for(i=1;i<n;i++)
    {
        if(A[i]> max)
            max = A[i];
    }

    for(i=0;i<n;i++)
    {
        if(A[i] == max)
            freq = freq + 1;
    }

    printf("\nMaximum item is %d",max);
    printf(" and It has occurred %d no of times",freq);

    getch();
    return 0;
}
```

**23. WAP in that asks the user to enter an integer and checks if it is odd (using only bitwise operation). If the entered number is odd then output the number of 1's in its binary representation (using bitwise operation), otherwise out the integer is even.**

[2006]

**24. WAP that reads an integer from the keyboard and then calls a recursive function to print it out in reverse. For example, if the user enter 4762, it print 2674**

[2006]

```
/* C program to find the reverse of a number using recursion */
#include <stdio.h>
#include <math.h>

int rev(int, int);

int main()
{
    int num, result;
    int length = 0, temp;

    printf("Enter an integer number to reverse: ");
    scanf("%d", &num);
    temp = num;
    while (temp != 0)
    {
        length++;
        temp = temp / 10;
    }
    result = rev(num, length);
    printf("The reverse of %d is %d.\n", num, result);
    return 0;
}

int rev(int num, int len)
{
    if (len == 1)
        return num;
    else
        return (((num % 10) * pow(10, len - 1)) + rev(num / 10, --len));
}
```

**25. Write a C function that reads two positive integer and output the LCM of the integers.**

[2006]

```
#include<stdio.h>

int lcm(int,int);

int main(){
```

```

int a,b,l;

printf("Enter any two positive integers ");
scanf("%d%d",&a,&b);

if(a>b)
    l = lcm(a,b);
else
    l = lcm(b,a);

printf("LCM of two integers is %d",l);

return 0;
}

int lcm(int a,int b){

    int temp = a;

    while(1){
        if(temp % b == 0 && temp % a == 0)
            break;
        temp++;
    }

    return temp;
}

```

**26. Use a do-while loop to compute the sum of every third integer beginning with 2 for all integer less than 100, that is , the summation of 2, 5, 8, 11, ... etc.**

**[2006]**