

CS & IT ENGINEERING



Selection Statements

Control Flow Statement

Lecture No. 1



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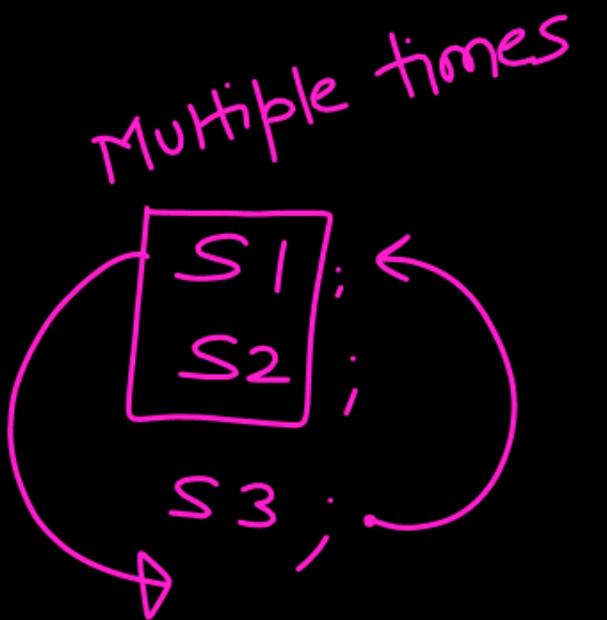
TOPICS TO BE COVERED

if else statements

Flow control statements

```
Void main(){  
    S1;  
    S2;  
    S3;  
    S4;  
}
```

by default
: sequential



Multiple times

Control Flow statement

- 1) Selection statements : if
if - else
if - else if else
if - else if
- 2) Iterative statements (Repetition)
 - for
 - while
 - do while
- 3) Jump statements : continue, break, exit, return

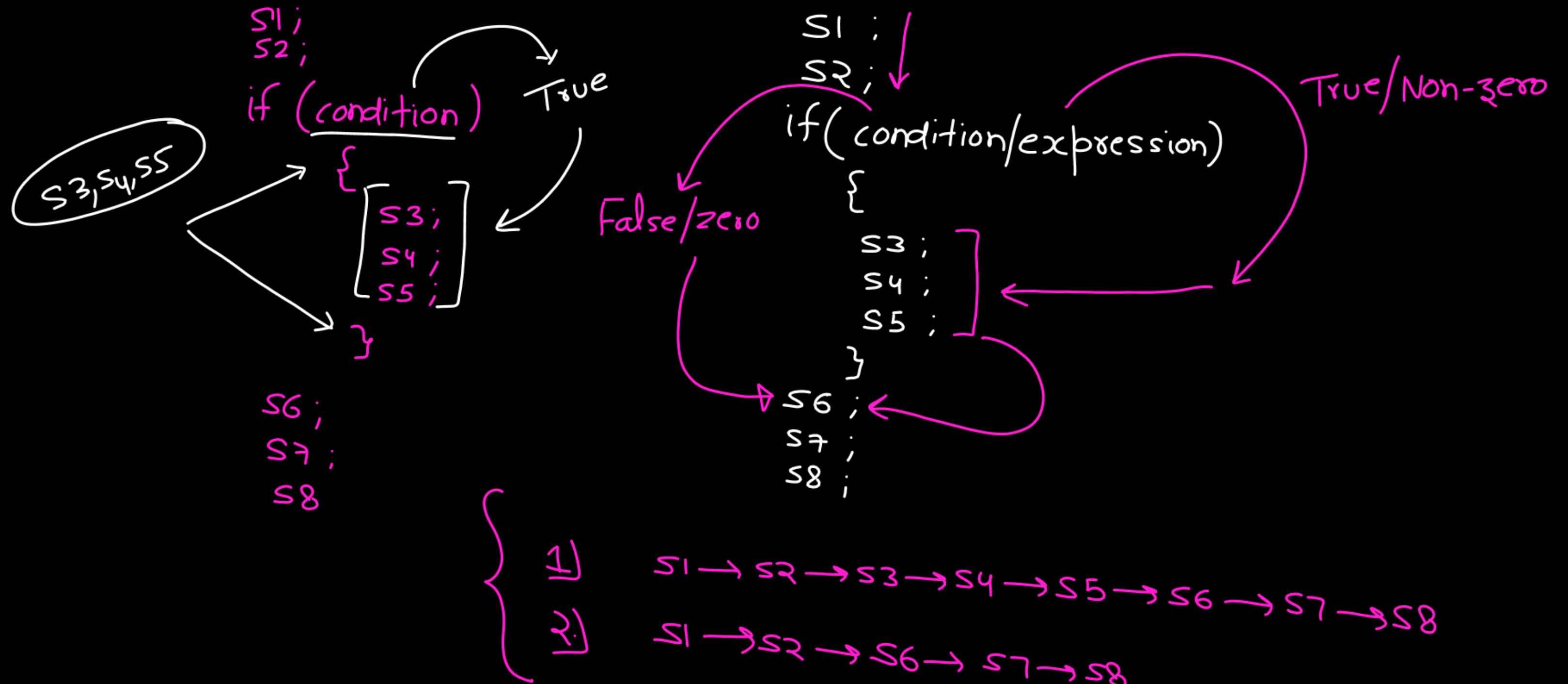
Selection statement

if statement :

```
void main(){  
    S1;  
    S2;  
    S3;  
    S4;  
    S5;  
    S6;  
    S7;  
    S8;  
}
```

Sequential

```
void main(){  
    S1; ✓  
    S2; ✓  
    if (condition){  
        S3;  
        S4;  
        S5;  
    }  
    S6; ✓  
    S7; ✓  
    S8; ✓  
}
```



Syntax

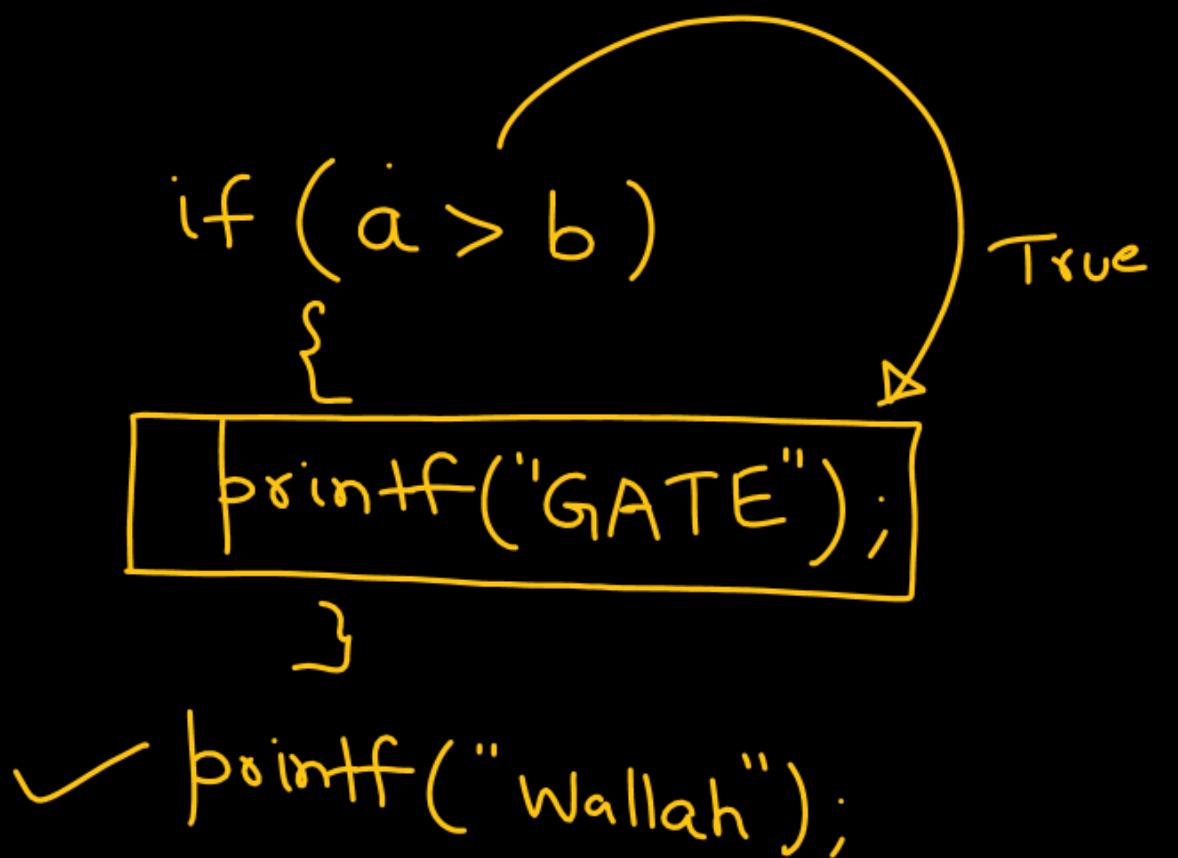
if (condition/expression)
 {
 S1;
 S2;
 S3;
 }

Scope

if (condition/expression)
 S1;
by default
 ⇒ First
 Semicolon

if (condition/expression)
 {
 S1 ;
 }

```
#include<stdio.h>
void main(){
    printf("GATE"); ✓
    printf("Wallah"); ✓
}
```



```
void main() {  
    if (5 > 2) { True  
        printf("Pankaj"); Block  
    }  
    printf("Sharma"); Block  
}
```

Pankaj Sharma

↓

```
void main() {  
    printf("START");  
    if (2 < 3) { True  
        printf("2"); Block  
        printf("3"); Block  
    }  
    printf("END"); Block  
}
```

START 23 END

2.

```
int i=3;
```

```
if ((i+2)){
```

non-zero/True

$$i+2 = 3+2 = 5 \text{ (non-zero)}$$

i+2

True

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

```
printf ("Kaise Ho");
```

}

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

```
printf("Hey");  
if (!2)  
    printf("Bhagwan");  
    printf("Bachalo");  
    printf("Is Rawan se");  
    ↓  
printf("Hey");  
if (!2) {  
    printf("Bhagwan");  
}  
    printf("Bachalo");  
    printf("Is Rawan se").
```

```
printf("Hey"); ✓  
if (2) {  
    printf ("Bhagwan");]  
    printf (" Bachalo");]  
    }  
}
```

```
printf("Is Rawan se"); ✓
```

Q)

```
void main() {  
    if ( printf("Hello"))  
    {  
    }  
}
```



```
Hello
```

if (5){



```
}
```

Q

```
void main(){
    if ( ! printf ("Pankaj"))
    {
        printf ("Sharma");
    }
}
```

O/P : Pankaj

value
6
Pankaj
if (! 6)
{
 Xprintf ("Sharma");
}

Q) `int i=4; if(i==4) printf("Pankaj");`

Comparison
True
i = 4

O/P: Pankaj

Q) `int i=0; if (i=4) { printf("Pankaj"); }`

4 → True(non-zero)

i
 [*4*]
 } *printf("Pankaj");*

O/P: No output

Q) `if(12.73) printf("2"); printf("3");`

non-zero(True)

[*printf("2");*]
printf("3");

O/P: 23

Q) `if() printf("Hello");`

Syntax Error

Q) `if(12 + 3 * 4) printf("2"); printf("3");`

24 → True

23

```
if(12+3×4)  
printf("2");  
printf("3");
```

```
void main(){
```

```
    if(12 + 3 × 4)  
    {  
        printf("2");  
    }  
  
    printf("3");  
}
```

Mandatory

printf("3");

23

$\text{++}a$ $a\text{++}$ (i) Increase a by 1(i') Use updated a (i) use a (i') Increase a by 1

Q

int $i = 0;$ USE 0if ($i\text{++}$) {

printf ("Hello");

}

No output

if (0)
{
 bf —
}

```
#include<stdio.h>
void main(){
```

```
    int i = 1;
```

```
    if (--i)
```

```
        printf("2");
```

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

```
}
```

Anna 24 Ghante
Chaukanna

for
→
Compiled

i
10

```
void main(){
```

```
    int i = 1;
```

```
    if(--i){
```

```
        printf("2"); X
```

```
}
```

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

```
}
```

O/P : 0

~~Q~~ void main(){

int i=3;

if (i<2) {

printf("Hello");

}

O/P : Hello

for
Compiler

int i=3;
if (i < 2) {
};
}
printf("Hello");

Mandatory

WAP to **read** a no. and if it is Even then print "Pankaj".

I/P : 13

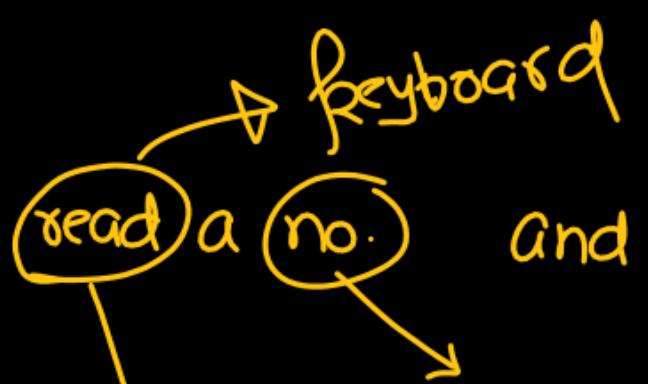
O/P : No output

I/P : 101

O/P : No output

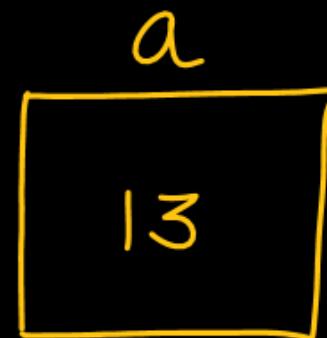
I/P : 4

O/P : Pankaj



int a ;

printf("Enter a number");
scanf("%d", &a);



if ($a \% 2 == 0$)

printf ("Pankaj");

Even $\Rightarrow \left\{ \begin{array}{l} \text{if} \\ \text{divide by 2} \\ \text{leaves} \\ q \\ \text{rem} = 0 \end{array} \right\}$

$a \sim [0]$

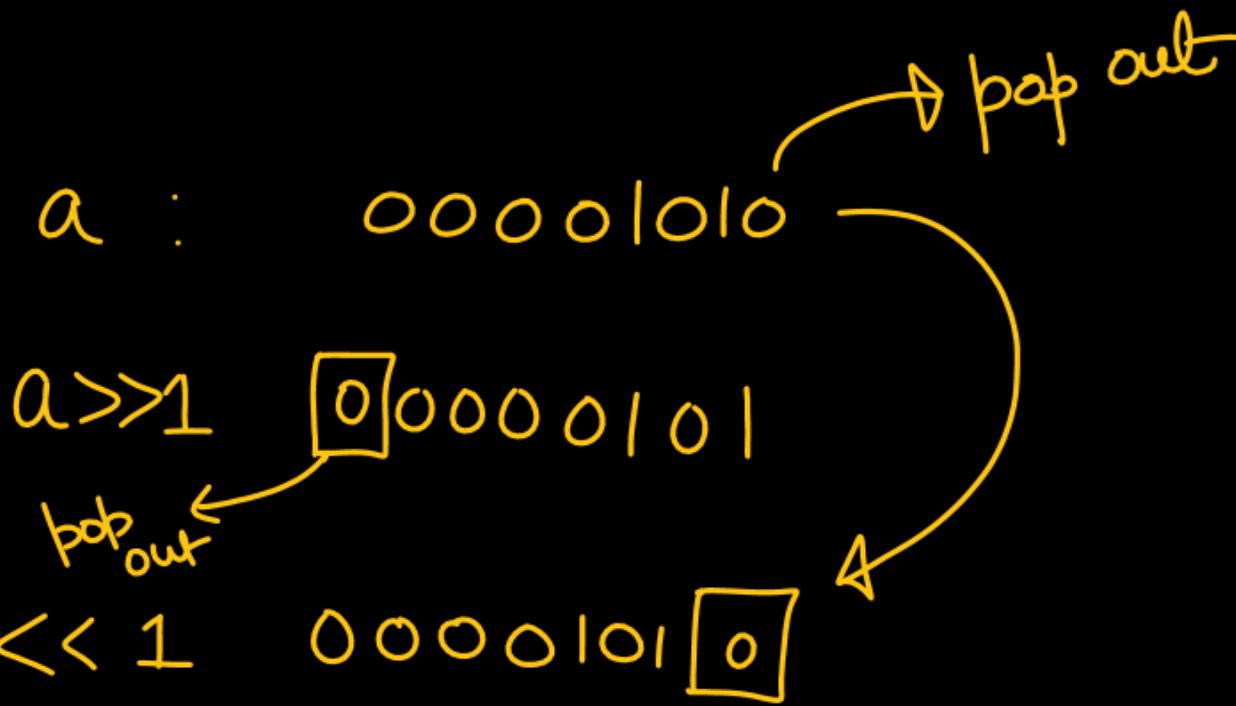
if $((a \& 1) == 0)$

$\sim [1]$

`printf("Pankaj");`

+ve numbers

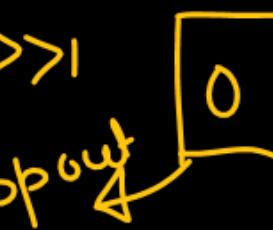
| 0

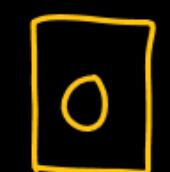


(($a >> 1$) $<< 1$)

$a = 11 :$

$a \quad 000\ 0101$  pop out

$a >> 1$  0000101

$<< 1$ 0000101 

if $(a == ((a >> 1) << 1))$

(i) $a \ll 1$

(ii) $a = a \ll 1$

①

int a=5;

printf("%d", a<<1); 10

printf("%d", a); 5

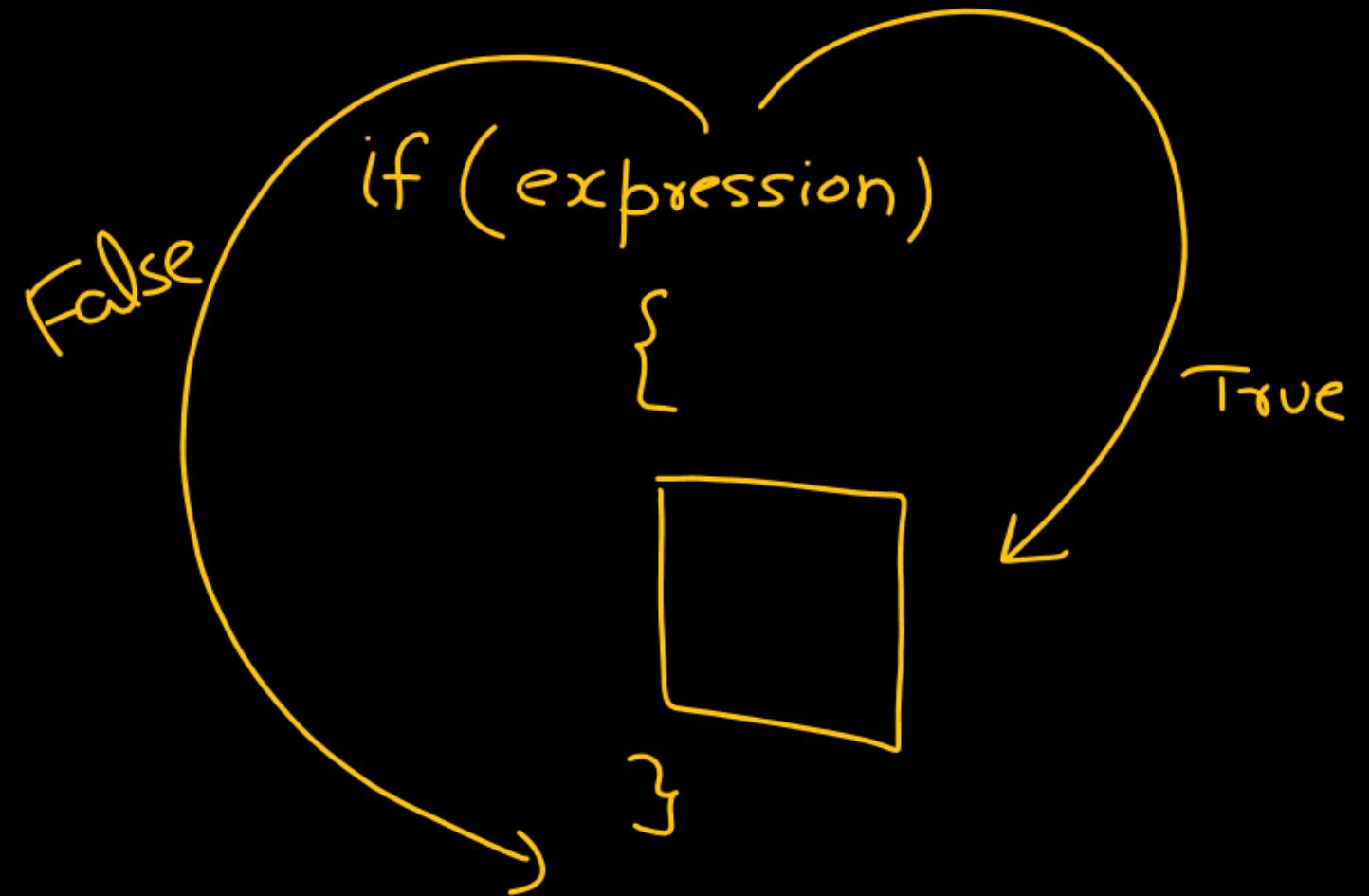
②

int a=5;

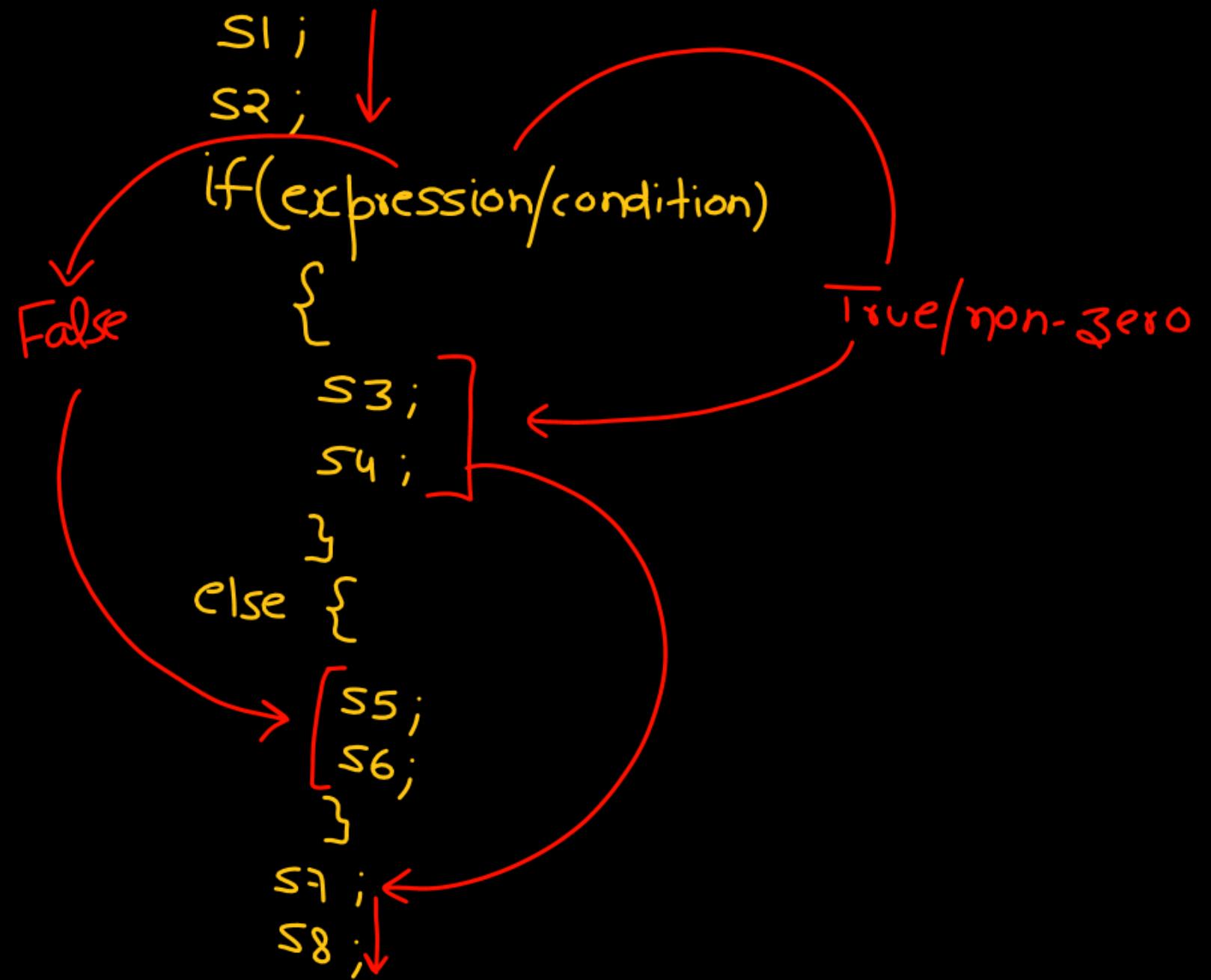
a = a<<1;

if - else statement

else : otherwise



Alternate
block of
code



$s_1 \rightarrow s_2 \rightarrow s_3 \rightarrow s_4 \rightarrow s_7 \rightarrow s_8$
 $s_1 \rightarrow s_2 \rightarrow s_5 \rightarrow s_6 \rightarrow s_7 \rightarrow s_8$

```
Void main(){
```

```
else
```

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

```
}
```

~~Error~~

```

if (2+3-6)
{
    printf("Hello");
    printf("Dosto");
}
else {
    printf("Maza");
    printf ("Aa gaya");
}

```

-1

True

$$\begin{array}{l}
 \overbrace{2+3}^{\text{+}} - \underbrace{6}_{\text{-}} \\
 = \cancel{5} - \cancel{6} \\
 = -1
 \end{array}$$

Picked same
+ -] L to R

\Rightarrow non-zero \Rightarrow True

O/P : Hello Dosto

2.

```
int i = 1;  
if ( i + 2 - 3 )  
    printf("Hello");  
else  
    printf ("2");  
    printf ("3");
```

O/P: 23

3.

```
int i = 2;  
if ( i + 2 - 3 )  
    printf("Hello");  
else  
    printf ("2");  
    printf ("3");
```

O/P : Hello3

WAP to take a integer from KB , if the no. is Even Prog. will print 1
otherwise prog. will print 0

```
int a ;  
printf("Enter a number");  
scanf ("%d", &a);  
if ( a % 2 == 0)  
    printf ("1");  
else  
    printf ("0");
```

if (exp){

}

if (exp){



}

else {



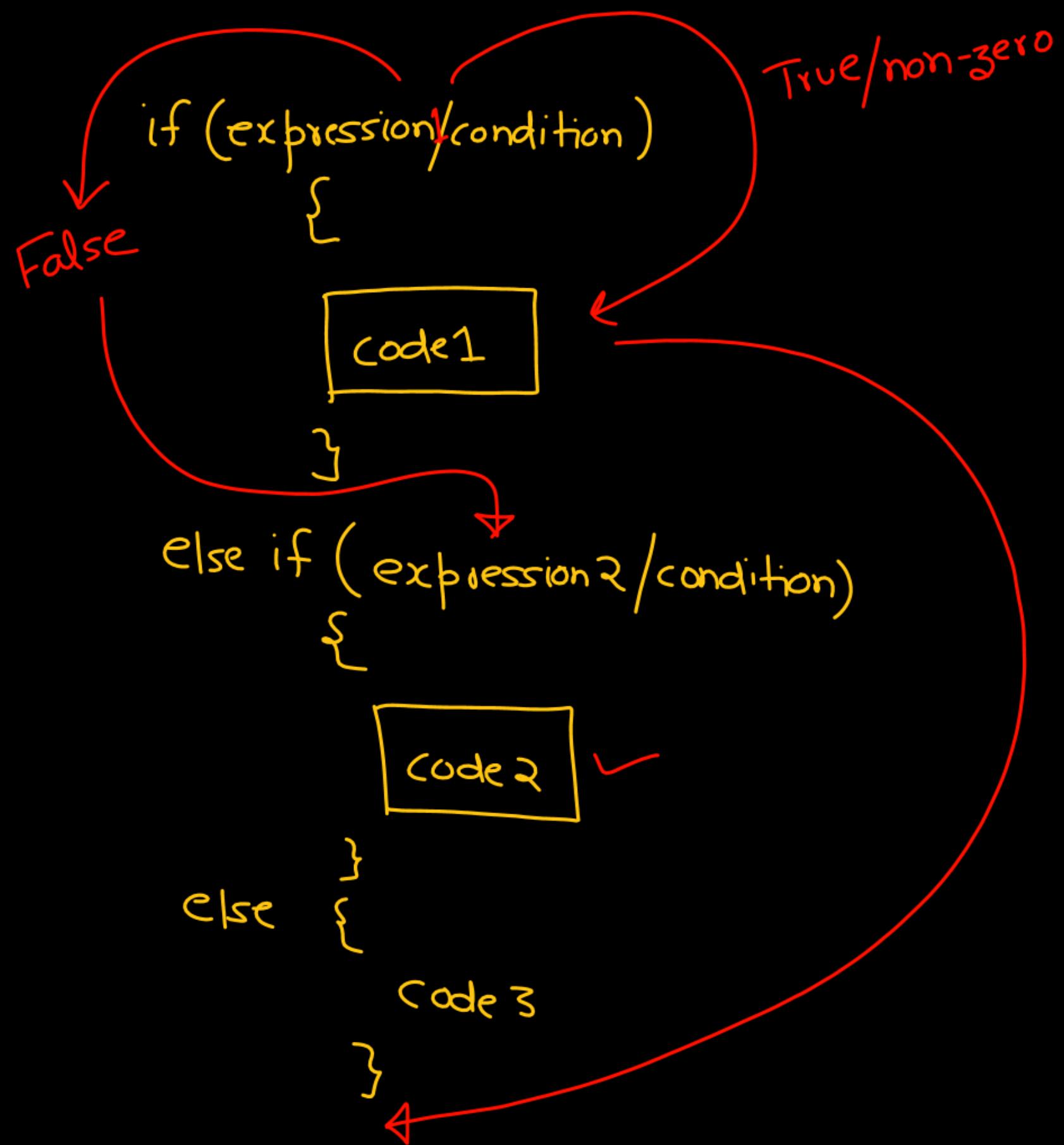
}

Take a integer , if i/p is greater than 0 \Rightarrow O/P +ve

if i/p is less than 0 \Rightarrow -ve

i/p is 0 \Rightarrow zero

else if



Code 1

Code 2

Code 3

only 1 will execute

Code 1 : expression1 : Non-zero (True)

Code 2 : expression1 → False
expression2 → True

Code 3 : exp1 → False
exp2 → False

Q. 5 Hrs

```
if (!2)
    printf("Hello");
else if (2+3-5)
    printf("Dosto");
else
    printf("Ye Rawan Faculty hai");
```

Ye Rawan Faculty hai

```
if (2)
    printf('2'); ✓
if (3)
    printf('3'); ✓
else
    printf('4'); ✓
```

Q 3

```
if (2)
    printf("2");    234
if (3)
    printf("3");
if (4)
    printf("4");
```

```
if (✓2)
    printf("2");    2
else if (3)
    printf("3");
else if (4)
    printf("4");
    ↙
```

largest among 2
np.

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

```
void main(){
```

```
    int a,b,max ;
```

```
    printf ("Enter 2 numbers");
```

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

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

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

```
}
```

```
int a,b,max
```

```
printf ("Enter 2 numbers");
```

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

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

```
    max = a;
```

```
else
```

```
    max = b;
```

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

```
void main() {  
    if ( 2 )  
        printf ("Hello");  
        printf (" Mazaa");  
    else  
        printf ("Aa raha");  
        printf (" Ya nahi");  
}
```

Error

```
if (2){  
    printf ("Hello");  
}  
[printf ("Mazaa");]  
else
```

```
if ( ){  
}  
}  
=====  
else{  
}
```

logic:

3 distinct Numbers

a, b, c

True

if (a > b && a > c)

 ⇒ printf("%d is largest", a);

if (b > a && b > c)

 printf("%d is largest", b);

if (c > a && c > b)

 printf("%d is largest", c);

a = 30
b = 20
c = 10

a b c

if (a > b && a > c)

 printf("%d is largest", a);

else {

 ↑
 a is not
 largest
 Either
 b, c

 if (b > c)

 printf("%d is largest", b);

 else

 printf("%d is largest", c);

}

distinct a, b, c

largest = $(a > b \text{ \&\& } a > c) ? a : (b > c) ? b : c ;$

4
distinct no a, b, c, d

largest = $(a > b \text{ \&\& } a > c \text{ \&\& } a > d) ? a : (b > c \text{ \&\& } b > d) ? b : (c > d) ? c : d ;$

False
(b, c is largest)

b, c, d

c, d

