30/07/2020

Q.1)

```
        A
      B   B   B
    C   C   C   C   C
  D   D   D   D   D   D   D
E   E   E   E   E   E   E   E   E
```

```
#include <stdio.h>
void main () {
    char ch = 'A';
    for(int row = 1; row<=5; row++){
      for (int space = 4; space>=row; space--){
            printf("\t");
        }
      for (int col = 1; col<=row*2-1; col++){
            printf("%c\t", ch);
        }
        ch++;
        printf ("\n");
    }
}
```

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• Dry Run

Variables Conditions statement Print/decre

ch	row	row<=5	space=4	space>=row	PF(" ") col	col<=row*2-1	PF(ch)
A	1	1<=5	4	4>=1	-	1 1<=1	A
			3	3>=1	-	2 2<=1 X	
			2	2>=1	-		
			1	1>=1	-		
			0	0>=1 X			
B	2	2<=5	4	4>=2	-	1 1<=3	B
			3	3>=2	-	2 2<=3	B
			2	2>=2	-	3 3<=3	B
			1	1>=2 X		4 4<=3 X	
C	3	3<=5	4	4>=3	-	1 1<=5	C
			3	3>=3	-	2 2<=5	C
			2	2>=3 X		3 3<=5	C
						4 4<=5	C
						5 5<=5	C
						6 6<=5 X	
D	4	4<=5	4	4>=4	-	1 1<=7	D
			3	3>=4	-	2 2<=7	D
						3 3<=7	D
						4 4<=7	D
						5 5<=7	D
						6 6<=7	D
						7 7<=7	D
						8 8<=7 X	

E 5 $5 <= 5$ 4 $47 = 5$ X

1	$1 <= 9$	E
2	$2 <= 9$	E
3	$3 <= 9$	E
4	$4 <= 9$	E
5	$5 <= 9$	E
6	$6 <= 9$	E
7	$7 <= 9$	E
8	$8 <= 9$	E
9	$9 <= 9$	E
10	$10 <= 9$ X	

F 6 $6 <= 5$ X

Q.2)

```
        1
      1 2 3
    1 2 3 4 5
  1 2 3 4 5 6 7
1 2 3 4 5 6 7 8 9
```

```
#include<stdio.h>
void main () {
    for(int row=1; row<=5; row++){
        int num1=1;
        for(int space=4; space>=row; space--){
            printf("\t");
        }
        For(int col=1; col<=row*2-1; col++){
            printf("%d\t", num1);
            num1++;
        }
        printf("\n");
    }
}
```

• Dry Run

row	row<=5	num	space	space>=row	pf(" ")	col	col<=row*2-1	pf(num)
1	1<=5	1	4	4>=1	-	1	1<=1	1
		2	3	3>=1	-	2	2<=1 X	
			2	2>=1	-			
			1	1>=1	-			
			0	0>=1 X				
2	2<=5	1	4	4>=2	-	1	1<=3	1
		2	3	3>=2	-	2	2<=3	2
		3	2	2>=2	-	3	3<=3	3
		4	1	1>=2 X		4	4<=3 X	
3	3<=5	1	4	4>=3	-	1	1<=5	1
		2	3	3>=3	-	2	2<=5	2
		3	2	2>=3	-	3	3<=5	3
		4				4	4<=5	4
		5				5	5<=5	5
		6				6	6<=5 X	
4	4<=5	1	4	4>=4	-	1	1<=7	1
		2	3	3>=4 X		2	2<=7	2
		3				3	3<=7	3
		4				4	4<=7	4
		5				5	5<=7	5
		6				6	6<=7	6
		7				7	7<=7	7
		8				8	8<=7	X

row row<=5 numi space space>=row ~~*col~~ pf(" ") col col<row*2-1 pf(

5	5<=5	1	4	4>=5 X	1	1<=9	1
		2			2	2<=9	2
		3			3	3<=9	3
		4			4	4<=9	4
		5			5	5<=9	5
		6			6	6<=9	6
		7			7	7<=9	7
		8			8	8<=9	8
		9			9	9<=9	9
		10			10	10<=9 X	

6 6<=5X

f(num) Q.3)

```
                1
            8   1   4
        27  8   1   4   9
    64  27  8   1   4   9   16
```

```
#include<stdio.h>
void main(){
    int num=1;
    for(int row=1; row<=4; row++){
        printf("\t");
    }
    for(int space=3; space>=row; space--){
        printf("\t");
    }
    for(int col=1; col=row*2-1; col++){
        if(col>=row){
            printf("%d\t", num*num);
            num++;
        }
        else{
            printf("%d\t", num*num*num);
            num--;
        }
    }
    printf("\n");
}
}
```

• dry Run

num	row	row<=4	space	space>=row	PF(" ")	col	col<=row*2-1	PF(num)
1	1	1<=4	3	3>=1	—	1	1<=1	1
			2	2>=1	—	2	2<=1 X	
			1	1>=1	—			
			0	0>=1 X				
1	2	2<=4	3	3>=2	—	1	1<=3	1
2			2	2>=2	—	2	2<=3	8
3			1	1>=2 X		3	3<=3	27
						4	4<=3 X	
1	3	3<=4	3	3>=3	—	1	1<=5	1
2			2	2>=3 X		2	2<=5	8
3						3	3<=5	27
2						4	4<=5	64
1						5	5<=5	9
1	4	4<=4	3	3>=4 X		1	1<=7	1
2						2	2<=7	8
3						3	3<=7	27
4						4	4<=7	64
3						5	5<=7	4
2						6	6<=7	9
1						7	7<=7	16
1						8	8<=7 X	
	5	5<=4						

Q.5

```
                D
            C   D   C
        B   C   D   C   B
    A   B   C   D   C   B   A
```

```
#include <stdio.h>
void main() {
    char ch = 'D';
    for (int row = 1; row <= 4; row++) {
        for (int space = 3; space >= row; space--) {
            printf("\t");
        }
        for (int col = 1; col <= row*2-1; row++) {
            printf("%c\t", ch);
            if (col >= row) {
                ch--;
            }
            else {
                ch++;
            }
        }
        printf("\n");
    }
}
```

- Dry Run

ch	row	row<=4	space=3	space>=row	col	col<=row*2-1	PF(ch)
D	1	1<=4	3	3>=1	1	1<=1	D
			2	2>=1		2<=1 X	
			1	1>=1			
			0	0>=1 X			
D	2	2<=4	3	3>=2	1	1<=3	D
C			2	2>=2	2	2<=3	C
			1	1>=2 X	3	3<=3	C
						4<=3 X	
D	3	3<=4	3	3>=3	1	1<=5	D
C			4	4>=3 X	2	2<=5	C
B					3	3<=5	B
C					4	4<=5	C
B					5	5<=5	B
					6	6<=5 X	
D	4	4<=4	3	3>=4 X	1	1<=7	D
C					2	2<=7	C
B					3	3<=7	B
A					4	4<=7	A
B					5	5<=7	B
B					6	6<=7	B
A					7	7<=7	A
D	5	5<=4 X					