1.

```c
#include<stdio.h>
int main(){
    int fib_numbers[40]={0,1};
    for(int i=2;i<40;i++)
        fib_numbers[i]=fib_numbers[i-1]+fib_numbers[i-2];
    for(int i=0;i<40;i++)
        printf("%d ",fib_numbers[i]);
}
```

```
sunkai@sunkaideMacBook-Pro T % cd "/var/folders/bm/zgg2yp0d5rv5tkc4bm2prss80000gn/T/" && gcc tempCodeRunnerFile.c -o tempCodeRunnerFi
le && "/var/folders/bm/zgg2yp0d5rv5tkc4bm2prss80000gn/T/"tempCodeRunnerFile
0 1 1 2 3 5 8 13 21 34 55 89 144 233 377 610 987 1597 2584 4181 6765 10946 17711 28657 46368 75025 121393 196418 317811 514229 832040
 1346269 2178309 3524578 5702887 9227465 14930352 24157817 39088169 63245986 %
```

2.

```c
#include<stdio.h>
int main(){
    int cnt[10],p=0;
    printf("Enter a number:");
    for(int i=0;i<10;i++)
        cnt[i]=0;
    while(1){
        char a=getchar();
        if(a=='\n')
            break;
        cnt[a-'0']+=1;
        }
    for(int i=0;i<10;i++){
        if(cnt[i]>1)
            p++;
    }
    if(p==0)
        printf("-1");
    else{
        printf("Repeated digit(s):\n");
        for(int i=0;i<10;i++){
        if(cnt[i]>1)
            printf("%d %d\n",i,cnt[i]);
        }
    }
    return 0;
}
```

```
Enter a number:819287398123
Repeated digit(s):
1 2
2 2
3 2
8 3
9 2
```

3.

```c
#include<stdio.h>
int main(){
    int a[10000],b,l=0,r=9999;
    for(int i=0;i<10000;i++)
        a[i]=i;
    printf("enter your nember:");
    scanf("%d",&b);
    while(a[(l+r)/2]-b!=0){
    if(a[(l+r)/2]-b<0)
        l=(l+r)/2;
    if(a[(l+r)/2]-b>0)
        r=(l+r)/2;
    }
    printf("the place of the number is %d.",(l+r)/2);
}
```

```
sunkai@sunkaideMacBook-Pro T % cd "
 tempCodeRunnerFile && "/var/folder
enter your nember:4887
the place of the number is 4887.%
```

数组必须是单调的才能应用二分法，如果不是单调的可以先sort再二分

4.

```c
#include<stdio.h>
void multiply(int a[3][3],int b[3][3],int c[3][3]){
    for(int i=0;i<3;i++)
        for(int j=0;j<3;j++)
            c[i][j]=0;
    for(int i=0;i<3;i++)
        for(int j=0;j<3;j++)
            for(int k=0;k<3;k++)
                c[i][j]+=a[i][k]*b[k][j];
}
int main(){
    int a[3][3]={{1,2,3},{4,5,6},{7,8,9}},b[3][3]={{9,8,7},{6,5,4},{3,2,1}},c[3][3];
    multiply(a,b,c);
    printf("AxB is:\n");
    for(int i=0;i<3;i++){
        for(int j=0;j<3;j++)
            printf("%d ",c[i][j]);
        printf("\n");
    }
    multiply(b,a,c);
    printf("BxA is:\n");
    for(int i=0;i<3;i++){
        for(int j=0;j<3;j++)
            printf("%d ",c[i][j]);
        printf("\n");
    }
    return 0;
```

结果不相同：

```
AxB is:
30 24 18
84 69 54
138 114 90
BxA is:
90 114 138
54 69 84
18 24 30
```