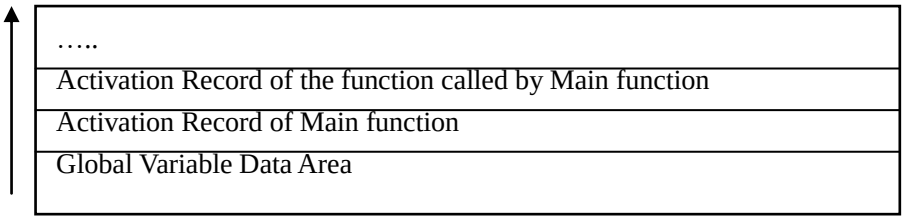
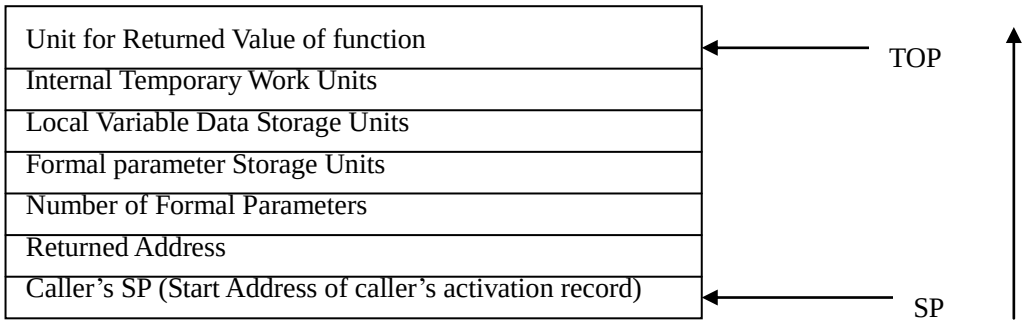
Exercises-Ch7

1.We assume that the storage organization and the form of activation record used in C language program run-time stack storage allocation are as following. Please **construct the run-time stack map when it gets the maximum size for the first time** for the following C program (10%).

Storage Organization of C Language



The Form of Activation Record of any a function in C



The C program is as the following:

```
#include <stdio.h>
int x,y;

int main()
{
```

```
    x=5;
    y=f(x);
}

int f(int n)
{
    if (n<=1)
          return 1;
   else
          if ( n==2)
                return 2;
          else
            {
          int t1,t2,t3,t4,t;
          t1=f(n-1);
          t2=f(n-2);
          t3=f(n-3);
          t4=t1+t2
              t=t3+t4;
          return t
            }
 }
```

Notes: 1) Here we assume that the caller's sp of Main function is the start address of global variable data area, and the returned address in the

activation record of a function (including Main function) is filled by the operating system automatically, you might not care it.

2) The initial value of variable X is 5, the start address of stack used in the program is K.

3) The stack map may get its maximum size for several times, here we ask you draw the stack map at maximum size for the first time.

2. We assume that the storage organization and the form of activation record used in C language program run-time stack storage allocation are as above. Please **construct the run-time stack map when it gets the maximum size** for the following C program (10%).

The C program is as the following:

#include <stdio.h>

int x,y,z;

```
int main()
{
   x=40;
   y=35;
   z=f(x,y);
}

int f(int m, int n)
{
   if (n>m) {
     int t;
     t=f(n,m);
     return t }
   else
      if (n==0) return m;
      else {
         int t1,t2;
         t1=m % n; //remainder of m/n
         t2=f(n,t1);
         return t2
         }
```

```
}
```

Notes: 1) Here we assume that the caller's sp of Main function is the start address of global variable data area, and the returned address in the activation record of a function (including Main function) is filled by the operating system automatically, you might not care it.

2) The initial value of variable X and Y are 40 and 35 respectively, the start address of stack used in the program is K.