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id: 2019-2-60-038

Q1:

```
#include<stdio.h>
int main()
```

Algorithm:

```
int Ackerman(int m, int n){
    if (m==0) return n+1;
else if(m>0 && n==0){
        return Ackerman(m-1, 1);
else{
        return Ackerman(m-1, Ackerman(m,n-1));
    }
}
```

a) a)

third condition

Ackerman (2, 4) = Ackerman (1, Ackerman (2, 3));

(1, 9) → 11

Ackerman (2, 3) = Ackerman (1, (Ackerman (2, 2));

(1, 7) → 9

Ackerman (2, 2) = // (1, Ackerman (2, 1))

(1, 5) → 7

Ackerman (2, 1) = // (1, Ackerman (2, 0)) // 5

(1, 3)

Ackerman (2, 0) = Ackerman (1, 1) // 3

Ackerman (1, 1) = Ackerman (0, Ackerman (1, 0)) 2

Ackerman (1, 0) = Ackerman (0, 1) // 2

Ackerman (0, 1) = return n+1

1+1 = 2

output: 11

c] Ackerman(0, 4) = return 4 + 1

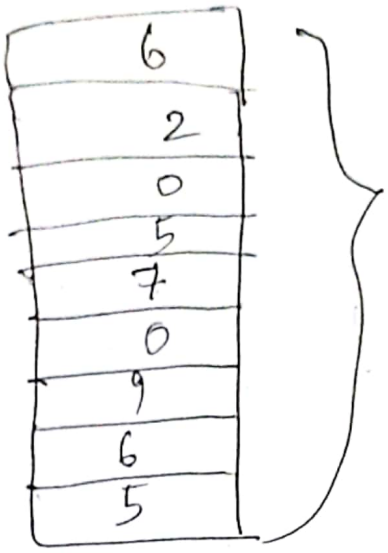
output : 5

d] Ackerman(5, 0) = Ackerman(4, 1)

" (4, 1) = Ackerman(4, Ackerman(4, 0))

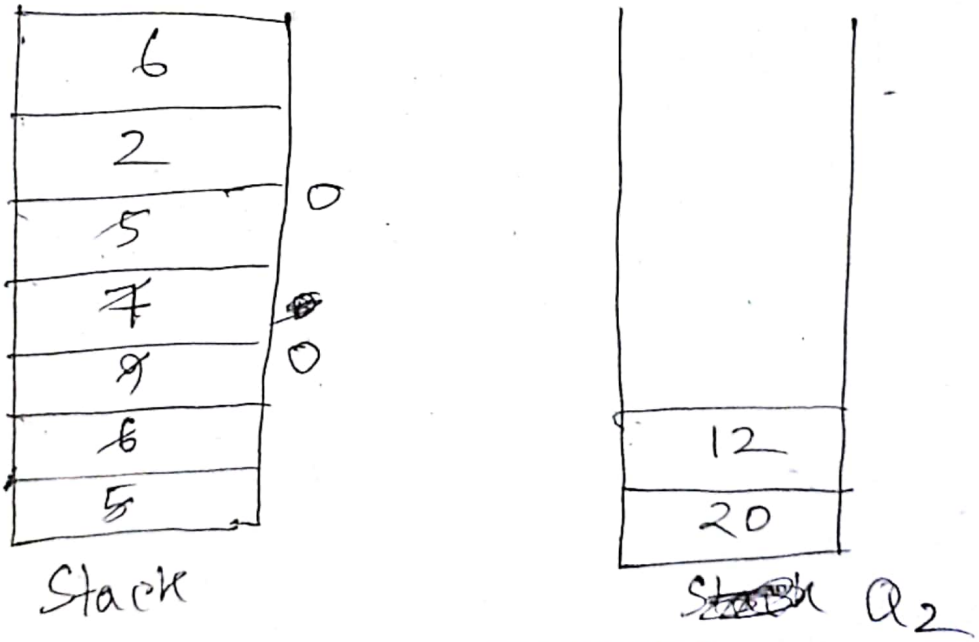
" (4, 0) = Ackerman(3, 1)

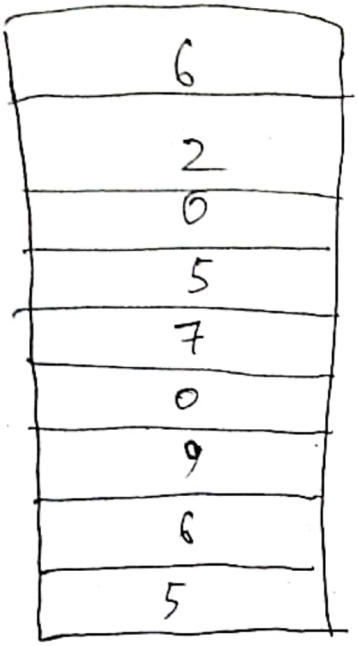
2]



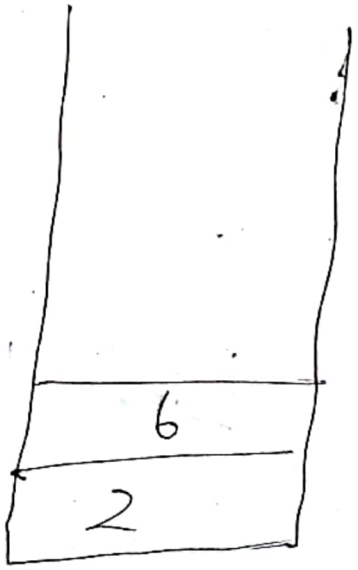
3] checking if Q1 is empty or not

4] calling dequeue (Q1, x)

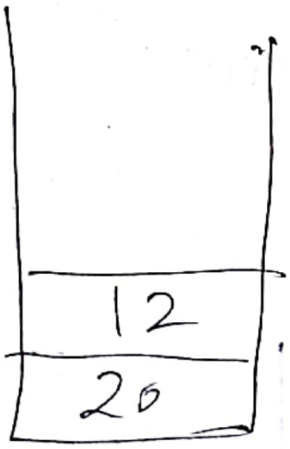




Q1



Stack



Q2

Final results