

PATUAKHALI SCIENCE AND TECHNOLOGY UNIVERSITY

COURSE CODE CIT-112

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Assignment: 06 (Basic Code)

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1) Reversing digits

```
#include<stdio.h>
int main()
{
    int n;
    scanf("%d", &n);

    int reverse=0;
    while (n>0)
    {
        reverse *= 10;
        reverse += n % 10;
        n /= 10;
    }
    printf("%d", reverse);
}
```

```
~/Desktop/lab/ansi-c-balagurusamy-exercise/solutions/sharafat/7
> cl 1.c
compiling 1
  0.04s user 0.02s system 96% cpu 0.064 total

123
321%
```

2) Euler's Number

```
#include <stdio.h>
```

```
int main()
{
    float accuracy = 0.00001;
    float result=1, sum = 1;
    int i = 1;

    while ( sum > accuracy )
    {
        result += sum;
        i++;
        sum *= ((float)1/i);
    }

    printf("Result -> %f", result);
}
```

```
~/Desktop/lab/ansi-c-balagurusamy-exercise/solutions/sharafat/7
> cl 10.c
compiling 10
  0.04s user 0.02s system 94% cpu 0.067 total

Result → 2.718279%
```

3) Functions calculate

```
#include <stdio.h>
```

```
#include <math.h>
```

```
int main()
```

```
{
```

```
    float accuracy = 0.0001, x;
```

```
    scanf("%f", &x);
```

```
    float result=1, sum = x;
```

```
    int i = 1;
```

```
    while ( sum > accuracy || sum < 0 )
```

```
    {
```

```
        result += sum;
```

```
        i += 2;
```

```
        sum *= (-1)*(x*x)/(i*(i-1));
```

```
        if (i >= 100)
```

```
            break;
```

```
    }
```

```
    printf("sinx -> %f\n", result);
```

```
    result=1, sum = 1;
```

```
    i = 0;
```

```
    while ( sum > accuracy || sum < 0 )
```

```
    {
```

```
        result += sum;
```

```
        i += 2;
```

```
        sum *= (-1)*(x*x)/(i*(i-1));
```

```
        if (i >= 100)
```

```
            break;
```

```
    }
```

```

printf("cosx -> %f\n", result);

result=1, sum = 1;
i = 0;

while ( sum > accuracy || sum < 0 )
{
    result += sum;
    i += 1;
    sum *= pow(((float)1/i),i);

    if (i >= 100)
        break;
}

printf("SUM -> %f\n", result);
}

```

```

~/Desktop/lab/ansi-c-balagurusamy-exercise/solutions/sharafat/7
> cl 11.c
compiling 11
  0.11s user 0.03s system 90% cpu 0.150 total

0.5
sinx → 1.479426
cosx → 1.877582
SUM → 3.259259

```

4) Present value

```
#include <math.h>
```

```
#include <stdio.h>
```

```
#include <ctype.h>
```

```
int input(char name)
```

```
{  
    int n;  
    printf("Enter the value of %c\n", name );  
    scanf("%d", &n);  
    if (n >= 0)  
        return n;  
    else  
    {  
        printf("Invalid input! Please try again\n");  
        printf("Value of P is -> %d", n);  
        return input(name);  
    }  
}
```

```
int main()
```

```
{  
    int n, c, d;  
    c = input('c');  
    d = input('d');  
    n = input('n');  
  
    int P;  
    P = c * pow(( 1 - (int)(d/100) ), n);  
    printf("Value of P is -> %d", P);  
  
    return 0;  
}
```

```
~/Desktop/lab/ansi-c-balagurusamy-exercise/solutions/sharafat/7 11s
```

```
> cl 12.c
```

```
compiling 12
```

```
0.12s user 0.03s system 98% cpu 0.153 total
```

```
Enter the value of c
```

```
5
```

```
Enter the value of d
```

```
6
```

```
Enter the value of n
```

```
1
```

```
Value of P is → 5%
```


5) Square of character S

```
#include<stdio.h>
```

```
int main()
```

```
{
```

```
    int i, j;
```

```
    int col = 5;
```

```
    char Char = 'S';
```

```
    for (i=0; i< col; i++)
```

```
    {
```

```
        for (j=0; j<col; j++)
```

```
        {
```

```
            printf("%c ", Char);
```

```
        }
```

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

```
    }
```

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

```
    for (i=0; i< col; i++)
```

```
    {
```

```
        for (j=0; j<col; j++)
```

```
        {
```

```
            if (i==0 | |j==0 | |i==col-1 | |j==col-1)
```

```
                printf("%c ", Char);
```

```
            else
```

```
                printf(" ");
```

```
        }
```

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

```
    }
```

```
}
```

~/Desktop/lab/ansi-c-balagurusamy-exercise/solutions/sharafat/7 11s

> cl 13.c

compiling 13

0.06s user 0.02s system 95% cpu 0.078 total

S S S S S

S S S S S

S S S S S

S S S S S

S S S S S

S S S S S

S S S S S

S S S S S

S S S S S

S S S S S

6) sin(x) graph function

```
#include <stdio.h>
```

```
#include <math.h>
```

```
/*
```

```
x      y
```

```
-----
```

```
0      0.000000
```

```
15     0.258819
```

```
30     0.500000
```

```
45     0.707107
```

```
60     0.866025
```

```
75     0.965926
```

```
90     1.000000
```

```
105    0.965926
```

```
120    0.866025
```

```
135    0.707107
```

```
150    0.500000
```

```
165    0.258819
```

```
180    0.000000
```

```
*/
```

```
#define PI 3.14159265
```

```
int main()
```

```
{
```

```
    int i;
```

```
    float j, s;
```

```
    for (j=1.1; j >= 0; j-=0.1)
```

```
    {
```

```
        for (i=0; i<= 180; i+= 15)
```

```
        {
```

```
            s = sin(i*PI/180);
```

```
            if (fabsf(s-j)<=0.1)
```

```
            {
```

```
                printf("*");
```

```
            }
```

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

```
~/Desktop/lab/ansi-c-balagurusamy-exercise/solutions/sharafat/7  
> cl 14.c  
compiling 14  
0.12s user 0.03s system 87% cpu 0.167 total
```

```
    ***  
   ** **  
  **  **  
 *    *  
*      *  
*      *  
  
*      *  
*      *  
*      *
```

7) S square with middle O

```
#include<stdio.h>
```

```
int main()
{
    int i, j;
    int col = 5;
    char Char = 'S';
    char Char2 = 'O';

    for (i=0; i< col; i++)
    {
        for (j=0; j<col; j++)
        {
            if (i==j && i==2)
                printf("%c ", Char2);
            else
                printf("%c ", Char);
        }
        printf("\n");
    }
}
```

```
~/Desktop/lab/ansi-c-balagurusamy-exercise/solutions/sharafat/7
> cl 15.c
compiling 15
  0.05s user 0.02s system 98% cpu 0.067 total

S S S S S
S S S S S
S S O S S
S S S S S
S S S S S
```

8) postivie values

```
#include<stdio.h>

int main()
{
    int i, j;
    int sum=0;

    for (i=0; i< 10; i++)
    {
        scanf("%d", &j);
        sum += j;
        printf("%d + ", j);
    }
    printf("\nSum -> %d", sum);
}

// test case
// 1 2 3 4 5 6 7 8 9 10
```

```
~/Desktop/lab/ansi-c-balagurusamy-exercise/solutions/sharafat/7 16s
> cl 16.c
compiling 16
  0.04s user 0.02s system 98% cpu 0.062 total

1 2 3 4 5 6 7 8 9 10
1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10 +
Sum → 55%
```

9) Colored line

```
#include <stdio.h>

void red () {
    printf("\033[1;31m");
}

void yellow() {
    printf("\033[1;33m");
}

void reset () {
    printf("\033[0m");
}

int main () {
    red();
    printf("Hello ");
    yellow();
    printf("world\n");
    red();
    printf("-----\n");
    reset();
    return 0;
}
```

```
~/Desktop/lab/ansi-c-balagurusamy-exercise/solutions/sharafat/7
> cl 17.c
compiling 17
  0.04s user 0.03s system 97% cpu 0.073 total

Hello world
```

10) Pattern pyramid center aligned

```
#include<stdio.h>
```

```
int main()
{
    int i, j;
    int digit=1;
    char letter='A';
    int n;
    scanf("%d", &n);

    for (i=0; i< n; i++)
    {
        for (j=0; j<(5-i);j++)
            printf(" ");
        for (j=0; j<= i; j++)
        {
            if (i%2==0)
                printf("%d ", digit++);
            else
                printf("%c ", letter++);
        }
        printf("\n");
    }
}
```



```
~/Desktop/lab/ansi-c-balagurusamy-exercise/solutions/sharafat/7
```

```
> cl 18.c
```

```
compiling 18
```

```
0.05s user 0.02s system 91% cpu 0.070 total
```

```
6
```

```
1
```

```
A B
```

```
2 3 4
```

```
C D E F
```

```
5 6 7 8 9
```

```
G H I J K L
```

11) Pattern of floating island

```
#include<stdio.h>
```

```
int main()
{
    int i, j;
    int digit=1;
    char letter='A';
    int n;
    scanf("%d", &n);

    for (i=0; i< n/2; i++)
    {
        for (j=0; j<(5-i);j++)
            printf(" ");
        for (j=1; j<= i+1; j++)
            printf("%d ", j);
        for (j=j-2;j>=1;j--)
            printf("%d ", j);
        printf("\n");
    }

    for (i=n/2; i>= 0; i--)
    {
        for (j=0; j<(5-i);j++)
            printf(" ");
        for (j=1; j<= i+1; j++)
            printf("%d ", j);
        for (j=j-2;j>=1;j--)
            printf("%d ", j);
        printf("\n");
    }
}
```

```
~/Desktop/lab/ansi-c-balagurusamy-exercise/solutions/sharafat/7
```

```
> cl 18.c
```

```
compiling 18
```

```
0.05s user 0.02s system 95% cpu 0.071 total
```

```
5
```

```
1
```

```
A B
```

```
2 3 4
```

```
C D E F
```

```
5 6 7 8 9
```

12) Sum of the digits

```
#include<stdio.h>
int main()
{
    int n;
    scanf("%d", &n);

    int sum=0;
    while (n>0)
    {
        sum += n % 10;
        n /= 10;
    }
    printf("%d", sum);
}
```

~/Desktop/lab/ansi-c-balagurusamy-exercise/solutions/sharafat/7 13s

> **cl** 2.c

compiling 2

0.06s user 0.02s system 97% cpu 0.090 total

521

8%

13) left sided pattern

```
#include<stdio.h>
```

```
int main()
{
    int i, j;
    int digit=1;
    char letter='A';
    int n;
    scanf("%d", &n);

    for (i=0; i< n; i++)
    {
        for (j=0; j<= i; j++)
            printf("%d ", ((i+j)%2==0?1:0));
        printf("\n");
    }
}
```

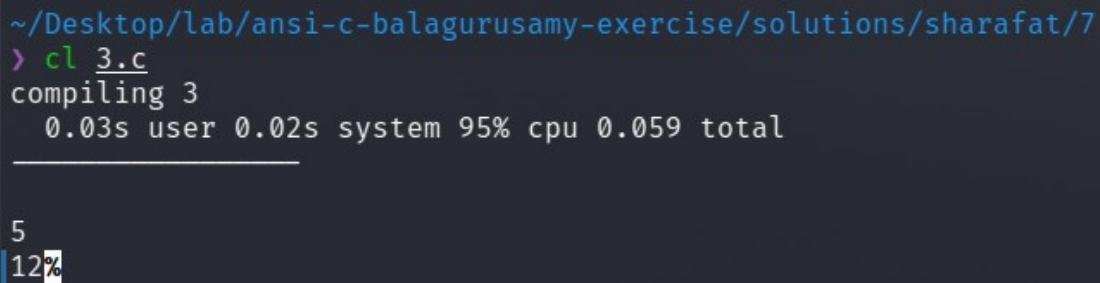
```
~/Desktop/lab/ansi-c-balagurusamy-exercise/solutions/sharafat/7
> cl 20.c
compiling 20
0.05s user 0.01s system 87% cpu 0.072 total

5
1
0 1
1 0 1
0 1 0 1
1 0 1 0 1
```

14) Fibonacci numbers

```
#include<stdio.h>
int main()
{
    int n;
    scanf("%d", &n);

    int i=0, j=1, k=1, l=0, sum=0;
    do
    {
        if ( i == 0 || i == 1 )
            sum += 1;
        else
        {
            sum += j + k;
            l = j + k;
            k = j;
            j = l;
        }
        i++;
    } while (i<n);
    printf("%d", sum);
}
```



A terminal window with a dark background. The prompt is a blue tilde followed by the path `~/Desktop/lab/ansi-c-balagurusamy-exercise/solutions/sharafat/7`. The user enters `> cl 3.c` in green. The output shows `compiling 3` and `0.03s user 0.02s system 95% cpu 0.059 total`. A horizontal line is drawn. Below it, the number `5` is printed. At the bottom left, `12%` is shown next to a vertical bar.

```
~/Desktop/lab/ansi-c-balagurusamy-exercise/solutions/sharafat/7
> cl 3.c
compiling 3
  0.03s user 0.02s system 95% cpu 0.059 total
_____
5
12%
```

15) Investment equation

```
#include<stdio.h>
int main()
{
    int n=1;
    int p=1000, V ; float r=0.10;
    do
    {
        V = p * (1+r);
        printf("P - %d , V - %d , n - %d \n", p, V, n++);
        p = V;
    } while ( p <= 10000 );
}
```

```
~/Desktop/lab/ansi-c-balagurusamy-exercise/solutions/sharafat/7
```

```
> cl 4.c
```

```
compiling 4
```

```
0.06s user 0.02s system 95% cpu 0.086 total
```

```
P - 1000 , V - 1100 , n - 1
P - 1100 , V - 1210 , n - 2
P - 1210 , V - 1331 , n - 3
P - 1331 , V - 1464 , n - 4
P - 1464 , V - 1610 , n - 5
P - 1610 , V - 1771 , n - 6
P - 1771 , V - 1948 , n - 7
P - 1948 , V - 2142 , n - 8
P - 2142 , V - 2356 , n - 9
P - 2356 , V - 2591 , n - 10
P - 2591 , V - 2850 , n - 11
P - 2850 , V - 3135 , n - 12
P - 3135 , V - 3448 , n - 13
P - 3448 , V - 3792 , n - 14
P - 3792 , V - 4171 , n - 15
P - 4171 , V - 4588 , n - 16
P - 4588 , V - 5046 , n - 17
P - 5046 , V - 5550 , n - 18
P - 5550 , V - 6105 , n - 19
P - 6105 , V - 6715 , n - 20
P - 6715 , V - 7386 , n - 21
P - 7386 , V - 8124 , n - 22
P - 8124 , V - 8936 , n - 23
P - 8936 , V - 9829 , n - 24
P - 9829 , V - 10811 , n - 25
```


16) pattern with for loop

```
#include <stdio.h>
```

```
int main()
```

```
{
```

```
    int n;
```

```
    scanf("%d", &n);
```

```
    int i, j;
```

```
    for (i=0; i<n; i++)
```

```
    {
```

```
        for (j=1; j<=i+1; j++)
```

```
            printf("%d ", i+1);
```

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

```
    }
```

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

```
    for (i=0; i<n; i++)
```

```
    {
```

```
        for (j=0; j<i; j++)
```

```
            printf(" ");
```

```
        for ( j=n-i ; j>0 ; j-- )
```

```
            printf("* ");
```

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

```
    }
```

```
}
```

```
/Desktop/lab/ansi-c-batagurusamy-exercise/solutions/sharad/7
```

```
> cl 5.c
```

```
compiling 5
```

```
0.04s user 0.02s system 93% cpu 0.064 total
```

```
9
```

```
1
```

```
2 2
```

```
3 3 3
```

```
4 4 4 4
```

```
5 5 5 5 5
```

```
6 6 6 6 6 6
```

```
7 7 7 7 7 7 7
```

```
8 8 8 8 8 8 8 8
```

```
9 9 9 9 9 9 9 9 9
```

```
* * * * *
```

```
* * * * *
```

```
* * * * *
```

```
* * * * *
```

```
* * * * *
```

```
* * * *
```

```
* * *
```

```
* *
```

```
*
```

17) Age range

```
#include<stdio.h>
```

```
int main()
{
    int i, j;
    int sum = 0;

    for (i=0; i<100; i++)
    {
        scanf("%d", &j);
        if ( 50 <= j && j <= 60 )
        {
            sum++;
            continue;
        }
    }
    printf("total - %d", sum);
}
```

```
// test cases
```

```
// 84 29 50 5 96 36 47 77 16 30 39 79 63 40 19 76 42 57 97 48 69 24 98 55 73 3 25 60
92 46 26 44 23 95 65 45 15 59 62 51 85 20 71 87 31 4 8 66 99 7 54 89 37 6 70 1 56 81
75 90 2 17 28 88 14 11 82 18 94 13 49 22 61 9 10 21 64 32 91 67 58 33 93 38 83 34 12
41 78 72 27 74 80 43 68 86 35 100 53 52
```

```
~/Desktop/lab/ansi-c-balagurusamy-exercise/solutions/sharafat/7
```

```
> cl 6.c
```

```
compiling 6
```

```
0.07s user 0.02s system 96% cpu 0.098 total
```

```
84 29 50 5 96 36 47 77 16 30 39 79 63 40 19 76 42 57 97 48 69 24 98 55 7
3 25 60 92 46 26 44 23 95 65 45 15 59 62 51 85 20 71 87 31 4 8 66 99 7
4 89 37 6 70 1 56 81 75 90 2 17 28 88 14 11 82 18 94 13 49 22 61 9 10 21
64 32 91 67 58 33 93 38 83 34 12 41 78 72 27 74 80 43 68 86 35 100 53 52
total - 11%
```

18) 2 curves

```
#include<stdio.h>
#include <math.h>
int main()
{
    int i;
    float a, x, y1, y2;
    a = 0.4;
    printf("      y ----->      \n");
    printf("-----\n");
    for (x=0; x<5; x= x + 0.25)
    {
        y1 = (int) (50*exp(-a * x)+0.5);
        y2 = (int) (50*exp(-a * x + x/2)+0.5);
        if (y1 == y2)
        {
            if (x==2.5)
                printf(" X |");
            else
                printf(" |");
            for (i=1; i <= y1-1; ++i)
                printf(" ");
            printf("#\n");
            continue;
        }
        if (y1>y2)
        {
            if ( x == 2.5 )
                printf(" X |");
            else
                printf("  |");
            for (i=1; i <= y2-1; ++i )
                printf(" ");
            printf("*");
            for ( i = 1; i <= (y1 - y2-1);++i)
                printf("-");
```

```

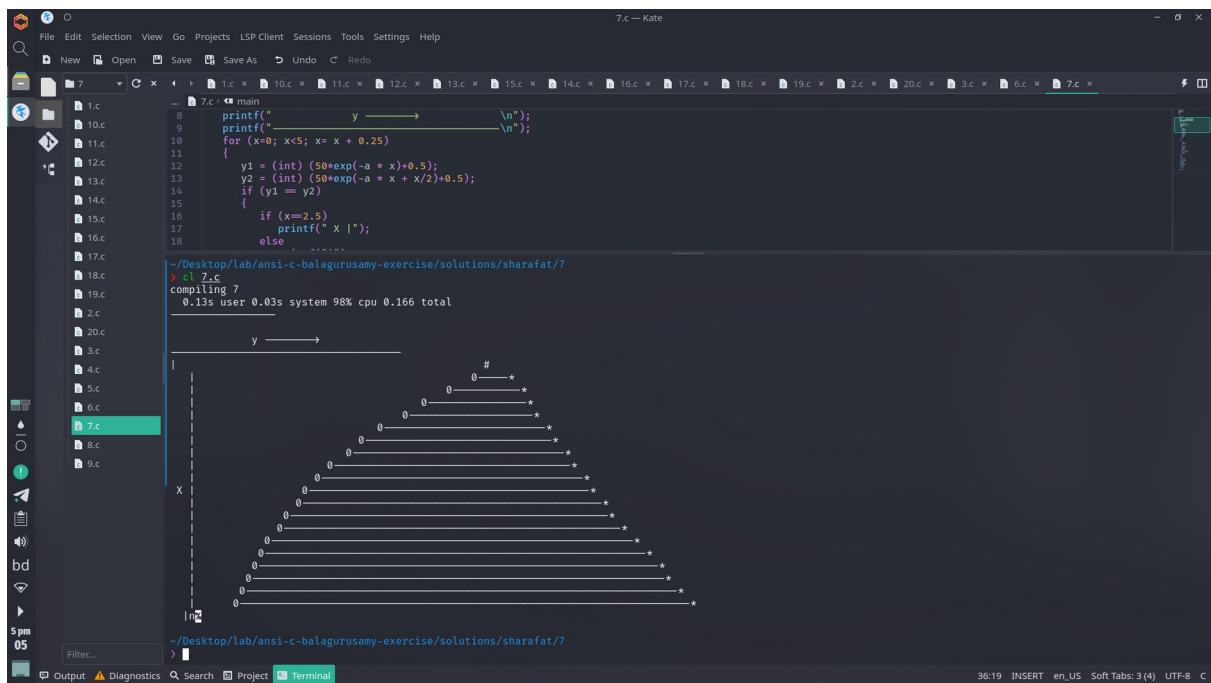
        continue;
    }
    if (x==2.5)
        printf(" X |");
    else
        printf("  |");
    for (i = 1; i <= (y1 - 1); ++i)
        printf(" ");
    printf("0");
    for (i = 1; i <= (y2-y1-1); ++i)
        printf("-");
    printf("*\n");
}
printf(" |n");

```

```

float j, s;
for (j=1.1; j >= 0; j-=0.1)
{
    for (i=0; i<= 5; i+= 0.5)
    {
        s = exp(-a * x);
        if (fabsf(s-j)<=0.1)
        {
            printf("*");
        }
        else {
            printf(" ");
        }
    }
    printf("\n");
}
}

```



19) exponent table

```
#include<stdio.h>
#include <math.h>

int main()
{
    float x, y;
    x = 0.0;

    float i, j;
    for (i=0; i<= (float)(0.91) ; i += 0.1)
    {
        if (i==0)
            printf("  X  ");
        else
            printf("  %.1f  ", i);
    }
    printf("\n");

    for (i=0; i<= 9 ; i += 1)
    {
        for (j=i; j<=i+0.91; j += 0.1)
        {
            if (j==i)
                printf("  %.1f ", j);
            else
                printf("  %.1e ", exp(-j));
        }
        printf("\n");
    }
    printf("\n");
}
```



```
~/Desktop/lab/ansi-c-balagurusamy-exercise/solutions/sharafat/7
```

```
> cl 8.c
```

```
compiling 8
```

```
0.14s user 0.02s system 97% cpu 0.164 total
```

X	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
0.0	9.0e-01	8.2e-01	7.4e-01	6.7e-01	6.1e-01	5.5e-01	5.0e-01	4.5e-01	4.1e-01
1.0	3.3e-01	3.0e-01	2.7e-01	2.5e-01	2.2e-01	2.0e-01	1.8e-01	1.7e-01	1.5e-01
2.0	1.2e-01	1.1e-01	1.0e-01	9.1e-02	8.2e-02	7.4e-02	6.7e-02	6.1e-02	5.5e-02
3.0	4.5e-02	4.1e-02	3.7e-02	3.3e-02	3.0e-02	2.7e-02	2.5e-02	2.2e-02	2.0e-02
4.0	1.7e-02	1.5e-02	1.4e-02	1.2e-02	1.1e-02	1.0e-02	9.1e-03	8.2e-03	7.4e-03
5.0	6.1e-03	5.5e-03	5.0e-03	4.5e-03	4.1e-03	3.7e-03	3.3e-03	3.0e-03	2.7e-03
6.0	2.2e-03	2.0e-03	1.8e-03	1.7e-03	1.5e-03	1.4e-03	1.2e-03	1.1e-03	1.0e-03
7.0	8.3e-04	7.5e-04	6.8e-04	6.1e-04	5.5e-04	5.0e-04	4.5e-04	4.1e-04	3.7e-04
8.0	3.0e-04	2.7e-04	2.5e-04	2.2e-04	2.0e-04	1.8e-04	1.7e-04	1.5e-04	1.4e-04
9.0	1.1e-04	1.0e-04	9.1e-05	8.3e-05	7.5e-05	6.8e-05	6.1e-05	5.5e-05	5.0e-05

20) S writing with loop

```
#include <stdio.h>
```

```
int main() {
    int rows = 15;
    int cols = 18;
    int i, j;

    for (i = 0; i < cols; i++)
        printf("*");
    printf("\n");

    for (i = 0; i < cols; i++)
    {
        if (i < 2 || i > 15)
            printf("*");
        else
            printf("-");
    }
    printf("\n");

    for (i = 0; i < cols; i++)
    {
        if (i < 9 || i > 15)
            printf("*");
        else
            printf("-");
    }
    printf("\n");

    for (i = 0; i < cols; i++)
    {
        if (i < 4 )
            printf("*");
    }
    printf("\n");
}
```

```
for (i = 0; i < cols; i++)
{
    if (i < 4 )
        printf("*");
}
printf("\n");
```

```
for (i = 0; i < cols; i++)
{
    if (i < 4 )
        printf("*");
}
printf("\n");
```

```
for (i = 0; i < cols; i++)
{
    if (i < 5 || i > 13)
        printf("*");
    else
        printf("-");
}
printf("\n");
```

```
for (i = 0; i < cols; i++)
{
    if (i > 13)
        printf("*");
    else
        printf("-");
}
printf("\n");
```

```
for (i = 0; i < cols; i++)
{
    if (i > 13)
        printf("*");
```

```
        else
            printf("-");
    }
    printf("\n");
    for (i = 0; i < cols; i++)
    {
        if (i > 13)
            printf("*");
        else
            printf("-");
    }
    printf("\n");
    for (i = 0; i < cols; i++)
    {
        if (i > 13)
            printf("*");
        else
            printf("-");
    }
    printf("\n");
    for (i = 0; i < cols; i++)
    {
        if (i > 13)
            printf("*");
        else
            printf("-");
    }
    printf("\n");
    for (i = 0; i < cols; i++)
    {
        if (i > 13)
            printf("*");
        else
            printf("-");
    }
    printf("\n");
```

```
for (i = 0; i < cols; i++)
{
    if (i < 4 || i > 13)
        printf("*");
    else
        printf("-");
}
printf("\n");

for (i = 0; i < cols; i++)
{
    if (i < 3 || i > 13)
        printf("*");
    else
        printf("-");
}
printf("\n");

for (i = 0; i < cols; i++)
{
    if (i < 2 || i > 13)
        printf("*");
    else
        printf("-");
}
printf("\n");

return 0;
}
```

```
~/Desktop/lab/ansi-c-balagurusamy-exercise/solutions/sharafat/7
```

```
> cl 9.c
```

```
compiling 9
```

```
0.07s user 0.03s system 80% cpu 0.113 total
```

```
*****
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