#include<stdio.h>

#include<stdlib.h>

int x=1;

int front=0;

int rear=0;

typedef struct

{

int key;

}term;

term \*element;

int j=0;

int isfull()

{

int r=(rear+1)%x;

if (front==r)

{

return 1;

}

else

{

return 0;

}

}

int isempty()

{

if(front==rear)

{

return 1;

}

else{

return 0;

}

}

void create()

{

element=(term\*)malloc(sizeof(term));

}

void copy(term \*a,term \*b,term \*nq)

{

term \*i;

term \*j;

i=nq;

j=a;

for(;j<b;i++,j++)

{

\*i=\*j;

}

}

void qfull()

{

term \*nq;

nq=(term\*)malloc(2\*x\*sizeof(term));

int start=(front+1)%x;

if(start<2)

{

copy(element+start,element+x,nq);

}

else

{

copy(element+start,element+x,nq);

copy(element,element+rear+1,nq+x-start);

}

front=2\*x-1;

rear=x-2;

x=x\*2;

free(element);

element=nq;

}

int delete()

{

if (isempty())

{

printf("Underflow");

exit(0);

}

else{

front=(front+1)%x;

}

return element[front].key;

}

void add(int item)

{

int r=(rear+1)%x;

if (front==r)

{

qfull();

}

rear=r;

element[rear].key=item;

}

void display()

{

int start=(front+1)%x;

if (start>=2&&rear<start)

{

for (int i=start;i<x;i++)

printf("%d\t",element[i].key);

for (int i=0;i<rear+1;i++)

printf("%d\t",element[i].key);

}

else

{

for (int i=(front+1)%x;i<=rear;i=(i+1)%x)

{

printf("%d\t",element[i].key);

}

}

}

void main()

{

create();

while(1)

{

int a;

printf("Enter the 1 to add, 2 to delete and 3 to display:\n");

scanf("%d",&a);

if (a==1)

{

int item;

printf("enter the item\n");

scanf("%d",&item);

add(item);

}

else if(a==2)

{

int n=delete();

printf("%d\n",n);

}

else{

display();

}

int c;

printf("Enter 1 to continue and 0 to exit:\n");

scanf("%d",&c);

if (c==0)

{

printf("Thank you!!\n");

break;

}

}

}