

* Who is the inventor of C programming Language?

Dennis Ritchie.

* Which programming language more faster

Assembly

■ check the output.

```
int main() {  
    int a = 10 / 3;  
    printf ("%d", a);  
    return 0;  
}
```

Output

3. 33

3. 0

3

0

Ans: If we run the program "main.c" file.

```
int main()  
{  
    int a = 10; // 15.0 "ts.F4"  
    int b = 5 ← C2  
    int c = a + b;  
    printf ("%d", c);  
    return 0; }
```

Output: for a "

15

10 + 5

Syntax Error

Data types, variable, constants

Definition of computer program.

A computer program is a sequence of instruction

story → paragraph → sentence

program → Function → statement

⊗⊗⊗ return 0;

মন্তব্য করতে এবং return 0 দ্বারা সমাপ্ত করা।
কোন value দ্বারা প্রাপ্ত কোন মুক্তি হবে নেই।

⊗⊗⊗ printf এর জন্য double and float এর ক্ষেত্রে

• %f "10.2f" দ্বারা নম্বিক দ্বারা ক্ষেত্রে 2 পর্যায় 3.14

"%.10f" "3.1415926535" এর জন্য অন্তর্ভুক্ত করা। -- 3.141600

"%7.2f" "0.12" " " " 7 ক্ষেত্রে 2 ফল 0.12 = 0.12

"%.3.4f" "0.123456789" " " " 3.4 ক্ষেত্রে 3 ফল 0.123 = 0.123

↓
সিমিলার ও স্ট্রিং এর ক্ষেত্রে একে সমাধান করা হচ্ছে।

⊗ int main () {

float n = 3.1416; ← ;(n, "3.1416")

printf ("%.10f", n);

return 0;

}

⊗ Naming convention

1) a-z, A-Z, 0-9, (-) under-score.

2. First character must be a letter or underscore

Digit अमर्त्य सं,

e.g. n = root n

⊗ ⊗ ⊗

5/3 → 1 ← ;(n, "1", "1") third arg

5.0/3 → 1.6666666666666665 ← ;(n, "1.6666666666666665", "2") third arg

5/3.0 → 1.6666666666666665 ← ;(n, "1.6666666666666665", "2") third arg

5.0/3.0 → 1.6666666666666665 ← ;(n, "1.6666666666666665", "2") third arg

⊗ ⊗ ⊗

float n = (5/3) = 1

printf ("%f", n); → 1.000000

~~⊗⊗⊗~~ int $n = \lfloor 5.0 / 3 \rfloor; 1.66\ldots$ } (i) divisor float

printf ("%d", n); $\rightarrow 1$ (P1.8 = n. float)
(x, "float") taking

~~⊗⊗⊗~~ float $n = (\text{float}) 5 / 3;$ ^{no round}
printf ("%f", n); $\rightarrow 1.666\ldots$

~~⊗~~ float $n = (\text{float}) (5 / 3);$

printf ("%f", n); $\rightarrow 1.000\ldots$

~~⊗~~ round / ceil / floor

int floor $n = 2.3;$ the same tipib কর্তৃত

printf ("%f", ceil(n)); $\rightarrow 3.000\ldots$

printf ("%f", floor(n)); $\rightarrow 2.000\ldots$

printf ("%f", round(n)); $\rightarrow 2.000\ldots$

round কার্যক্রম

000000.1 $\leftarrow (n, 6)$ taking

② character input ASCII value output

```
#include <stdio.h>
int main()
{
    char n;
    scanf("%c", &n);
    printf("%d", n);
    return 0;
}
```

A → F 65

B → 66

③ character input একাধিক character output

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

```
int main()
{
    char n;
```

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

```
int y = n
```

```
printf("%c", (y - 1));
```

```
return 0;
```

i++ = 0

i++ = 1

i++ = 2

i++ = 3

i++ = 4

i++ = 5

i++ = 6

i++ = 7

i++ = 8

i++ = 9

i++ = 10

i++ = 11

i++ = 12

i++ = 13

i++ = 14

i++ = 15

i++ = 16

i++ = 17

i++ = 18

i++ = 19

i++ = 20

i++ = 21

i++ = 22

i++ = 23

i++ = 24

i++ = 25

i++ = 26

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i++ = 245

i++ = 246

i++ = 247

i++ = 248

i++ = 249

i++ = 250

i++ = 251

i++ = 252

i++ = 253

i++ = 254

i++ = 255

i++ = 256

i++ = 257

i++ = 258

Sequence of operators

$(\) \rightarrow * \rightarrow / \rightarrow \% \rightarrow + \rightarrow (-)$

fnq A C1) অসম কোর্স রেখ বাবু (remainder)

2) $7 \% 5 \rightarrow 2$

3) $\leftarrow 8$

4) Implement and Decrement

pre increment

post increment

$i = 5$

$a = ++i$

$\cancel{a = 6}$

$i = 6$

$a = 6$

$i = 5$

$a = i++$

$i = 6$

পুনর সৌর কোর্স মধ্যে
বাবু

পুনর সৌর কোর্স

সৌর কোর্স

$\leftarrow 1$

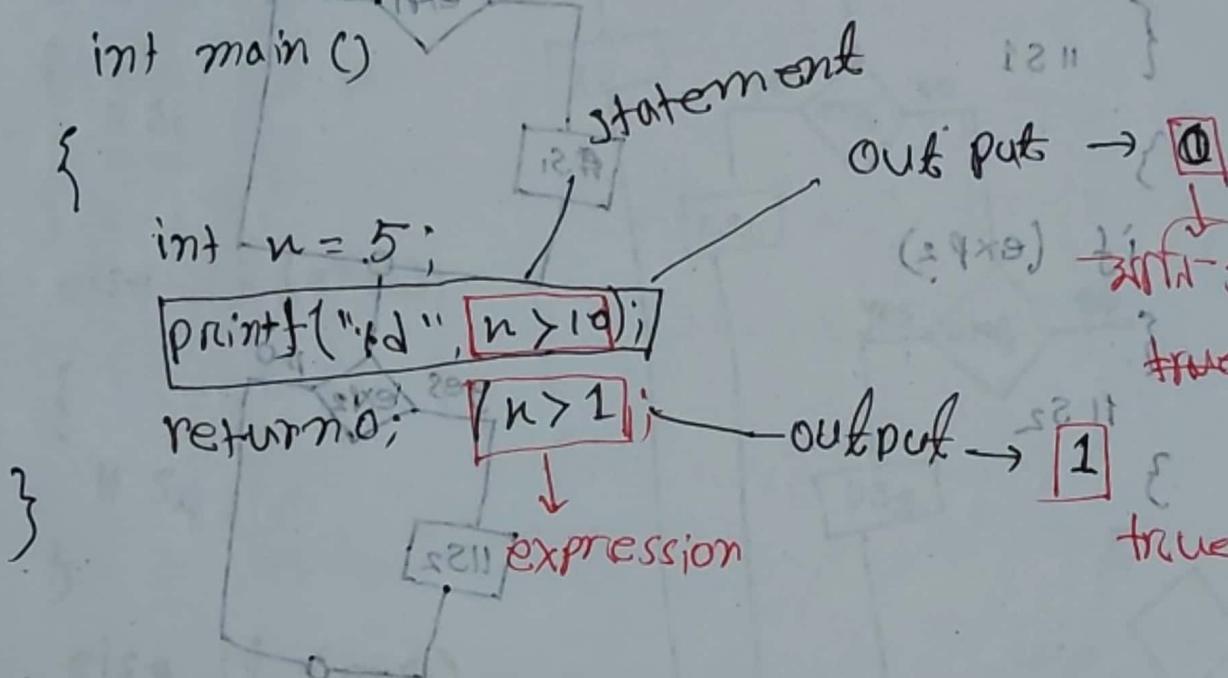
$n = n + i$

$((i - 1), "5x")$ তারিখ

o মুক্তি

□ statement if ... else

#include <stdio.h>



□ conditional statement

□ switch

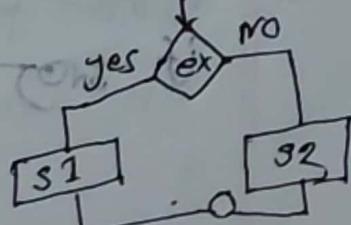
single if...else
sequential if
multi way if...else

single if...else

কোনো statement expression থাকবে

মত্ত হলে if এর পাশ থাকবে নিয়ে

হলে else হবে



sequential if

if (enp1)

1151

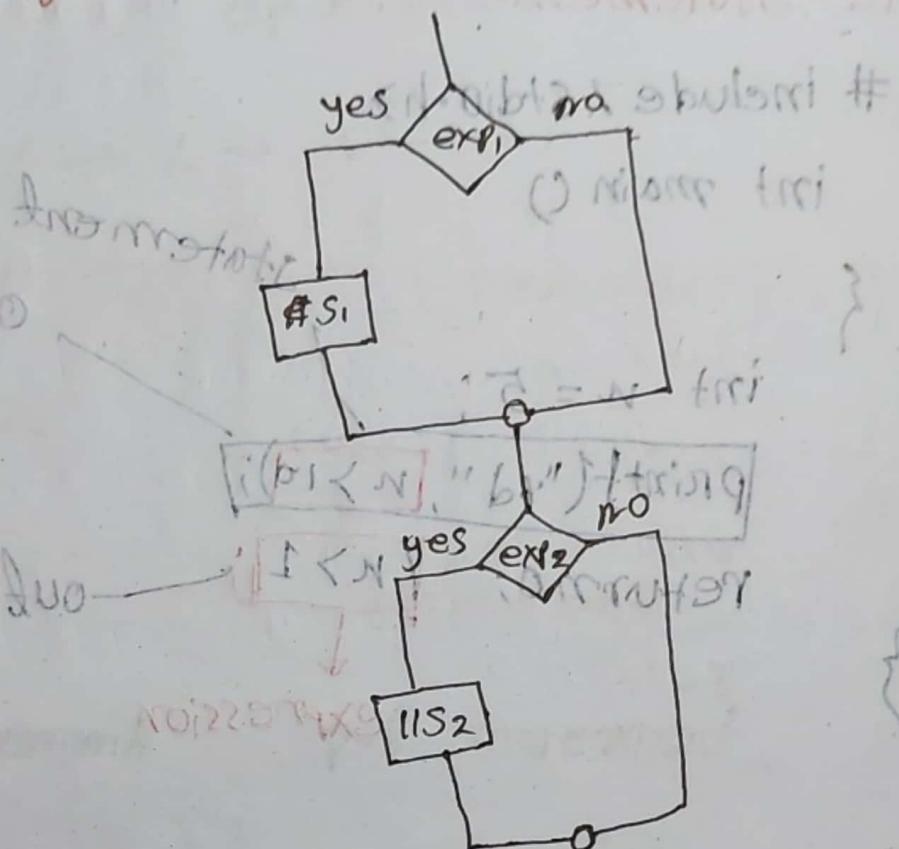
~~①~~ } ← step 210

if (exp2)

{

11 S₂

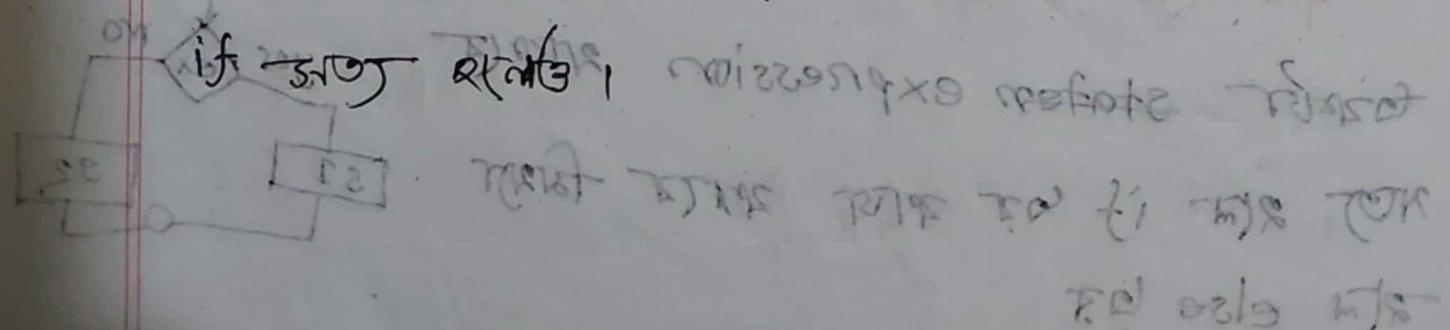
۷۰۸



એધારુ if zero રૂપાની flow chart કરો

water 22²²⁶ --- ti. sponie Notiwe □
20th if 20 25²⁵(?) flow chart to 2(?)
se...-ti pow ythum

କ୍ଷେତ୍ର ଫି ମିଶ୍ନ ଏଲ୍ଲାଟି ପଦବୀ ଫି ଥାର୍ଡ ଏଲ୍ଲାଟି



Multiway if...else

if (exp₁)

{
 || S₁
 bb0
}

} zero

else if (exp₂)

{
 || S₂

}

else if (exp₃)

{
 || S₃

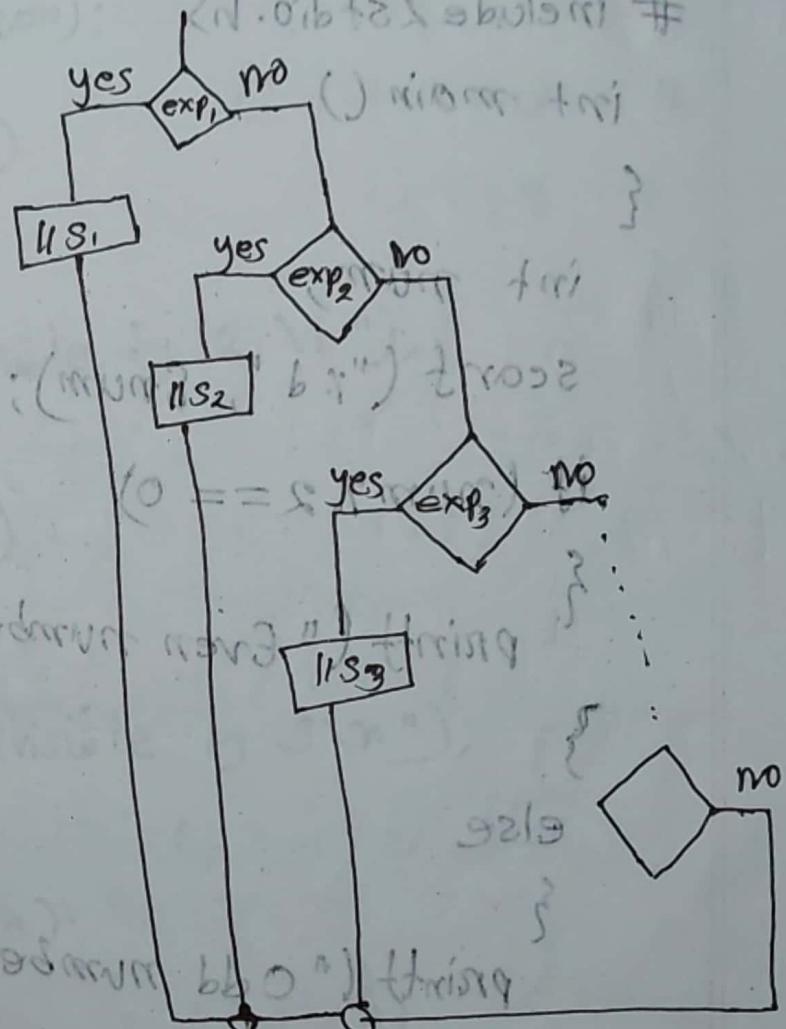
}

else

{

 || S_n

}



ଏହାରେ exp କଥର ମାତ୍ର କିମ୍ବା

ଏହାରେ exp କଥର କିମ୍ବା ନା...

Orion + set

remove for

problem 1

Even or odd number check

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

```
int main()
```

{

int num;

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

if (num % 2 == 0)

۸

```
printf ("Even number");
```

else

3

```
printf ("Odd number");
```

3

```
} return 0;
```

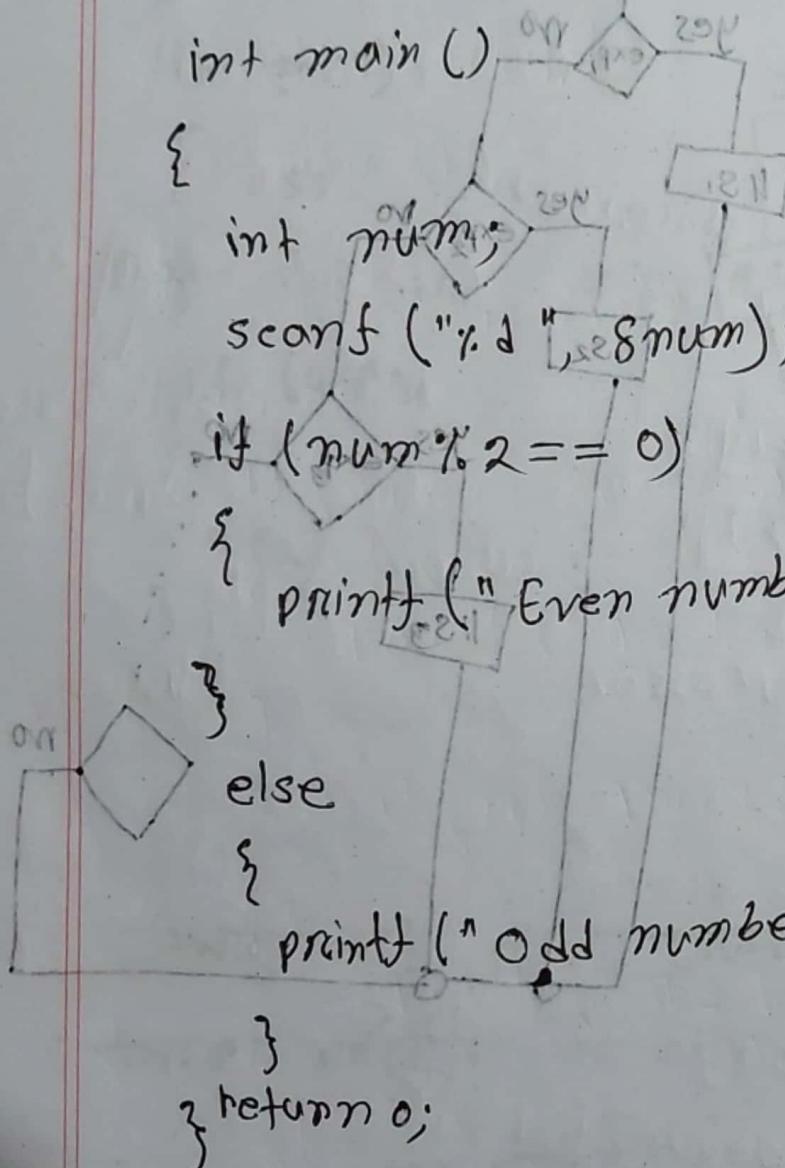
Divisible by 2, 3, 5

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

```
int main()
```

{

```
int num;
```



mpul

Output

5

odd

even

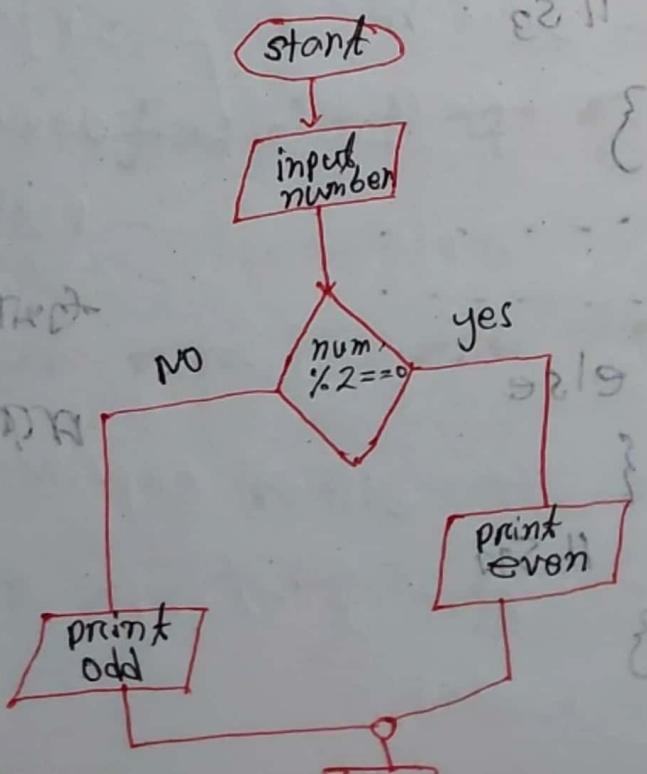
else if (e6x6)

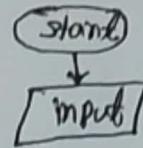
2

{

(84x9) 7/1 0219

Flowchart





scanf ("%d", &num);

if (num % 2 == 0)

{

printf ("Divisible by 2\n");

} if (num % 2 == 0) then

if (num % 3 == 0) {

{ printf ("Divisible by 3\n"); } else

if (num % 3 != 0) {

if (num % 5 == 0)

{

printf ("Divisible by 5\n"); }

} else {

return 0; } //input

}

Output

2, 5

3, 5

2, 3, 5

10

15

30

11

10, 20

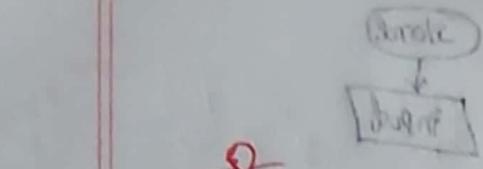
15, 30

7

8, 11

2

1, 2



problem

Find out the largest number among 3 numbers.

#include<stdio.h>

int main()

{

 int num1, num2, num3; //Declaring variables

 scanf ("%d %d %d", &num1, &num2, &num3);

 if (num1 > num2 && num1 > num3) //Condition

{

 printf ("The largest num: %d", num1);

}

 else if (num2 > num1 && num2 > num3)

{

 printf ("The largest num: %d", num2);

}

 else

{

 printf ("The largest number: %d", num3);

}

return 0;

}

Input Output

1 3 5

5

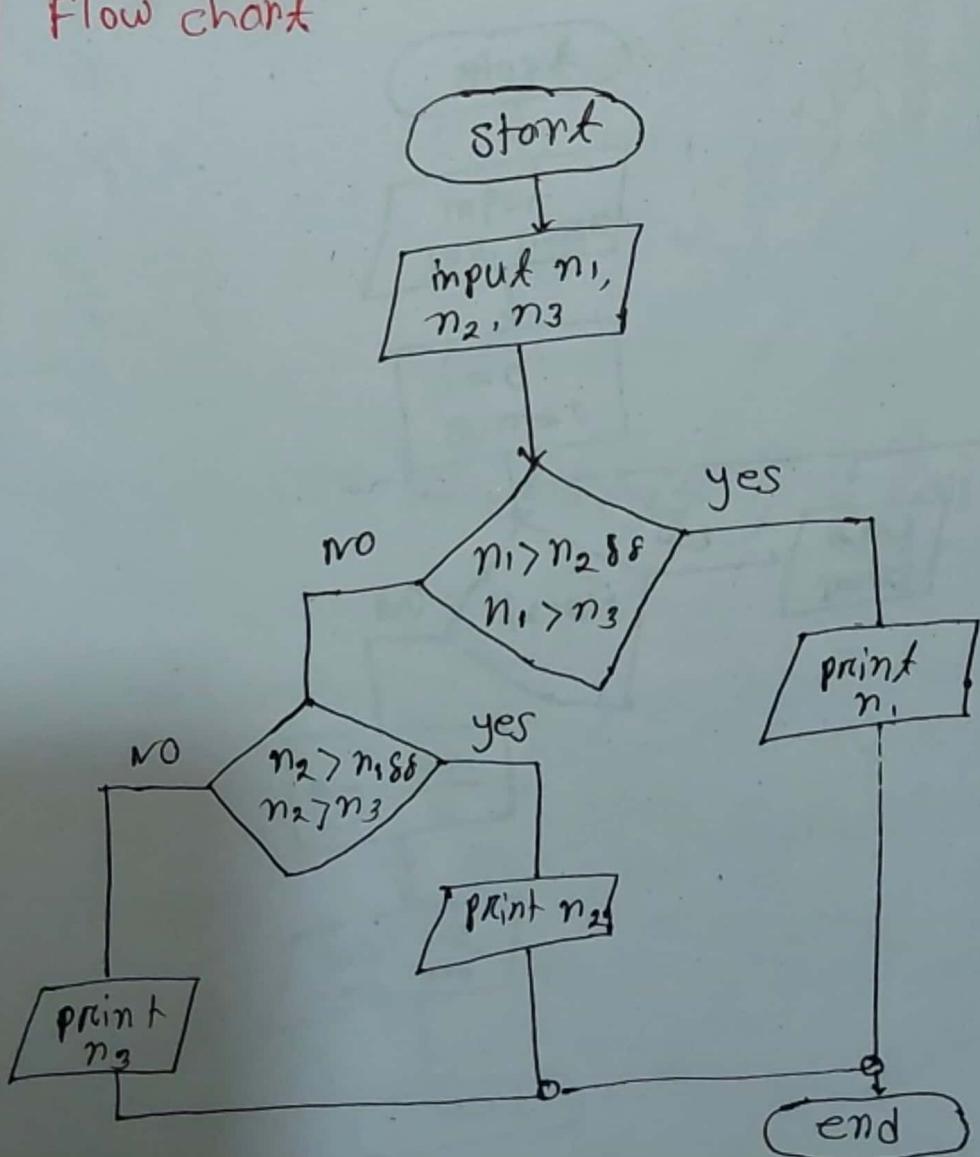
6 2 1

6

Pseudocode

- ① input num1, num2, num3.
- ② check the largest number.
- ③ print the largest number.

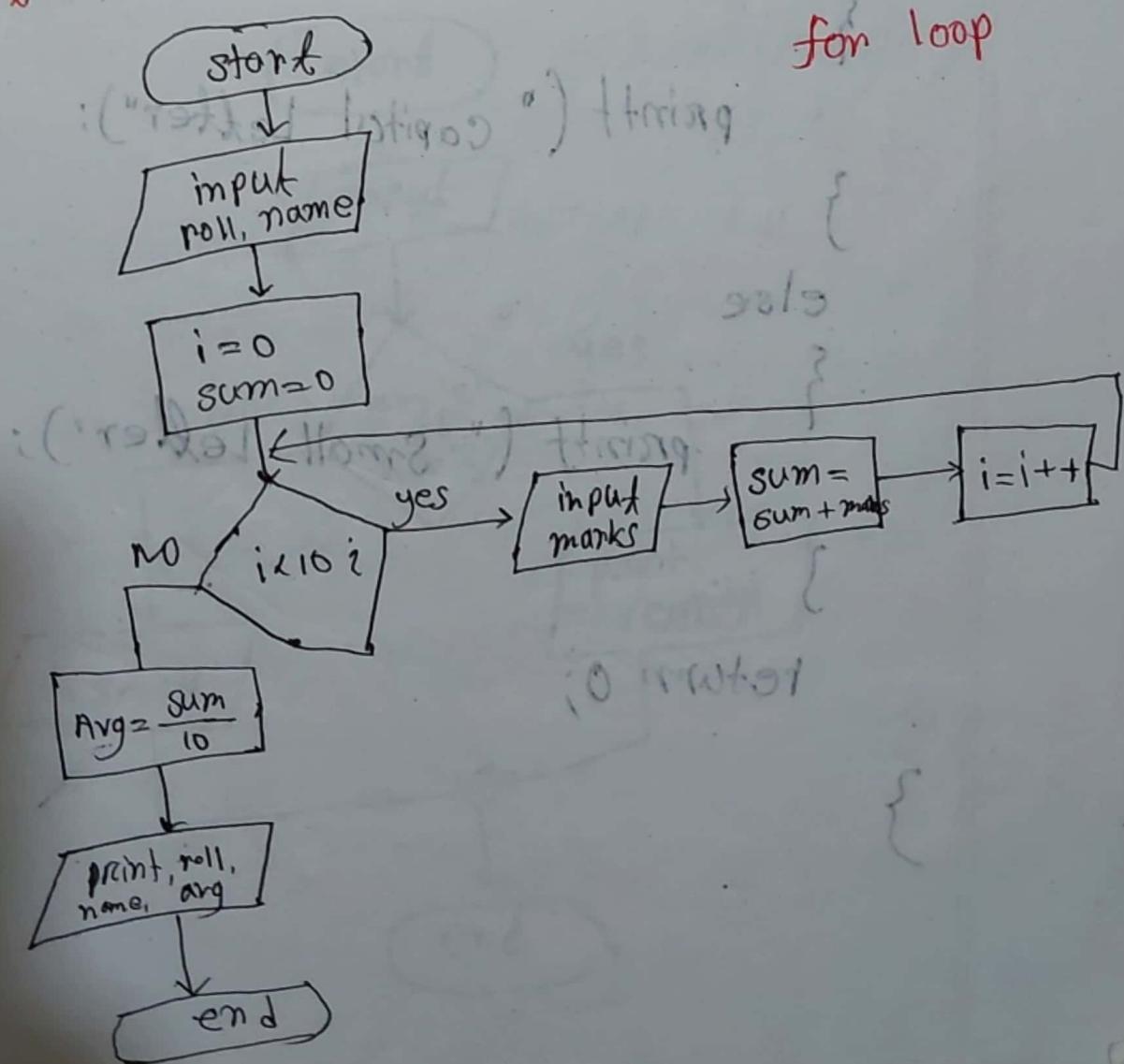
Flow chart



pseudocode

- ① int, roll, name;
- ② input marks of 10 subject;
- ③ calculate sum of 10 subject
- ④ calculate average
- ⑤ print roll, name, average.

Flowchart



problem
4

White a program input an English latter
check is capital or small.

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

```
int main()
```

```
{ int
```

```
char n;
```

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

```
if (n >= 'A' && n <= 'Z')
```

```
{
```

```
printf ("Capital Letter");
```

```
}
```

```
else
```

```
{
```

```
printf ("Small Letter");
```

```
}
```

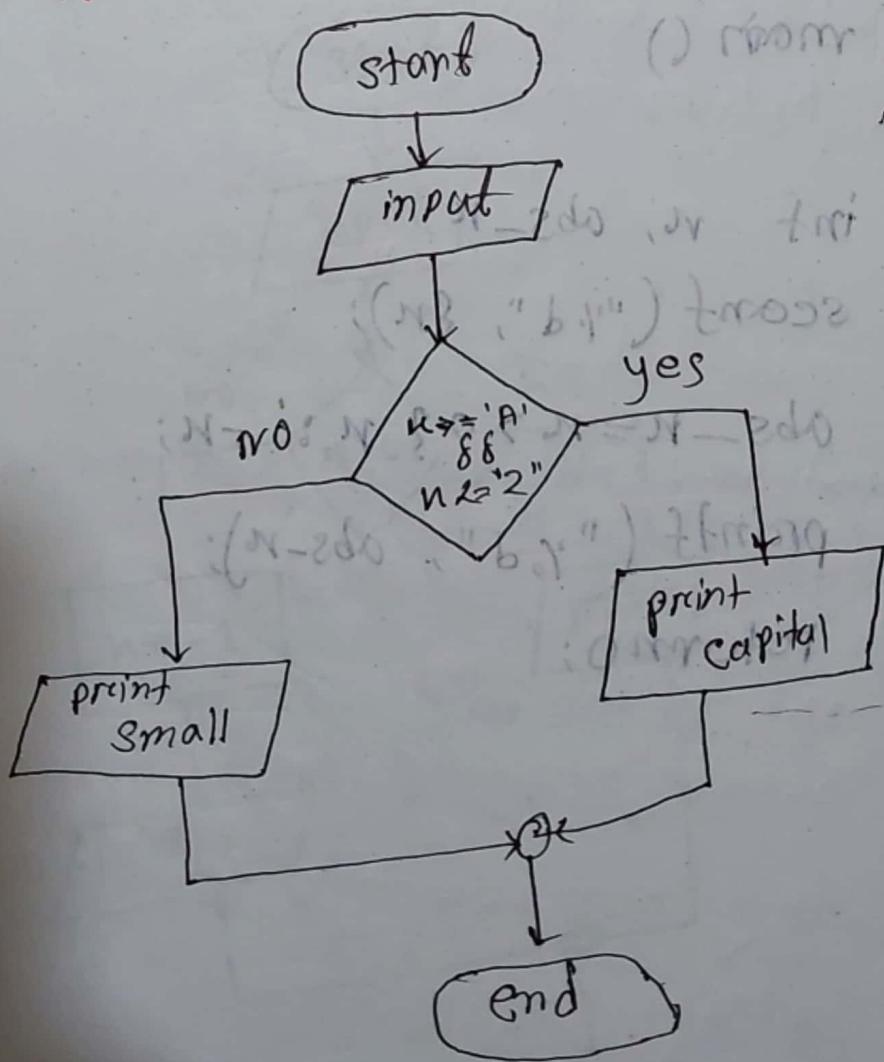
```
return 0;
```

```
}
```

Pseudocode

- ① char n;
- ② input an English letter
- ③ check the condition
- ④ print capital output

Flow chart



problem

5

Absolute value

Absolute value means
 $-3 = |-3| = 3$

Ternary operator

condition ? $\text{exp1} : \text{exp2}$

// write a program ↴

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

```
int main ()
```

```
{
```

```
    int n, abs_n;
```

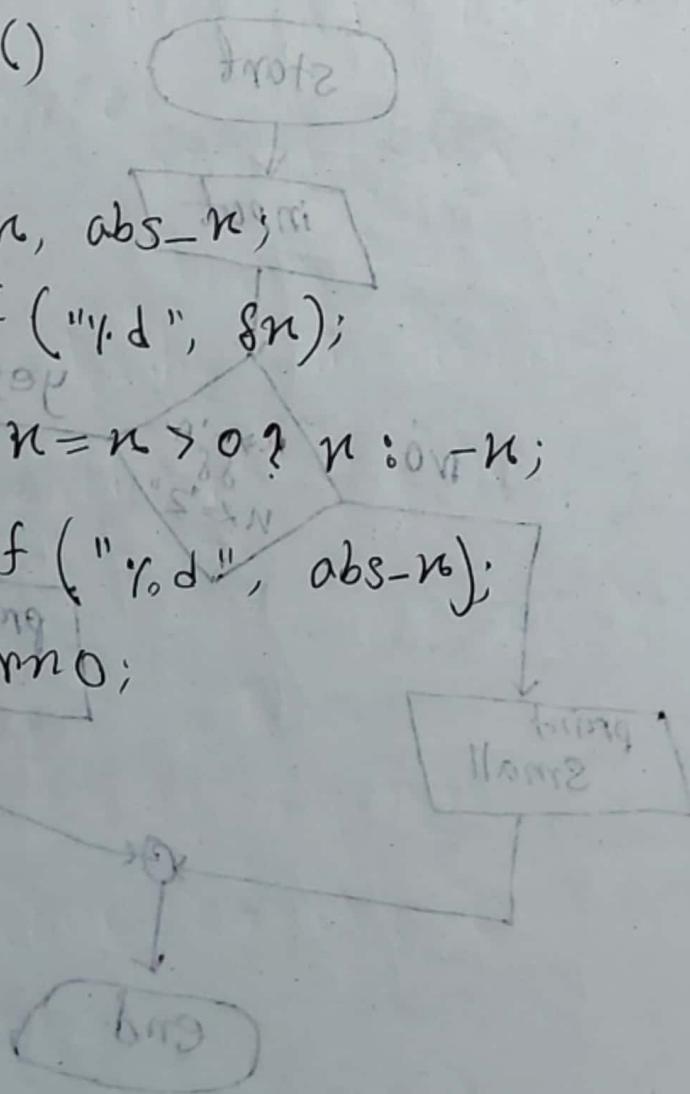
```
    scanf ("%d", &n);
```

```
    abs_n = n > 0 ? n : -n;
```

```
    printf ("%d", abs_n);
```

```
    return 0;
```

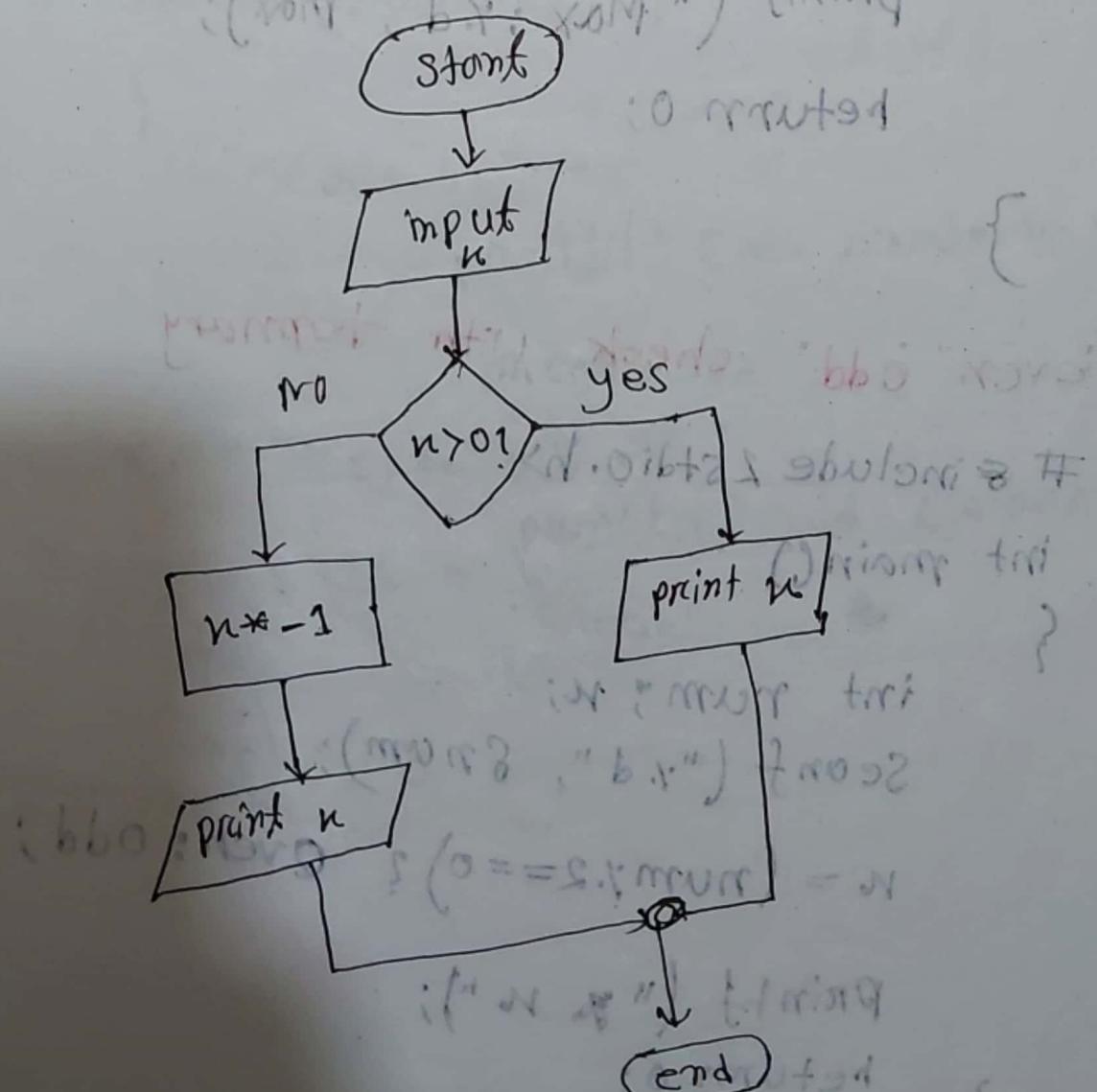
```
}
```



pseudocode

- ① int n; abs n;
- ② input n;
- ③ check condition
- ④ print out put

Flow chart



problem
6

Max number check for by ternary way

include <stdio.h>

int main()

{

int a, b, c, max;

scanf ("%d %d %d", &a, &b, &c);

max = a > b ? (a > c ? a : c) : (b > c ? b : c);

printf ("Max : %d", max);

return 0;

}

"even" odd" check with ternary

include <stdio.h>

int main()

{

int num, n;

scanf ("%d", &n);

n = (num % 2 == 0) ? even : odd;

printf ("%d", n);

return 0;

"even odd" check

By switch statement

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

```
int main()
```

```
{
```

```
    int num;
```

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

```
    switch (num % 2)
```

```
{
```

```
    case 0:
```

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

```
        break;
```

```
    case 1:
```

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

```
        break;
```

```
    return 0;
```

```
}
```

CS CamScanner

Demo

Input Output

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

```
int main()
```

```
{
```

```
    int num;
```

```
    scanf ("%d", &num)
```

```
    switch (num)
```

```
{
```

```
    case 0:
```

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

```
    case 1:
```

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

```
((num == 1) | break);
```

```
    case 2:
```

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

```
((num == 2) | break);
```

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

```
((num == 3) | break);
```

```
    default:
```

```
        printf ("See You.\n");
```

```
}
```

```
return 0;
```

```
}
```

input output

0 0 0 Hello

1 0 1 Hi

2 1 2 Bye

3 2 3 See You

4 3 4

5 4 5

6 5 6

7 6 7

8 7 8

9 8 9

10 9 10

11 10 11

12 11 12

13 12 13

14 13 14

15 14 15

16 15 16

17 16 17

18 17 18

19 18 19

20 19 20

21 20 21

22 21 22

23 22 23

24 23 24

25 24 25

26 25 26

27 26 27

problem
7

vowel check

```
# include <stdio.h>
int main()
{
    char n;
    scanf ("%c", &n);
    switch (toupper(n))
    {
        case 'A': case 'E':
        case 'I': case 'O':
        case 'U':
            printf ("Vowel\n");
            break;
        default:
            printf ("consonant\n");
    }
    return 0;
}
```

problem

Max number check program

Q.

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

int main()
{
    int num1, num2;
    clrscr();
    printf("Enter first number : ");
    scanf("%d", &num1);
    printf("Enter second number : ");
    scanf("%d", &num2);

    if (num1 > num2)
        printf("First number is greater");
    else if (num2 > num1)
        printf("Second number is greater");
    else
        printf("Both numbers are equal");

    getch();
}
```

Max, check of 3 numbers

```
#include<stdio.h>
int main()
{
    int num1, num2, num3;
    scanf ("%d %d %d", &num1, &num2, &num3);
    switch (num1 > num2)
    {
        case 1:
            switch (num1 > num3)
            {
                case 1:
                    printf ("Max : %d \n", a);
                    break;
                case 0:
                    printf ("Max : %d \n", c);
                    break;
            }
        case 0:
            switch (num2 > num3)
            {
                case 1:
                    printf ("Max : %d \n", b);
                    break;
                case 0:
                    printf ("Max : %d \n", c);
                    break;
            }
    }
    return 0;
}
```

example

問 从键盘输入一个整数 n 和一个字符 c，输出 n 的二进制表示和字符 c 的 ASCII 值。

```
#include <stdio.h>
int main ()
{
    int n;
    scanf ("%d", &n);
    switch (n)
    {
        case 1:
            printf ("Hello\n");
        case 2:
            int a, b;
            char c;
            scanf ("%d%d", &a, &b);
            scanf ("%c", &c);
            switch (c)
            {
                case '+':
                    printf ("%d\n", a+b);
                    break;
            }
    }
}
```

Assignment 2017. II

```

    goto (i++); ← [break  
base  
getz]
    case 1:
        printf ("%d\n", a-b);
    default:          // ab
        printf ("wrong input");
        <N. objects submitted>
    }
    // wrong test
    break;
}

case 2:
    printf ("=Welcome\n");
    break;           // off set
default:
    printf ("wrong");
}

int d, e;
char n;
scanf ("%d%d", &d, &e);
scanf ("%c", &n);
switch (n)
{
    case 1:
        printf ("%d\n", a+b);
        break;
    case 2:
        printf ("%d\n", a/b);
    default:
        printf ("wrong number");
}

```

□ Loop statement

① for

② while

③ do-while

start
end
step

(start
↑ ; ↑ ; ↑
end)

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

```
int main ()
```

```
{
```

```
    int i;
```

```
:(" m/sm for (i=1; i<=100; i++)
```

```
{ printf ("%d Hello\n"); }
```

```
:(" return 0; ")
```

```
}
```

```
out put
```

```
1 Hello
```

```
2 Hello
```

```
...
```

```
- - -
```

```
100 Hello
```

⊗⊗⊗ [Semantics 2 টির মাঝের রোধ কোনো
out put আসবেই]

① এখন মান কোর্ট করে reverse order তে

জাপান এতো সহজেই করে

#include <stdio.h>

int main()

{

 int i;

for(; i<=100; i++)

undetermined
ভূল থাকবে

{

 for (i=1; i<=100; i++)

 i++

 printf("%d Hello", 101 - i);

 }

 return 0;

}

for (i=1; i<=0; i++)

 output

 1 Hello

 0 Hello

 output

 100 Hello

 99 Hello

 1 Hello.

for (i=100; i<=0; i-)

 output

 -

for (i=1; i<=100; i=)

 output

 minus 1 for
 infinity

for (i=1; i<=100;)

 output

 infinity এ 1

for (i=1; i<=0; i+)

 output

 infinity

for (i=1; i<=0; i+)

 output

 -

problem
to

WAP to print all the numbers between 1 to 100 which are divisible by 2 or 3

Q) print all the numbers between 1 to 100 which are divisible by 2, or 3

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

```
int main()
```

```
{
```

```
int i;
```

```
for (i=1; i<=100; i++)
```

```
{
```

```
if ((i%2==0) || (i%3==0))
```

```
{
```

```
printf ("%d\n", i);
```

```
}
```

```
}
```

```
*
```

```
return 0;
```

```
}
```

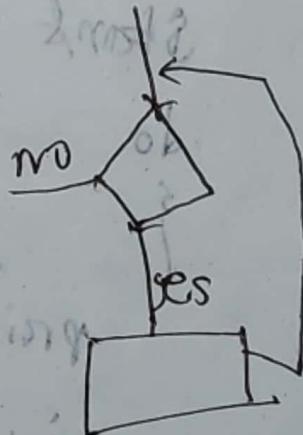
田 While loop

While বিপ্রকরণে কোড স্টার্ট

" " ফর্মেট [condition] এন্ড
" " ফর্মেট স্টেপ



```
i = 1;  
while ( i <= 0 )  
{  
    printf ("%d\n", i );  
    i++;  
}
```



; (0 < i) এন্ড {

problem
||

code transfer

from white to for

```
#include <stdio.h>  
int main()  
{  
    i = 0;  
    while ( i > 0 )  
    {  
        printf ("%d\n", i );  
    }
```

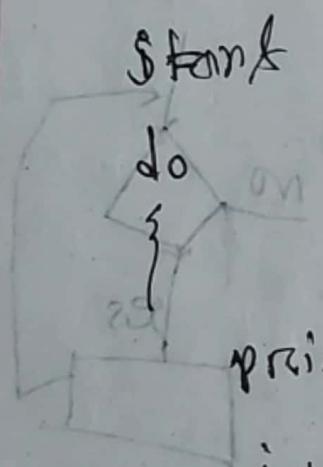
```
for ( i = 10; i > 0; )  
{  
    printf ("%d\n", i );  
}
```

do - while loop

এখনো do, যাইহোক step করে আসুন

নিচে [while (condition);]

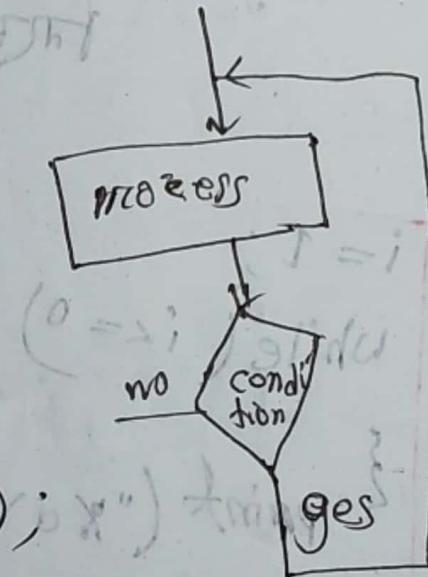
sample



printf ("%d\n", i);
i++

}

while (i > 0);



step	for	while	do - while
true 10	10	10	10
false 0	0	0	1

problem
12

n number of n² by for loop, while, do-while

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

```
int main()
```

```
{
```

```
    int i, n, sum = 0;
```

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

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

```
    {
```

```
        sum = sum + i;
```

```
    } printf("%d\n", sum);
```

```
    printf("sum is: %d\n", sum);
```

```
    return 0;
```

```
}
```

1 + 3 + 5 + ... n²

```
for (i = 1; i <= n; i + 2)
```

```
{
```

```
    sum = sum + i * i;
```

```
}
```

```
printf("sum is: %d\n", sum);
```

series

1 - 2 + 3 - 4 + ... - n

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

```
{
```

```
if ( i % 2 == 1 )
```

```
{
```

```
sum = sum + i * i;
```

```
}
```

```
else
```

```
{
```

```
sum = sum - i * i;
```

```
}
```

```
}
```

```
printf(" sum is: %d\n", sum);
```

15
15

($i \neq 1$: $i \neq 1$ or $i = 1$) nob

$(i \neq 1) + \text{neg} = \text{pos}$

((pos - neg) \times 2) $\neq 0$

$$\oplus \quad 1+2-3+4+5+6 \dots n$$

35197 4703 674

~~More factors~~

```

for ( i=1; i<=n; i++)
{
    if (i%3 == 0)
    {
        sum = sum + i;
    }
    else
    {
        sum = sum + i;
    }
}

```

(Rebong, or "w/bs - !bs") thing

```
printf ("Sum = %d", sum);
```

return 0;

problem

13

take a number as input and show
it's factorial:

#include <stdio.h>

int main()

{

 int i, n, product = 1;

 scanf ("%d", &n);

 for (i=1; i<=n; i++)

{

 product = product * i;

}

 printf ("%d! = %d\n", n, product);

}

int i;

for (i=1; i<=10; i++)

{

 printf ("%d\n", i);

}

{
 cout << print << "

আপনার কোডটি সেইর মতৰ
ফাঁকে ব্যবহার কৰতে পারেন

সাথে আপনার কোডটি কৰুন

ব্যবহার কৰুন

ব্যবহার কৰুন

ব্যবহার কৰুন

problem
14

prime number

Take a number as input and find if it is prime or not

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

```
int main()
```

```
{ int flag = 1;
```

```
int i, n;
```

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

```
for (i=2; i<n; i++)
```

```
{
```

```
if (n % i == 0)
```

```
{
```

```
flag = 0
```

```
break;
```

```
}
```

```
} if (flag == 1)
```

```
{
```

```
printf ("prime number");
```

```
}
```

```
else
```

```
{
```

```
printf ("not prime number");
```

एक नंबर को चेक करें।
2 से अपर्याप्त तक सभी नंबरों को
check करें और flag

problem
16

(STRTS) common divisor

Take two numbers as input and find

H.C.D

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

```
int main()
```

```
{
```

```
int a, b, max, min, rem;
```

```
scanf ("%d %d", &a, &b);
```

```
if (a > b)
```

```
{
```

```
max = a;
```

```
min = b
```

```
}
```

```
else
```

```
{
```

```
max = b;
```

```
min = a;
```

```
}
```

```
;(common divisor for a) thing
```

For eg. finding 24
$$\begin{array}{r} 3) 24 \\ 2) 3 \\ 2) 1 \end{array}$$

$$24 = 2 \times 2 \times 2 \times 3$$

$$\text{GCD} = 2$$

ବାହ୍ୟରେ କାମ କରିବାର ପାଇଁ ଏହାକିମ୍ବାନ୍ଦୁ
କାମ କରିବାର ପାଇଁ ଏହାକିମ୍ବାନ୍ଦୁ

```

while (max%min != 0)
{
    rem = max%min;
    max = min;
    min = rem;
    for (i=1; i<=10; i++)
        printf (" GCD : %d\n", min);
    return 0;
}

```

⊗ Math କେବେ ଲାଗିଲା | the method of find the

ଲମ୍ବାକୁ | ଯୋଟି ଘର୍ତ୍ତ କରିବା, ଯାଏ ଅଳ୍ପକାର କରିବା
 ୧୮ | ଅଳ୍ପକାର (0) ନୀ ହଲ କରି ଅଳ୍ପକାର କରିବା
 ଏବଂ ଅଳ୍ପକାର (1) କରି ଅଳ୍ପକାର କରି ଏବଂ କରିବା
 ୨୮ | ଅଳ୍ପକାର (0) କରିବାରେ - ଏବଂ କରିବା

3 11

$$\begin{array}{r}
 3) 11 (3 \\
 \hline
 9 \\
 2) 3 (1 \\
 \hline
 2 \\
 1) 2 (2 \\
 \hline
 0
 \end{array}$$

lcm = $\frac{a+b}{a-b}$

~~problem~~ 17

Output of = code \rightarrow for) Loops

```
#include <stdio.h>
int main ()
{
    int i;
    for (int i = 0; i < 5; i++)
    {
        printf ("Hello %d\n", i);
    }
    return 0;
}
```

Output

Hello 1

Hello 2

Hello 3

Hello 4

Hello 5

problem
18

Spiral

```
#include <stdio.h>
int main()
{
    int i, k;
    for (i = 1; i <= 5; i++)
    {
        for (k = 1; k <= 3; k++)
        {
            printf("%d\n", k);
        }
        printf("Hello %d\n", i);
    }
    return 0;
}
```

Output

Hello 1

Hello 2

Hello 3

Hi 1

Hello 1

Hello 2

Hello 3

Hi 2

Hello 1

Hello 2

Hello 3

Hi 3

Hello 1

Hello 2

Hello 3

Hi 4

Hello 1

Hello 2

Hello 3

Hi 5

problem
19

out put

include <stdio.h>

int main()

{

int i, j, k;

for (i=1; i<=9; i++)

{

for (j=1; j<=3; j++)

{

for (k=1; k<=2; k++)

{

i("n/b" printf ("How are you\n");

}

printf ("Hello"),

{

printf ("\nHi\n");

{

printf ("\nBye\n");

return 0;

}

out put

How are you

How are you

Hello

How are you

How are you

Hello

How are you

How are you

Hello

Hi

How are you

How are you

Hello

How are you

How are you

Hello

How are you

How are you

Hello

Hi

notice not writing errors

How are you

How are you

Hello

How are you

How are you

Hello

How are you

How are you

Hello

Hi

How are you

How are you

Hello

How are you

How are you

Hello

How are you

How are you

Hello

How are you

Hi

Bye

some condition for switch

- for doo

- ① integer
- ② character
- ③ equality check
- ④ compare with constant

load Divisor \rightarrow for fmod (a/b);

L=;

SP

iH

0110H

0110H
0000H
0000H
0000H

} } }

} } }

} } }

} } }

} } }

} } }

Pattern

*
* *
* * *
* * * *

* * * *
* * *
* *
*

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

```
int main()
```

```
{
```

```
    int n;
```

```
    scanf("%d", &n); /* Input */
```

```
    int i, j; /* i = row, j = col */
```

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

```
    { /* i = row, j = col */
```

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

```
            /* printing */
```

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

```
    } /* printing */
```

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

```
}
```

```
return 0;
```

```
}
```

<file global #

(global.h)

}

(main.h)

}

}

}

{

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

```
int main()
```

```
{
```

```
    int i, j, n;
```

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

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

```
{
```

```
        for (j=i; j<=n-i; j++)
```

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

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

```
    }
```

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

```
}
```

```
return 0;
```

```
}
```

```
:0 result
```

```
{
```

- - - *
 - - * *
 - * * *
 * * * *

Space মাঝে
 for loop ও বার

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

```
int main ()
```

```
{
```

```
int n, i, j, k;
```

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

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

```
{
  (for (j=1; j<=n-1; j++))
```

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

```
}
```

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

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

```
}
```

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

// new line

```
return 0;
```

```
}
```

```
{
```

include <stdio.h>

int main()

{

int n, i, j, k;

scanf("%d", &n);

for (i=1; i<=n; i++) { j=i } rot

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

printf(" ");

printf("\t");

rot 11

{ i=n }

for (k=1; k<=n+1-i; k++)

{ ("x") filling }

printf("x");

out word 11

{ ("w") filling }

printf("w");

the return 0;

}

}

* * * *
* * * * 2092
--- * *
- - * * rot

i
1
2
3
4

space
0
1
2
3

star
4
3
2
1

i = 4 j = i-1 5-i

2092 solution #

condition

(i < n)

?

(i < n)

(i < n) 2092

(i < n)

(i < n)

(i < n)

(i < n)

(i < n)

(i < n)

(i < n)

(i < n)

(i < n)

(i < n)

(i < n)

(i < n)

#include <stdio.h>

int main()

{ int n, i, j, k;

scanf("%d", &n);

for (i=1; i<=n; i++)

{

for (j=1, j<=n-i; j++)

{

printf(" ");

}

for (k=1; k<=2*i-1; k++)

{

printf("*");

}

printf("\n");

}

return 0;

}

* * * * *
* * * * *
* * * * *
* * * * *
* * * * *

space

star

1 2 3 4 5
1 2 3 4 5
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~~$O(n^2)$~~ $O(n-1)$

#include <stdio.h>

```

int main()
{
    int n;
    scanf("%d", &n);
    for(i=1; i<=n; i++)
    {
        for(j=i; j<=n-1; j++)
        {
            printf(" ");
        }
        if(i==2)
        {
            printf("*");
        }
        if(i!=1)
        {
            printf(" *");
        }
        printf("\n");
    }
}

```

Get some information for, for, while, do-while Loop

⊗ counter-control

ফোর Loop এ Loop কর্তৃতা দ্বারা অথবা জানা যাবে কিন্তু কাউন্টার কন্ট্রুল করে কাউন্টার কন্ট্রুল

মুন্তর Loop এর মতো দ্বারা করকে বলা হবে (Loop index) (i)

⊗ sentinel-control

ফোর Loop এ Top Looping কর্তৃতা হবে অথবা জানা না যাবে sentinel-control

int i = 0;
while (i < 10) {
 counter
}

int i = 0;
while (1) {
 infinite
 {
 scanf ("%d", &n);
 printf ("%d", i);
 if (i == -1) sendind
 break;
 }
}

good slink-ob slink rot . rot rotation some more

*

*

*

contours - contours

array to *ptr - arrays good → good for first

** * contours - contours contours to arrays

(object) include <stdio.h>

(i) int in the array good for first

int main ()

{

contours - contours

to do int print good for first for loop

bottom for (i=1; i<=5; i++)

{ object for (j=1; j<=i-1; j++)

{ to two, i=0 to i free

printf (" ");

staircase: i=0 to i free

(0) slink

slink

: (0, " ", " ") brace

: (" ", " ") brace }

printf (" *\n");

bottoms (0=0) again make it

i print()

4

Array

int student[10];

student[0];

student[1];

student[2];

student[3];

student[4];

Array কিরণ কৈ হবে বিশেষ

index কল। কোর না declare কোর তা

কোর কোর কোর কোর কোর কোর

[Datatype array [array size]]

int mark[5];

mark[0] = 19;

mark[1] = 20;

mark[2] = 20;

int mark[5] = { 19, 20, ..., 20 };

int mark[5] = { 19, 20, ..., 20 };

int mark[5] = { 19, 20, ..., 20 };

5 marks

by default = 0
LIFO

④ int mark[5] = {1, 2, 3}; // attribute tri

mark[0] = 1;

mark[1] = 2;

mark[2] = 3;

mark[3] = 0;

mark[4] = 0; // attribute LIFO

④④④ int mark[8] = {1, 2, 3, 4, 5, 6, 7}; // attribute LIFO

mark[0] = 1; ignored

- [2, 3, 4, 5, 6, 7] porto [attribute LIFO]

mark[9] = 5;

④④④ int num[10] = {10, -2, 3, 4};

num[2] = 3; tri

num[5] = 0

num[9] = 0

num[11] = memory out of bound of error.

⊗⊗⊗

int num[10] = {};

ref. object declaration

(uninitialized)

num[0] = { };

..... → = 0 (uninitialized)

num[9] = { };

(++, i++ (0=i)) rot

⊕ Array input / output

#include <stdio.h>

int main()

{

int number[5];

int i;

for (i=0; i<5; i++)

{

scanf("%d", &number[i]);

}

for (j=0; j<5; j++)

{

printf("%d", number[i]);

}

input 0 1 2 3 4

output 0 1 2 3 4

Reverse order print

```
#include<stdio.h>
int main()
{
    int number[5];
    int i;
    for(i=0; i<5; i++)
    {
        scanf("%d", &number[i]);
    }
    for(i=4; i>=0; i--)
    {
        printf("%d", number[i]);
    }
    return 0;
}
```

Input 0 1 2 3 4
Output 4 3 2 1 0

Average

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

```
int main()
```

```
{
```

```
int number[5] = {}, sum = 0;
```

```
int i;
```

```
float avg;
```

```
for (i = 0; i < 5; i++)
```

```
{
```

```
scanf ("%d", &number[i]);
```

```
}
```

```
for (i = 0; i < 5; i++)
```

```
{
```

```
sum = sum + number[i];
```

```
}
```

```
avg = sum / 5.0; printf ("%f", avg);
```

```
printf ("%f\n", avg);
```

```
}
```

input = 1 2 3 4 5

output = 3.00000

problem
1

④ Declare an array of size 10 and store series 2, 4, 6, 8, ... in it.

#include <stdio.h> // reading a file

int main()

{

int number[10]

: int i, temp = 2;

for (i=0; i<10; i++)

{

number[i] = temp;

: number[i] = temp + 2;

}

printf ("%d", number[i]);

return 0;

}

Ans : 2 4 6 8 10 12 14 16 18

Ans : 2 4 6 8 10 12 14 16 18

problem
2

declare an array of to size 10; and store this series 0, 1, 10, 2, 10, 3.

```
#include <stdio.h>
int main()
{
    int number[10], i, temp = 1;
    for( i=0; i<10; i++)
    {
        if (i==0)
        {
            number[i] = 10;
        }
        else
        {
            number[i] = temp;
            temp = temp + 1;
        }
    }
}
```

2/17 Declare an array of size 10, and save store this series, 10, 3, 20, 6, 30, 9.....

```
int number[10], temp1 = 10, temp2 = 3;
for (i=0; i<10; i++) {
    if (i%2 == 0) {
        number[i] = temp1;
        temp = temp + 10;
    } else {
        number[i] = temp2;
        temp2 = temp2 + 3;
    }
}
```

problem

type of fibonacci

int F[6] = {0}* i;

F[0] = 1;

F[1] = 1;

for (i=2; i<=5; i++)

{

F[i] = f[i-1] + F[i-2];

printf("%d %d %d \n", F[i-2], F[i-1], F[i]);

}

printf ("%d %d %d", F[i-2], F[i-1], F[i-1]+F[i-2]);

(++i) = F[4] = F[5] = F[5]+F[4]

$$5 + 8 = 13$$

output

5 8 13

total output

1 1 2
1 2 3
2 3 5
3 5 8
5 8 13

problem
5

maximum to out

Take n numbers from user and find the maximum value.

{

possible
nt

int n ;
scanf ("%d", & n);
int array [n];

int number [10000];

int n, i ;

scanf ("%d", & n); // $b.o. b.d. b.p.$ // wrong

for ($i=0$; $i \leq n-1$; $i++$)

{

 scanf ("%d", &number[i]);

}

int max = number[0];

for ($i=1$; $i \leq n-1$; $i++$)

{

 if (number[i] > max)

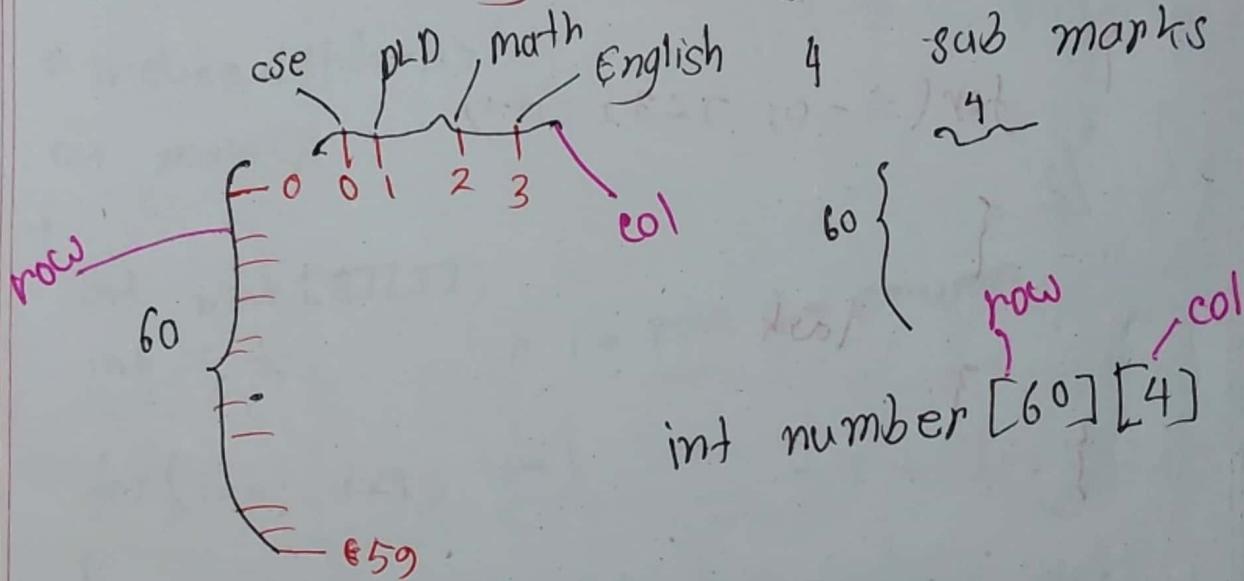
}

 max = number[i];

2D Array

printf ("%d", marks);

2d Array



int number [60][4]

ID 26 Gr math < number [25][2] >

index error < number [30][4] >

col 4 not possible
that's why

MATRIX A = $\begin{bmatrix} 1 & 2 & 3 \\ 7 & 10 & 11 \end{bmatrix}$ → int A[2][3];

for ()
{ for () }

problem
I

PROMT Q.S.

⊗⊗⊗ int arr[4][3]

for(@i=0; i<4; i++)

{ for(@j=0; j<3; j++)

{ { } 0 } 0 } 0 }

loop way task

[4][3] } 0 } 0 } 0 }

⊗⊗⊗ int array [10]

for(i=0; i<10; i++)

{ { } 0 } 0 } 0 }

task

return
value

{ [5][5] A } + B ← { 0 0 0 0 0 } { A X A B C D F }

() rot ↘
() rot ↘

problem
1

multiple choice questions

Q Q Q Declare an array of size 3×3 and take all the numbers as input also print the array.

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

```
int main()
```

```
{
```

```
    int mat[3][3];
```

$i = \text{row}, j = \text{column}$

```
    int i, j;
```

```
    for (i=0; i<3; i++)
```

```
    {
```

scanf ("%d", mat[i][j]);

```
}
```

~~printf ("\n");~~

// for output

```
    for (i=0; i<3; i++)
```

```
    {
```

for (j=0; j<3; j++)

```
    {
```

printf ("%d", mat[i][j]);

```
    }
```

~~printf ("\n");~~

```
}
```

some information

⊗⊗⊗ int array[3][3] = { 1, 2, 3, 4, 5, 6, 10, 12, 13 };

Output 1, 2, 3,

1 2 3 4,
4 5 6

10 12 13 \rightarrow i = 0, j = 1, i + j = 1

⊗⊗⊗ int a[3][3] = { 1, 2, 3, 4 };

Output

1 2 3
4 0 0 } \rightarrow i = 0, j = 1, i + j = 1
0 0 0 } \rightarrow i = 1, j = 1, i + j = 2

⊗⊗⊗ int array[3][3] = { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 };

Output = 1 2 3
4 5 6
7 8 9

int a[3][3] = { { 1, 2, 3, 4, 5, 6, 7 } }

Output = 1 { 2, 3 }
4 { 5, 6 } } \rightarrow i = 0, j = 1, i + j = 1
7 0 0 } \rightarrow i = 1, j = 1, i + j = 2

$\alpha + (n-1) \times d$

⊕ ⊕ ⊕ int $a[3][2] = \{1, 2, 3, 4, 5, 6, 7\}$; no error

Output

①	1 2	②	1 2 3	③	1 2 3 4
	3 4		4 5 6		5 6 7 0
	5 6		7 0 0		0 0 0 X
X		X			

codeblocks error

⊕ ⊕ ⊕ int num[3][2] = {1, 2, 3, 4, 5, 6, 7, 8};

Output \Rightarrow 1 2
3 4
5 6

:(" :a") thrasing
:(m3, "b.") thrasing
:((" :a") thrasing
:(m3, "b.") thrasing

:([3][2]) write to
(++i consi ;o=i) not

(++i - (m3i ;o=i) not

:([0][2] consi ;o=i) thrasing

problem
2

b-(C-A)+A

••• take an array of sizes $n \times m$ as input
and show it's transpose

{ Trapping means,
row = column
column = row }

$$\begin{matrix} n=3 & A \rightarrow 0 & 1 & A^T \\ m=2 & 2 & 3 & \rightarrow \\ & 5 & 6 & \end{matrix}$$

#include<stdio.h>

int main()

{

 int n, m, i, j;

 printf("n: ");

 scanf("%d", &n);

 printf("m: ");

 scanf("%d", &m);

 int array[n][m];

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

{

 for(j=0; j<m; j++)

{

 scanf("%d", &array[i][j]);

}

}

11. for output

```
for( j=0; j<m; j++)
{
    for( i=0; i<n; i++)
        cout << array[j][i];
    cout << endl;
}
```

input

```
#include <iostream>
int n = 3;
```

m = 2

output

```
0 1
2 3
4 5
```

```
0 2 4
1 3 5
2 4 6
```

problem

3

take 2 3×3 matrices as inputs and print their sum.

```
#include <stdio.h>
int main()
{
    int matrix1[3][3], matrix2[3][3];
    int sum[3][3], i, j;
    for (i=0; i<3; i++) // for matrix1 input
    {
        for (j=0; j<3; j++)
        {
            scanf("%d", &matrix1[i][j]);
        }
    }
    for (i=0; i<3; i++) // for matrix2 input
    {
        for (j=0; j<3; j++)
        {
            scanf("%d", &matrix2[i][j]);
        }
    }
```

```

for (i=0; i<3; i++) // for sum
{
    for (j=0; j<3; j++)
    {
        sum[i][j] = matrix1[i][j] + matrix2[i][j];
    }
}

for (i=0; i<3; i++) // for print
{
    for (j=0; j<3; j++)
    {
        printf ("%d", sum[i][j]);
    }
    printf ("\n");
}

```

input

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

Output

2 4 6
5 7 9
13 15 17