Nested Loop

for (init ① ; test_cond ② ; shift ⑨)
{
    for(init ④ ; test_cond ⑤ ; shift ⑦)
    {
        ⑥
    } ⑧
}

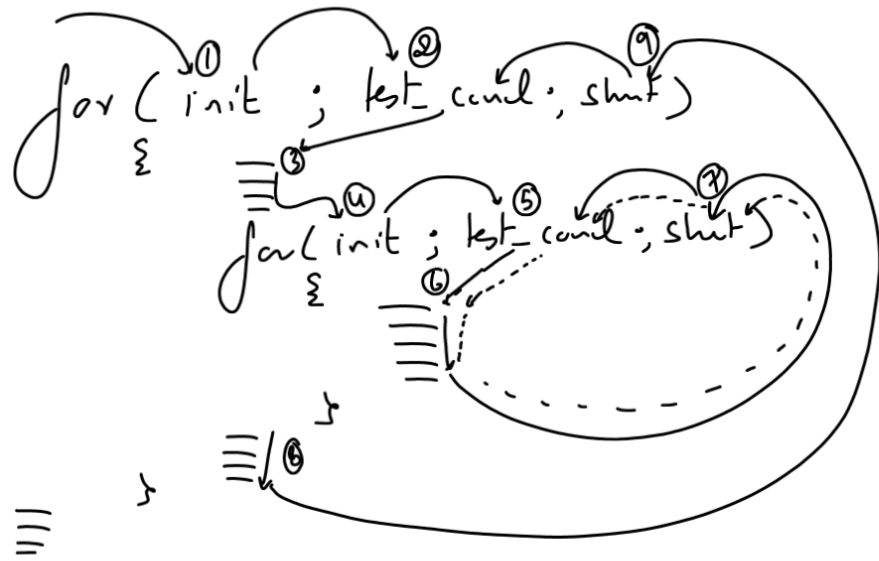int main( )
{
    int i, j;

    for (i = 1 ; i <= 3 ; i++)
    {
        for (j = 10 ; j <= 15 ; j++)
        {
            printf(" .l.d ", j);
        }
        printf("\n");
    }
    return 0;
}

i=1	i=2	i=3	i=4
j=10	j=10	j=10	
11	11	11	
12	12	12	
13	.	13	
14	16	.	
15		16	
16			

10	11	12	13	14	15
10	11	12	13	14	15
10	11	12	13	14	15

```
int main( )
{   int i, j;

    for (i=1; i<=4; i++)
    {
        for(j=1; j<=3; j++)
        {
            printf("*   ");
        }
        printf("\n");
    }
    return 0;
}
```

i=1	i=2	i=3
j=1	j=1	
2	:	
3	4	
4		


```
int main( )
{   int i, j;

    for (i=1; i<=4; i++)
    {
        for (j=1; j<=i; j++)
        {
            printf("*  ");
        }
        printf("\n");
    }
    return 0;
}
```

i=1	i=2	i=3	i=4	i=5
j=1	j=1	j=1	j=1	
2	2	2	2	
	3	3	3	
		4	4	
			5	

```
int main()              i=1  | i=2 | i=3 | i=4 | i=5
{   int i,j;            j=1  | j=1 | j=1 | j=1 |
                          2  |  2  |  2  |  2  |
                             |  3  |  3  |  3  |
    for(i=1; i<=4; i++)      |     |  4  |  4  |
    {                        |     |     |  5  |
        for(j=1; j<=i; j++)
        {                              1
            printf("%d ", j);          1  2
        }                              1  2  3
        printf("\n");                  1  2  3  4
    }
    return 0;
}
```

```
int main()              i=1  | i=2 | i=3 | i=4 | i=5
{   int i,j;            j=1  | j=1 | j=1 | j=1 |
                          2  |  2  |  2  |  2  |
                             |  3  |  3  |  3  |
    for(i=1; i<=4; i++)      |     |  4  |  4  |
    {                        |     |     |  5  |
        for(j=1; j<=i; j++)
        {                              1
            printf("%d ", i);          2  2
        }                              3  3  3
        printf("\n");                  4  4  4  4
    }
    return 0;
}
```

```
int main()
{   int i, j;

    for (i=1; i<=4; i++)
    {
        for (j=1; j<=i; j++)
        {
            printf("%d ", i*j);
        }
        printf("\n");
    }
    return 0;
}
```

i=1	i=2	i=3	i=4	i=5
j=1 2	j=1 2 3	j=1 2 3 4	j=1 2 3 4 5	

①
② ④
③ ⑥ ⑨
④ ⑧ ⑫ ⑯
—

```
int main()
{   int i, j;

    for (i=1; i<=4; i++)
    {
        for (j=4; j>=i; j--)
        {
            printf("%d ", j);
        }
        printf("\n");
    }
    return 0;
}
```

i=1	i=2	i=3	i=4	i=5
j=4 3 2 1 0	j=4 3 2 1	j=4 3 2	j=4 3	

④ ③ ② ①
④ ③ ②
④ ③
④

①

```
4
4  3
4  3  2
4  3  2  1
```

②

```
4  3  2  1
   3  2  1
      2  1
         1
```

③

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

④

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

⑤

```
1
2  3
4  5  6
7  8  9  10
```

⑥

```
         1
       1  2
     1  2  3
   1  2  3  4
```

⑦

```
         1
      1  2  1
   1  2  3  2  1
1  2  3  4  3  2  1
```

```c
int main( )
{
    int n, i, x, Sum;
    int rem;

    printf("Enter an int:");
    scanf("%d", &n);

    for(i=1; i<=n; i++)
    {
        x = i;
        Sum = 0;
        while(x > 0)
        {
            rem = x % 10;
            Sum = Sum + rem * rem * rem;
            x = x / 10;
        }
        if(Sum == i)
            printf("%d", i);
    }
    return 0;
}
```

n = 200

i = 153
x = 153
Sum = 0

a. rem = 153 . %10 = 3
   Sum = 0 + 27 = ⟶ (27)

b. rem = 15 . %10 = 5
   Sum = 27 + 125 = ⟶ 152

c. rem = 1 . %10
   = ⟶ 1
   Sum = 152 + 1
   = ⟶ (153)

1
153]

1
15 3]
370
371
407