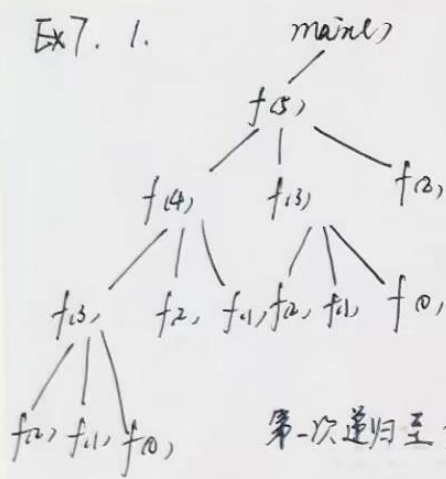


Ex 7. 1.

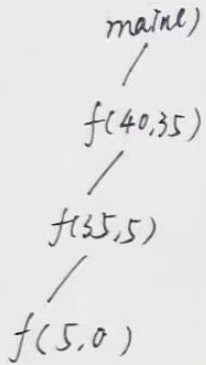


| | |
|-----|----------------------|
| t14 | K+4 (SP f(5)) |
| t13 | return value of f(5) |
| t12 | t |
| t11 | t4 |
| t10 | t3 |
| t9 | t2 |
| t8 | t1 |
| t7 | n 5 |
| t6 | 递归个数 1 |
| t5 | return address |
| t4 | K+2 (SP main) |
| t3 | return value of main |
| t2 | K (SP0) |
| t1 | x |

| | |
|-----|----------------------|
| t29 | t2 |
| t28 | t1 |
| t27 | n 3 |
| t26 | 递归个数 1 |
| t25 | return address |
| t24 | K+4 (SP f(4)) |
| t23 | return value of f(4) |
| t22 | t |
| t21 | t0 |
| t20 | t3 |
| t19 | t2 |
| t18 | t1 |
| t17 | n 4 |
| t16 | 递归个数 1 |
| t15 | return address |

| | |
|-----|----------------------|
| t38 | return value of f(3) |
| t37 | n 2 |
| t36 | 递归个数 1 |
| t35 | return address |
| t34 | K+4 (SP f(3)) |
| t33 | return value of f(3) |
| t32 | t |
| t31 | t0 |
| t30 | t3 |

2.



| | |
|-----|--------------------------|
| t13 | K+5 (SP f(40,35)) |
| t12 | return value of f(40,35) |
| t11 | t2 |
| t10 | t1 5 |
| t9 | n 35 |
| t8 | m 40 |
| t7 | 递归个数 2 |
| t6 | return address |
| t5 | K+3 (SP main) |
| t4 | return value of main |
| t3 | K (SP0) |
| t2 | x |
| t1 | y |
| K | x |

| | |
|-----|-------------------------|
| t25 | return value of f(5,0) |
| t24 | n 0 |
| t23 | m 5 |
| t22 | 递归个数 2 |
| t21 | return address |
| t20 | K+13 (SP f(35,5)) |
| t19 | return value of f(35,5) |
| t18 | t2 |
| t17 | t1 0 |
| t16 | n 5 |
| t15 | m 35 |
| t14 | 递归个数 2 |
| t13 | return address |

第7章作业

1. Please construct the run-time stack map when it gets the maximum size for the first time for the following C program.

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

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;
        }
    }
}
```

解.

| +3 | | returned value from f(5) | +23 | | returned value from f(4) | +33 | | returned value from f(3) | +43 | | returned value from f(1) |
|-----|--|--------------------------|-----|--|--------------------------|-----|--|--------------------------|-----|--|--------------------------|
| +12 | | t | +22 | | t | +32 | | t | +42 | | 1 |
| +11 | | t4 | +21 | | t4 | +31 | | t4 | +41 | | 1 |
| +10 | | t3 | +20 | | t3 | +30 | | t3 | +40 | | returned address |
| +9 | | t2 | +19 | | t2 | +29 | | t2 | +39 | | K+24 |
| +8 | | t1 | +18 | | t1 | +28 | | t1 | +38 | | returned value from f(2) |
| +7 | | 5 | +17 | | 4 | +27 | | 3 | +37 | | 2 |
| +6 | | 1 | +16 | | 1 | +26 | | 1 | +36 | | 1 |
| +5 | | returned address | +15 | | returned address | +25 | | returned address | +35 | | returned address |
| +4 | | K+2 | +14 | | K+4 | +24 | | K+17 | +34 | | K+24 |
| +3 | | returned value from main | +23 | | returned value from f(4) | +33 | | returned value from f(3) | +43 | | returned value from f(1) |
| +2 | | K | +12 | | t | +22 | | t | +32 | | t |
| +1 | | y | +11 | | t4 | +21 | | t4 | +31 | | t4 |
| K | | x | +10 | | t3 | +20 | | t3 | +30 | | t3 |

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2. Please construct the run-time stack map when it gets the maximum size for the following C program.

```
#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;
            t2 = f(n, t1);
            return t2;
        }
    }
}
```

解.

| | |
|----|--------------------------|
| +4 | returned value from main |
| +3 | K |
| +2 | z |
| +1 | y |
| K | x |

| | |
|-----|-------------------------------|
| +12 | returned value from f(40, 35) |
| +11 | t2 |
| +10 | t1 |
| +9 | 35 |
| +8 | 40 |
| +7 | 2 |
| +6 | returned address |
| +5 | K+3 |

| | |
|-----|------------------------------|
| +20 | returned value from f(35, 5) |
| +19 | t2 |
| +18 | t1 |
| +17 | 5 |
| +16 | 35 |
| +15 | 2 |
| +14 | returned address |
| +13 | K+5 |

| | |
|-----|-----------------------------|
| +28 | |
| +27 | |
| +26 | returned value from f(5, 0) |
| +25 | 0 |
| +24 | 5 |
| +23 | 2 |
| +22 | returned address |
| +21 | K+13 |