

CP 111 Computer Programming, 2/2554, Section B01/B02

Programming Homework 04 solution

1. Problem name: End_with_1_or_4

```
#include <stdio.h>

int main()
{
    int num,nextnum;
    int digit;

    scanf("%d",&num);
    while(num!=1 && num!=4)
    {
        nextnum=0;
        do
        {
            digit = num % 10;
            num = num / 10;
            nextnum=nextnum+(digit*digit);
        }
        while (num != 0);

        printf("%d\n",nextnum);
        num=nextnum;
    }
    printf("\n");
}
```

2. Problem name: Black_Sheep

```
#include <stdio.h>

int main()
{
    int i,x,N,n_odd,n_even;
    int curr_odd,curr_even;

    scanf("%d",&N);
    n_odd=0;
    n_even=0;
    for(i=0;i<N;i++)
    {
        scanf("%d",&x);
        if(x%2==0)
        {
            curr_even=x;
            n_even++;
        }
        else
        {
            curr_odd=x;
            n_odd++;
        }

        if( n_odd==1 && n_even>1)
        {
            printf("%d",curr_odd);
            break;
        }
        else if(n_odd>1 && n_even==1)
        {
            printf("%d",curr_even);
            break;
        }
    }

    return 0;
}
```

3. Problem name: Diamond

```
#include <stdio.h>

int main()
{
    int x,y,N;

    scanf("%d",&N);

    for(y=-N/2;y<=N/2;y++)
    {
        for(x=-N/2;x<=N/2;x++)
        {
            if(abs(x)+abs(y)<=N/2)
            {
                printf("0");
            }
            else
            {
                printf(".");
            }
        }
        printf("\n");
    }
    return 0;
}
```

4. Problem name: Det3_Func

```
#include <stdio.h>

// Function prototype of Is_Prime
int Det3(int a11,int a12,int a13,
        int a21,int a22,int a23,
        int a31,int a32,int a33);
int Det2(int a11,int a12,int a21,int a22);

int main()
{
    int a11,a12,a13,a21,a22,a23,a31,a32,a33;
    int det;

    scanf("%d %d %d",&a11,&a12,&a13);
    scanf("%d %d %d",&a21,&a22,&a23);
    scanf("%d %d %d",&a31,&a32,&a33);
    det=Det3(a11,a12,a13,a21,a22,a23,a31,a32,a33);
    printf("%d\n",det);
    return 0;
}

int Det3(int a11,int a12,int a13,
        int a21,int a22,int a23,
        int a31,int a32,int a33)
{
    int det;
    det=a11*Det2(a22,a23,a32,a33);
    det=det-a21*Det2(a12,a13,a32,a33);
    det=det+a31*Det2(a12,a13,a22,a23);
    return det;
}

int Det2(int a11,int a12,int a21,int a22)
{
    int det;

    det=(a11*a22) - (a12*a21);

    return det;
}
```

5. Problem name: Prime_Factor

```
#include <stdio.h>

int Is_Prime(int x);

int main()
{
    int i,N;

    scanf("%d", &N);
    for(i=2;i<N;i++)
    {
        if(N%i==0)
        {
            if(Is_Prime(i)==1)
                printf("%d\n",i);
        }
    }

    return 0;
}

// Function definition of Is_Prime
int Is_Prime(int x)
{
    int i;

    for(i=2;i<x;i++)
    {
        if(x%i==0)
            return 0; // x is not a prime number
    }

    return 1;
}
```

6. Problem name: LCM_2

```
#include <stdio.h>
int lcm(int x,int y);
int main()
{
    int x,y;
    int lcm_val;
    while(1)
    {
        scanf("%d %d",&x,&y);
        if(x==0 && y==0)
            break;

        lcm_val=lcm(x,y);
        printf("%d\n",lcm_val);
    }

    return 0;
}

int lcm(int x,int y)
{
    int i,start,stop,lcm_val;

    start=x;
    stop=x*y;
    for(i=start;i<=stop;i++)
    {
        if(i%x==0 && i%y==0)
        {
            lcm_val=i;
            break;
        }
    }

    return(lcm_val);
}
```

7. Problem name: *Fibonacci_2*

```
#include <stdio.h>

int fibonacci_func(int n);

int main()
{
    int x, fib_n;

    do
    {
        scanf("%d", &x);
        if(x>=0)
        {
            fib_n=fibonacci_func(x);
            printf("%d\n", fib_n);
        }
    }
    while(x>=0);

    return 0;
}

int fibonacci_func(int n)
{
    int i, f_n_1, f_n_2, f_n;

    if(n==0)
        f_n=0;
    else if(n==1)
        f_n=1;
    else{
        f_n_1=1;
        f_n_2=0;
        for(i=2; i<=n; i++)
        {
            f_n=f_n_1+f_n_2;
            f_n_2=f_n_1;
            f_n_1=f_n;
        }
    }
    return(f_n);
}
```

8. Problem name: *Power_Func*

```
#include <stdio.h>
double Power(double,int);

int main()
{
    int n;
    double x,y1,y2;
    scanf("%lf %d",&x,&n);

    y1=Power(x,n);
    printf("%.2f\n",y1);

    return 0;
}

double Power(double x,int n)
{
    int i;
    double x_n;

    if(x==0)
        return(0);

    if(n==0)
        return(1);

    x_n=1;
    for(i=0;i<n;i++)
        x_n=x_n*x;

    for(i=0;i>n;i=i-1)
        x_n=x_n/x;
    return(x_n);
}
```