ITERATIVE STATEMENTS

Exercises:

1)
```
int i=5;
while(i>=1)
{
    printf("%d ", i);
    i--;
}
```

2)
```
int i=2;
while(i<=10)
{
    printf("%d ", i);
    i+=2;
}
```

3)
```
int i=1;
while(i<=9)
{
    printf("%d ", i);
    i+=2;
}
```

4)
```
int i=9;
```

```
while(i>=1)
{
    printf("%d ", i);
    i-=2;
}
```

5)
```
int n, i=1, sum=0;
printf("Enter the limit : ");
scanf("%d", &n);
while(i<=n)
{
    sum+=(i*i);
    i++;
}
printf("Sum = %d", sum);
```

6)
```
int n, i=1; float sum=0.0;
printf("Enter the limit : ");
scanf("%d", &n);
while(i<=n)
{
    sum+=(i*i)/(i+1);
    i++;
}
printf("Sum = %0.2f", sum);
```

7)
```
int n, i=1, sum=0;
printf("Enter the limit : ");
```

```
scanf("%d", &n);
while(i<=n)
{
    sum+=i;
    sum=-sum;
    i++;
}
printf("Sum = %d", abs(sum));  // include <stdlib.h> for abs()
```

8)
```
int r, m, n, p;
printf("Enter two numbers : ");
scanf("%d %d", &m, &n);
p=m*n;
while(1)
{
    r=m%n;
    if(r==0)
        break;
    m=n;
    n=r;
}
printf("LCM = %d", p/n);
```

9)
```
int sm, m, n, i=1, hcf;
printf("Enter two numbers : ");
scanf("%d %d", &m, &n);
sm=m;
if(n<m)
    sm=n;
```

```
while(i<=sm)
{
    if(m%i==0 && n%i==0)
        hcf=i;
    i++;
}
printf("HCF = %d", hcf);
```

10)
```
int c=0, num;
printf("Enter a number : ");
scanf("%d", &num);
while(num>0)
{
        num=num/10;
        c++;
}
printf("Number of digits : %d", c);
```

11)
```
int num, rem, p=1;
printf("Enter a number : ");
scanf("%d", &num);
while(num>0)
{
        rem=num%10;
        num=num/10;
        p=p*rem;
}
printf("Product of digits : %d", p);
```

12)
```
int num, rem, s=0;
printf("Enter a number : ");
scanf("%d", &num);
while(num>0)
{
        rem=num%10;
        num=num/10;
        s=s+rem;
}
printf("Sum of digits : %d", s);
```

13)
```
int num, rem, rev=0, n;
printf("Enter a number : ");
scanf("%d", &num);
n=num;
while(n>0)
{
        rem=n%10;
        rev=rev*10+rem;
        n=n/10;
}
if(rev==num)
        printf("Palindrome!");
else
        printf("Non palindrome!");
```

14)
```
int num, rem, sum=0, c=0, n;
printf("Enter a number : ");
```

```
scanf("%d", &num);
n=num;
while(n>0)
{
        n=n/10;
        c++;
}
n=num;
while(n>0)
{
        rem=n%10;
        sum+=pow(rem, c);
        n=n/10;
}
if(sum==num)
        printf("Armstrong!");
else
        printf("Non armstrong!");
```

15)

```
int n, i=1; float sum=0.0;
printf("Enter the limit : ");
scanf("%d", &n);
while(i<=n)
{
        sum+=pow(i, 2)/(i+1);
        i++;
}
printf("Sum = %0.2f", sum);
```

16)
```
int a=0, b=1, c, i=3, sum=1, n;
printf("Enter the limit : ");
scanf("%d", &n);
while(i<=n)
{
        c = a+b;
        sum+=c;
        a=b;
        b=c;
        i++;
}
printf("Sum = %d", sum);
```

17)
```
int a, b, c=0, c1=0, c2=0, c3=0, i;
printf("Enter the numbers : ");
scanf("%d %d", &a, &b);

if(abs(a-b)==2)
        c1=1;

for(i=1; i<=a; i++)
        if(a%i==0)
                c++;
if(c==2)
        c2=1;

c=0;
for(i=1; i<=b; i++)
        if(b%i==0)
                c++;
```

```
if(c==2)
        c3=1;

if(c1 && c2 && c3)
        printf("Twin primes!");
else
        printf("Not Twin primes");
```

18)
```
int m, n, i, c=0, rem;
printf("Enter dividend : ");
scanf("%d", &m);
printf("Enter divisor : ");
scanf("%d", &n);
for(i=n; i<=m; i+=n)
        c++;
rem=m-(i-n);
printf("Quotient is %d\n", c);
printf("Remainder is %d\n", rem);
```

19)
```
int n, j, i;
long fact;
printf("Enter the limit : ");
scanf("%d", &n);
for(i=1; i<=n; i++)
{
        fact=1;
        printf("Factorial of %d : ", i);
        for(j=1; j<=i; j++)
                fact=fact*j;
```

```
        printf("%ld\n", fact);
    }
```

20)
```
    int m, n, j, i, c;
    printf("Enter lower and upper limits : ");
    scanf("%d %d", &m, &n);
    for(i=m; i<=n; i++)
    {
        c=0;
        for(j=1; j<=i; j++)
            if(i%j==0)
                c++;
        if(c==2)
            printf("%d ", i);
    }
```

21)
```
    int n, i, j, t;
    printf("Enter the limit : ");
    scanf("%d", &n);
    for(i=1; i<=n; i++)
    {
        printf("Table of %d : ", i);
        for(j=1; j<=10; j++)
        {
            t=i*j;
            printf("%d ", t);
        }
        printf("\n");
```

```
}
```

22)
```
int m, n, i, j, k, c;
printf("Enter lower and upper limits : ");
scanf("%d %d", &m, &n);
for(i=m; i<=n-2; i++)
{
        c=0; k=0;
        for(j=1; j<=i; j++)
                if(i%j==0)
                        c++;
        for(j=1; j<=(i+2); j++)
                if((i+2)%j==0)
                        k++;
        if(c==2 && k==2)
                printf("%d, %d\n", i, i+2);
}
```

23)
```
int f, num, n, sum=0, rem, i;
printf("Enter the number : ");
scanf("%d", &num);
n=num;
while(n>0)
{
        rem=n%10;
        f=1;
        for(i=1; i<=rem; i++)
                f=f*i;
        sum+=f;
```

```
        n=n/10;
    }
    if(sum==num)
        printf("Special!");
    else
        printf("Nothing special!");
```

24)
```
    int i, j, sum=0, n;
    printf("Enter the limit : ");
    scanf("%d", &n);
    for(i=1; i<=n; i++)
        for(j=1; j<=i; j++)
            sum=sum+j;
    printf("Sum = %d", sum);
```

25)
```
    int i, j;
    for(i=5; i>=1; i--)
    {
        for(j=1; j<=i; j++)
            printf("%d", j);
        printf("\n");
    }
```

26)
```
    int i, j;
    for(i=1; i<=5; i++)
    {
        for(j=5; j>=i; j--)
            printf("%d", j);
```

```
        printf("\n");
    }
```

27)
```
    int i, j;
    for(i=1; i<=5; i++)
    {
        for(j=i; j<=5; j++)
            printf("%d", j);
        printf("\n");
    }
```

28)
```
    int i, j;
    for(i=5; i>=1; i--)
    {
        for(j=i; j>=1; j--)
            printf("%d", j);
        printf("\n");
    }
```

29)
```
    int i, j;
    for(i=1; i<=5; i++)
    {
        for(j=1; j<=i; j++)
            printf("%d", i);
        printf("\n");
    }
```

30)
```
int i, j, sum;
for(i=1; i<=5; i++)
{
        sum=0;
        for(j=1; j<=i; j++)
        {
                printf("%d ", j);
                sum+=j;
        }
        printf("%d", sum);
        printf("\n");
}
```

31)
```
int i, j;
for(i=5; i>=1; i--)
{
        for(j=i; j<=5; j++)
                printf("%d ", j%2);
        printf("\n");
}
```

32)
```
int i, j;
for(i=1; i<=10; i++)
{
        for(j=1; j<=10; j+=i)
                printf("%d ", j);
        printf("\n");
}
```

33)
```
int i, j;
for(i=65; i<=69; i++)
{
        for(j=65; j<=i; j+=1)
                printf("%c", j);
        printf("\n");
}
```

34)
```
int i, j, g, gap=3;
for(i=1; i<=7; i+=2)
{
        for(g=1;g<=gap; g++)
                printf(" ");
        gap--;
        for(j=1; j<=i; j+=1)
                printf("*");
        printf("\n");
}
```

35)
```
int i, j, g, k, gap;
for(i=69, gap=-1; i>=65; i-=1, gap+=2)
{
        for(j=65; j<=i; j++)
                printf("%c", j);
        for(g=1; g<=gap; g++)
                printf(" ");
        for(k=j-1; k>=65; k--)
                if(k!=69)
                        printf("%c", k);
```

```
            printf("\n");
        }
```

Aptitude Patterns:

1)
```
int i, j, l, k, m;
for(i=1, k=1; i<=5; i+=1, k+=2)
{
    for(l=1; l<=(5-i); l+=1)
        printf(" ");
    for(j=i; j<=k; j++)
        printf("%d", j);
    for(m=j-2; m>=i; m--)
        printf("%d", m);
    printf("\n");
}
```

2)
```
int i, j, s, k;
for(i=1; i<=4; i+=1)
{
    printf("%d", i);
    k=3;
    s=i;
    for(j=2; j<=i; j++)
    {
        s=s+k;
        printf("%d", s);
        k--;
```

```
        }
        printf("\n");
    }
```

3)
```
    int i, j, g, k=1;
    for(i=1; i<=7; i+=2)
    {
        for(g=3; g>=k; g--)
            printf(" ");
        for(j=1; j<=i; j++)
            printf("*");
        printf("\n");
        k++;
    }
    k=1;
    for(i=5; i>=1; i-=2)
    {
        for(g=1; g<=k; g++)
            printf(" ");
        for(j=1; j<=i; j++)
            printf("*");
        printf("\n");
        k++;
    }
```

4)
```
    int i, j;
    for(i=1; i<=7; i+=2)
    {
        for(j=1; j<=9; j+=1)
```

```
            printf("%d", i);
        printf("%d\n", i+1);
        printf("%d", i+2);
        for(j=2; j<=10; j++)
            printf("%d", i+1);
        printf("\n");
    }
```

5)
```
    int i, g, j;
    for(i=5, g=0; i>=1; i--, g++)
    {
        for(j=1; j<=i; j+=1)
            printf("*");
        for(j=1; j<=g; j+=1)
            printf(" ");
        for(j=1; j<=i; j+=1)
            printf("*");
        for(j=1; j<=g; j+=1)
            printf(" ");
        printf("\n");
    }
    for(i=2, g=3; i<=5; i++, g--)
    {
        for(j=1; j<=i; j+=1)
            printf("*");
        for(j=1; j<=g; j+=1)
            printf(" ");
        for(j=1; j<=i; j+=1)
            printf("*");
        for(j=1; j<=g; j+=1)
```

```
                printf(" ");
        printf("\n");
}
```

6)
```
int i, g, j;
for(i=65; i<=69; i++)
{
        if(i%2)
        {
                for(j=65; j<=i; j++)
                        printf("%c", j);
                printf("\n");
        }
        else
        {
                for(g=j; g>=65; g--)
                        printf("%c", g);
                printf("\n");
        }
}
```

7)
```
int i, k, j;

for(i=1; i<=7; i++)
        printf("*");
printf("\n");

for(i=6; i>=2; i-=2)
{
```

```
        for(j=1; j<=(i/2); j++)
                printf("*");
        for(k=1; k<=(7-i); k++)
                printf(" ");
        for(j=1; j<=(i/2); j++)
                printf("*");
        printf("\n");
}

for(i=4; i<=6; i+=2)
{
        for(j=1; j<=(i/2); j++)
                printf("*");
        for(k=1; k<=(7-i); k++)
                printf(" ");
        for(j=1; j<=(i/2); j++)
                printf("*");
        printf("\n");
}

for(i=1; i<=7; i++)
        printf("*");
printf("\n");
```

8)
```
int i, k=1, j, g, gap=1;
for(i=1; i<=4; i++)
{
        for(g=1; g<=(4-i); g++)
                printf(" ");
```

```
        for(j=i; j>=1; j--)
                i%2?printf("*"):printf("%d", j);
        for(j=j+2; j<=i; j++)
                i%2?printf("*"):printf("%d", j);
        printf("\n");
    }
    for(i=3; i>=1; i--)
    {
        for(g=1; g<=gap; g++)
                printf(" ");
        for(j=i; j>=1; j--)
                i%2?printf("*"):printf("%d", j);
        for(j=j+2; j<=i; j++)
                i%2?printf("*"):printf("%d", j);
        printf("\n");
        gap++;
    }
```

Aptitude Questions:

1) If we enter n as input, we get the series n (n-1) (n-2) … 2 1

2) 7 5 3 … - ∞

3) 1

4) 3 1
   1 3
   0 4

-1 5

5) Hail Mogambo!

Hail Mogambo!

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