Weekly Quiz 15

C Programming

GO Classes 2024 | Weekly Quiz 15 | Programming | Question: 1

Which of the following(s) will evaluate to true

A. $0 \;\&\&\; 0 == 0$ F
B. $0 \;\&\&\; 1 == 0$ F
C. $1 \;||\; 0 == 0$ T
D. $1 \;||\; 1 == 0$ T

0 && anything ⇒ false

1 || Anything ⇒ True

goclasses2024_wq15 | goclasses | programming | programming-in-c | multiple-selects | 1-mark

https://gateoverflow.in/373101/go-classes-2024-weekly-quiz-15-programming-question-1

GO Classes 2024 | Weekly Quiz 15 | Programming | Question: 2

What will be the output printed by the following program?

```
#include <stdio.h>
int main()
{
    int i = 1;
    for(i = 0; i<10; i+3){
    switch(i)
    {
        case 3:
            printf("Hi. This is case 3");
            break;
        case 6:
            printf("Hi. This is case 6");
            break;
            break;
        default:
            printf("Hi. This is default");
            break;
    }
    return 0;
}
```

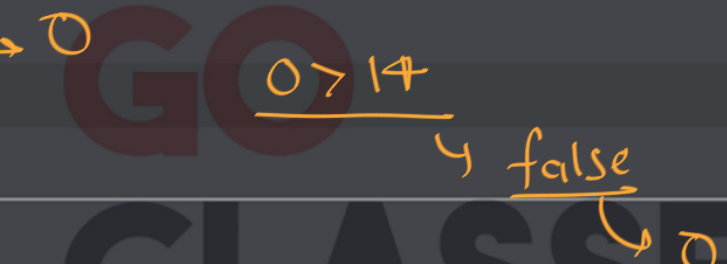
this is NOT i = i+3

A. Hi. This is case 3
B. Hi. This is case 6
C. Infinite Execution
D. Hi. This is default

GO Classes 2024 | Weekly Quiz 15 | Programming | Question: 3

What will be the value printed by the following program?

```
int i = 10;
i = !i > 14;
printf("%d", i);
```



A. 10
B. 14
C. 0
D. 1

https://gateoverflow.in/373099/go-classes-2024-weekly-quiz-15-programming-question-3

9

Answer: C

! has higher priority than $>$,

$!10$ will give false i.e. 0 and $0 > 14$ is also false so i will store value 0, hence 0 will be printed.

answered Mar 26, 2022

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4

What will be the output?

```
int a = 4, b =15, c =29;
if(c>b>a)
    printf("TRUE");
else
    printf("FALSE");
```

29 > 15 > 4
↳ TRUE
↳ 1 > 4
↳ false

A. TRUE
B. FALSE
C. Syntax Error
D. Compilation Error

goclasses2024_wq15 | goclasses | programming | programming-in-c | 1-mark

https://gateoverflow.in/373098/go-classes-2024-weekly-quiz-15-programming-question-4

GO Classes 2024 | Weekly Quiz 15 | Programming | Question: 5

9

If x, y, z, and w are declared as integer variables, which of the following expressions are NOT valid in C?

A. $x + 5 = y + z$
B. $x = y = z + w$
C. $x = (z - y) == w$
D. $w = x! = y \;\&\&\; z$

expression

$x+5 =$ something

https://gateoverflow.in/373097/go-classes-2024-weekly-quiz-15-programming-question-5

Answer: A

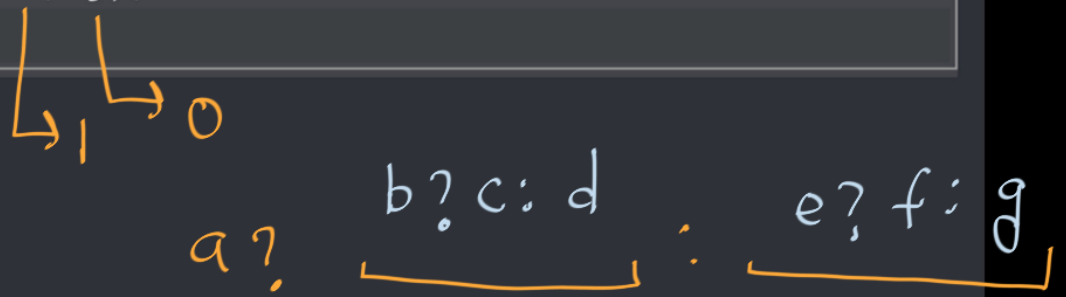
GO Classes 2024 | Weekly Quiz 15 | Programming | Question: 6

10

What will be the output of the following C program?.
Here ? : is a ternary operator which is right to left-associative.

```
#include <stdio.h>
int main() {
    int i =2, j =1;
    if (--j ? ++j? i : i++ : i--)
    printf("%d%d\n", i, j);
}
```

A. 1 0
B. 2 1
C. 1 1
D. 2 0



https://gateoverflow.in/373093/go-classes-2024-weekly-quiz-15-programming-question-6

GO CLASSES

```
a ? b ? c : d : e ? f : g
```

```
a ? (b ? c : d) : (e ? f : g)
```

GO CLASSES

```
if (--j ? ++j? i : i++ : i--)
```

i = 2

j = ~~1~~ 6

--j ? ++j ? i : i++ : i--

if (--j)

++j ? i : i++

else

i--

Sachin Mittal 1 ✔ commented Jun 1

It is best to convert this into an equivalent if-else statement and then solve ternary operator questions in the C programming language.

```
if (a? b? c : d : e) is same as -
if (a? (b? c : d) : e)
```

```
if (--j) {
    if (++j) {
        i;
    } else {
        i++;
    }
} else {
    i--;
}
```

A

GO Classes 2024 | Weekly Quiz 15 | Programming | Question: 7

5

What is the value printed by the following program?

```
int main()
{
    int a = 0, b = 1, c = 0, d =-1;
    d = ((++a) && (--b)) && (++c) ||(--a);
    printf("%d", d);
}
```

A. 0
B. 1
C. −1
D. 2

https://gateoverflow.in/373091/go-classes-2024-weekly-quiz-15-programming-question-7

Answer: A

GO Classes 2024 | Weekly Quiz 15 | Programming | Question: 8

11

Consider a function is_greater() given below. Mark all option(s) which return 1.

```
int is_greater(unsigned int x, unsigned int y)
{
    if(x-y > 0)
        return 1;
    else
        return 0;
}
```

x - y

unsigned numbers

A. is_greater$(1, 2)$
B. is_greater$(-1, -2)$
C. is_greater$(-2, -1)$
D. is_greater$(-1, 0)$

GO Classes 2024 | Weekly Quiz 15 | Programming | Question: 9

5

As shown below, the file $f.c$ defines a function f whose code refers to the variable x that is not a local variable or a parameter. The file $g.c$ defines a function g whose code refers to the variable x that is not a local variable or a parameter.

```
// file f.c
// declaration for x

void f(int a){
    ...
    x = ...
}
```

```
// file g.c
// declaration for x

void g(char* p){
    ...
    x = ...
}
```

https://gateoverflow.in/404469/go-classes-2024-weekly-quiz-15-programming-question-9

The following table below shows how the variable x is defined in each file. For each row in the table, indicate in Column (c) whether the two functions at run-time refer to the SAME identifier (memory location) or to DIFFERENT identifiers (memory locations)

Column A declaration in f.c	Column B declaration in g.c	Column C SAME or DIFFERENT
int x;	extern int x;	SAME
int x = 0;	static int x;	Diff
static int x;	static int x;	Diff
static int x;	extern int x = 0;	Diff

The first row of column C has been filled for hints. What will be in the 2nd, 3rd, and 4th row of Column C, respectively?

A. SAME, DIFFERENT, DIFFERENT
B. SAME, SAME, SAME
C. DIFFERENT, DIFFERENT, DIFFERENT
D. DIFFERENT, SAME, DIFFERENT

Answer: C

GO Classes 2024 | Weekly Quiz 15 | Programming | Question: 10

Consider the below program written into 2 files.

8

Can you link this to someone?

f1.c

```c
#include <stdio.h>
extern int x;

void fun(){
    printf("%d", x);
}
```

f2.c

```c
#include <stdio.h>

static int x;
void fun();

main() {
    fun();
    printf("%d", x);

}
```

Note that compilation of f1.c and f2.c happens independently of each other.

Which of the following is TRUE?

A. f1.c and f2.c can be compiled independently.

B. f1.c will produce a compilation error since variable x does not get any memory, and we are using it in printf.

C. f1.c and f2.c can be compiled and linked. The output of the program will be 00.

D. f2.c will produce a compilation error since function fun() is not defined in f2.c.

14

Answer: A

A: Extern variable is just a declaration whose definition is looked for during linking phase. So compiling both files individually causes no issues.

B: This is true that x does not get any memory because this is just a declaration, however this will never cause compilation error. This **may** get linker error later on.

C: These can be compiled but can not be linked because in f2.c the definition of variable x is of type static, and static variables are not available to the linker. So the x which f1.c was looking for is never found.

D: Since the prototype of fun() is available with f2.c there will never be compilation error. Again there **may** be linker error later on if the definition is not found.

answered Apr 24, 2022 • edited Sep 13, 2022 by **shadymademe**

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9

Let the variables x, y, and z, be of type int and assigned some values. The variable $b1$ is initialized as follows:

```
int b1 = (x > z) && (y >= z);
```

Variables b2, b3, b4, and b5 are initialized below.

```
int b2 = (x <= z) || (y < z)
int b3 = !((x < z) || (y <= z))
int b4 = !((x < z) && (y >= z))
int b5 = ((x > z) && (y > z)) || ((x > z) && (y == z))
```

Variables $b2$, $b3$, $b4$, and $b5$ ALWAYS, SOMETIMES, or NEVER takes the same value as $b1$. Which of the variable(s) SOMETIMES takes the same value as $b1$?

A. $b2$
B. $b3$
C. $b4$
D. $b5$

$$\overline{P \wedge Q} = \overline{P} \vee \overline{Q}$$

GO Classes 2024 | Weekly Quiz 15 | Programming | Question: 11

9

Let the variables x, y, and z, be of type int and assigned some values. The variable $b1$ is initialized as follows:

```
int b1 = (x > z) && (y >= z);
```

$b_2 = !\, b_1$

Variables b2, b3, b4, and b5 are initialized below.

```
int b2 = (x <= z) || (y < z)
int b3 = !((x < z) || (y <= z))
int b4 = !((x < z) && (y >= z))
int b5 = ((x > z) && (y > z)) || ((x > z) && (y == z))
```

NEVER same as b_1

Variables $b2$, $b3$, $b4$, and $b5$ ALWAYS, SOMETIMES, or NEVER takes the same value as $b1$. Which of the variable(s) SOMETIMES takes the same value as $b1$?

A. $b2$
B. $b3$
C. $b4$
D. $b5$

$\overline{P \wedge Q}$

$= \bar{P} \vee \bar{Q}$

```
int b1 = (x > z) && (y >= z);
```

$!\, b_1 = !\,((x > z) \;\&\&\; (y >= z))$

$= x \leq z \;||\; y < z$

$= b_2$

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$\{ b_1 \neq b_3 \quad b_1 \neq !b_3 \}$

```
int b1 = (x > z) && (y >= z);
```

```
int b3 = !((x < z) || (y <= z))
```

$= x \geq z \quad \&\& \quad y > z$

$b_1 = x \geq z \quad \&\& \quad y \geq z$

$b_3 = x \geq z \quad \&\& \quad y > z$

for $x = z$ AND $y \geq z$

$b_3 = T \qquad b_1 = F$

for $x > z$, $y \geq z$ both are true

$[b_1 \neq b_3 \quad b_1 \neq !b_3]$

```
int b1 = (x > z) && (y >= z);
```

$x > z$
$y > z$
} b_1 true, b_4 true

```
int b4 = !((x < z) && (y >= z))
```

$b_4 = x \geq z \;||\; y < z$

$y < z$ } b_1 false, b_4 true

```
int b1 = (x > z) && (y >= z);
```

$b_5 = b_1$

always Same

```
int b5 = ((x > z) && (y > z)) || ((x > z) && (y == z))
```

$(x>z)$ && $(y>z \;||\; y==z)$

$b_5 =$ $(x>z)$ && $(y \geq z)$

$a \geq b \Rightarrow a > b$ T/F

$a \geq b \Rightarrow a == b$ T/F

$a \geq b \Leftrightarrow a > b$ OR $a == b$ T/F

$b2$ **NEVER** takes the same value as $b1$.

$b3$ **SOMETIMES** takes the same value as $b1$.

$b4$ **SOMETIMES** takes the same value as $b1$.

$b5$ **ALWAYS** takes the same value as $b1$.

ANSWER : – B, C

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4

Consider the following variable and function definitions:

```
int g=10;
int q3() {
    static int g=5;
    return ++g;
}
int q4() {
    extern int g;
    return ++g;
}
int q5() {
    int g=1;
    return ++g;
}
```

What is the value of the expression $q3() + q3() + q4() + q4() + q5() + q5()$?

A. 32
B. 34
C. 38
D. 40

https://gateoverflow.in/373089/go-classes-2024-weekly-quiz-15-programming-question-12

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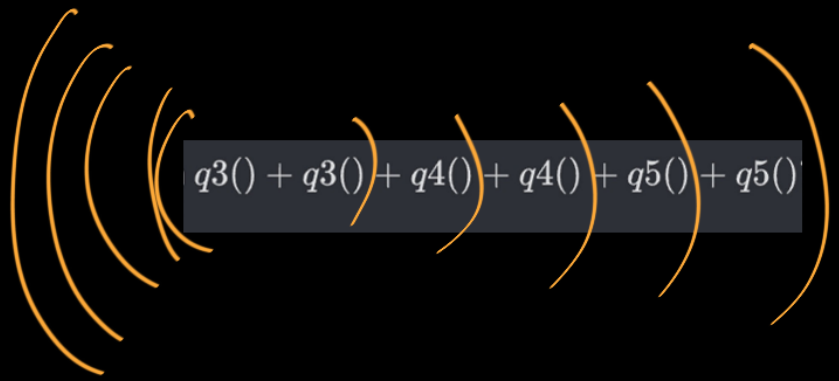
$q3() + q3() + q4() + q4() + q5() + q5()$

$3+4-5 = (3+4)-5$

$q3() + q3() + q4() + q4() + q5() + q5()$ =



Answer: D

9

The statement

```
while ( --counter >= 1 )
counter % 2 ? printf("A") : printf("B");
```

can NOT be rewritten as

A.

```
while ( --counter >= 1 )
    if ( counter % 2 )
        printf("A");
    else
        printf("B");
```

B.

```
while ( counter >= 1 )
    if (counter % 2)
        printf("A");
    else
        printf("B");
--counter;
```

Counter = 1 ← given expression in question won't print anything

it will print B

C.

```
while ( counter > 1 )
{
    --counter;
    if ( counter % 2 )
        printf("A");
    else
        printf("B");
}
```

2, 3, 4, 5, ...

```
while ( --counter >= 1 )
counter % 2 ? printf("A") : printf("B");
```

2, 3, 4, 5. . . .

D.

```
do
{
    --counter;
    printf( counter % 2 ? "A" : "B" );
} while ( counter >= 2 );
```

Counter = 1

✗ question won't print anything

D will print A

Answer : **B, D**

20

Consider the following two $.c$ files which both include the same $.h$ file:

```
// a.h
(1)     int inc(int x) { return x + 1; }
(2)     int x;
(3)     int y;
(4)     int z;
(5)     void b(void);
```

```
// a.c
#include "a.h"
#include <stdio.h>

(6)     int y = 1;
(7)     int w;
(8)     int v = 5;

int main()
{
    x = inc(0);
    z += 4;
    b();
    printf("x = %d y = %d z = %d "
           "w = %d v = %d\n",
            x, y, z, w, v);
    return 0;
}
```

```
// b.c
#include "a.h"

(9)     int w = 4;
(10)    int v = 5;

void b() {
    x = inc(x);
    y++;
    z--;
    v++;
}
```

static

extern

When compiled, linked, and executed, the following output results:

$x = 1\ y = 2\ z = 3\ w = 4\ v = 5$

Assuming that this program compiled and linked successfully, and based on the output shown above, add static and/or extern modifiers to the blank lines (1) through (10).

Leave them blank if neither modifier would be appropriate.

https://gateoverflow.in/373090/go-classes-2024-weekly-quiz-15-programming-question-14

Consider the following two $.c$ files which both include the same $.h$ file:

```
// a.h
(1)         int inc(int x) { return x + 1; }
(2)         int x;
(3)         int y;
(4)         int z;
(5)         void b(void);
```

```
// a.c
#include "a.h"
#include <stdio.h>

(6)         int y = 1;
(7)         int w;
(8)         int v = 5;

int main()
{
    x = inc(0);
    z += 4;
    b();
    printf("x = %d y = %d z = %d "
           "w = %d v = %d\n",
            x, y, z, w, v);
    return 0;
}
```

```
// b.c
#include "a.h"

(9)         int w = 4;
(10)        int v = 5;

void b() {
    x = inc(x);
    y++;
    z--;
    v++;
}
```

When compiled, linked, and executed, the following output results:
$x = 1\ y = 2\ z = 3\ w = 4\ v = 5$
Assuming that this program compiled and linked successfully, and based on the output shown above, add static and/or extern modifiers to the blank lines (1) through (10).

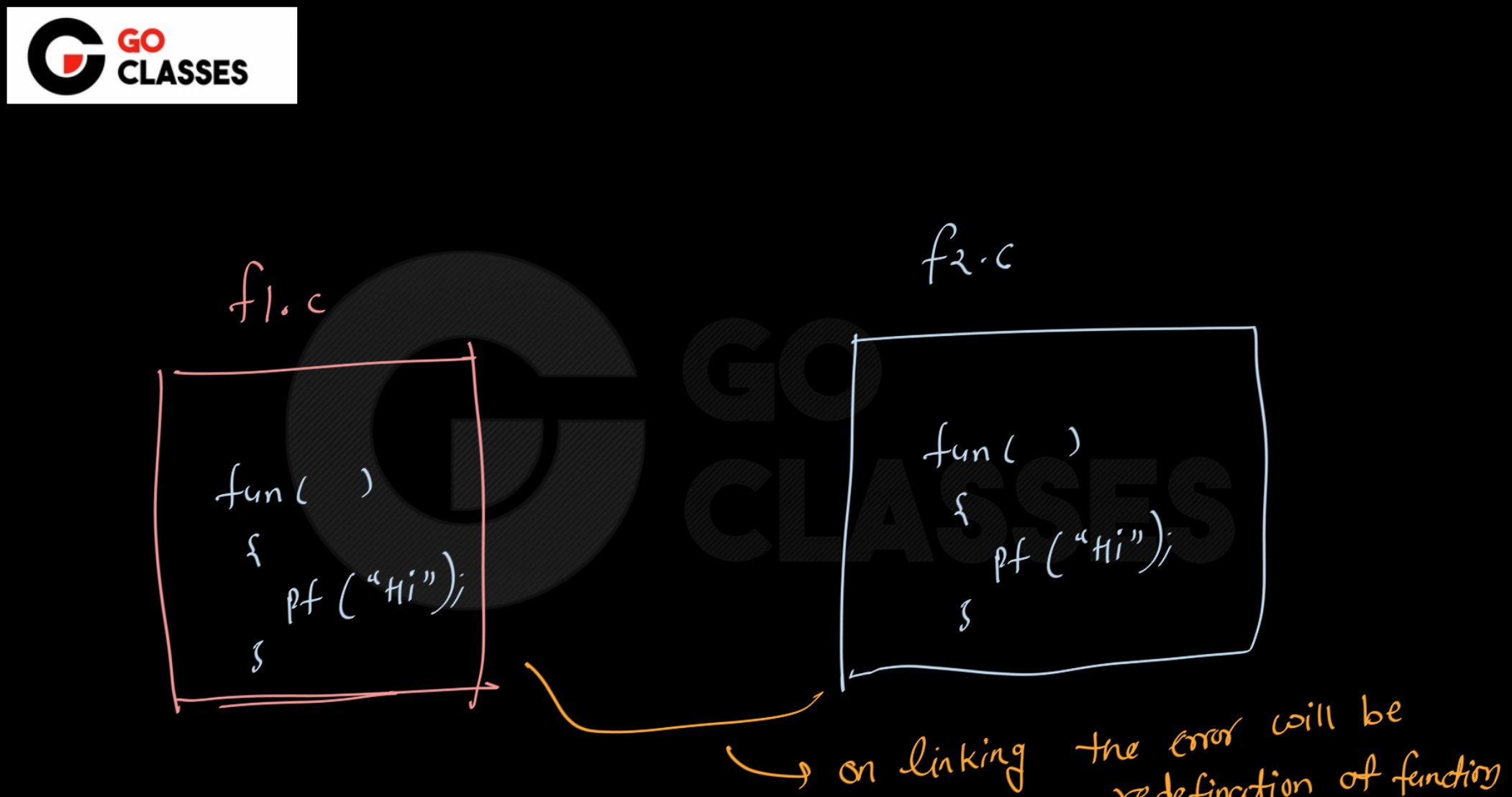
Leave them blank if neither modifier would be appropriate.

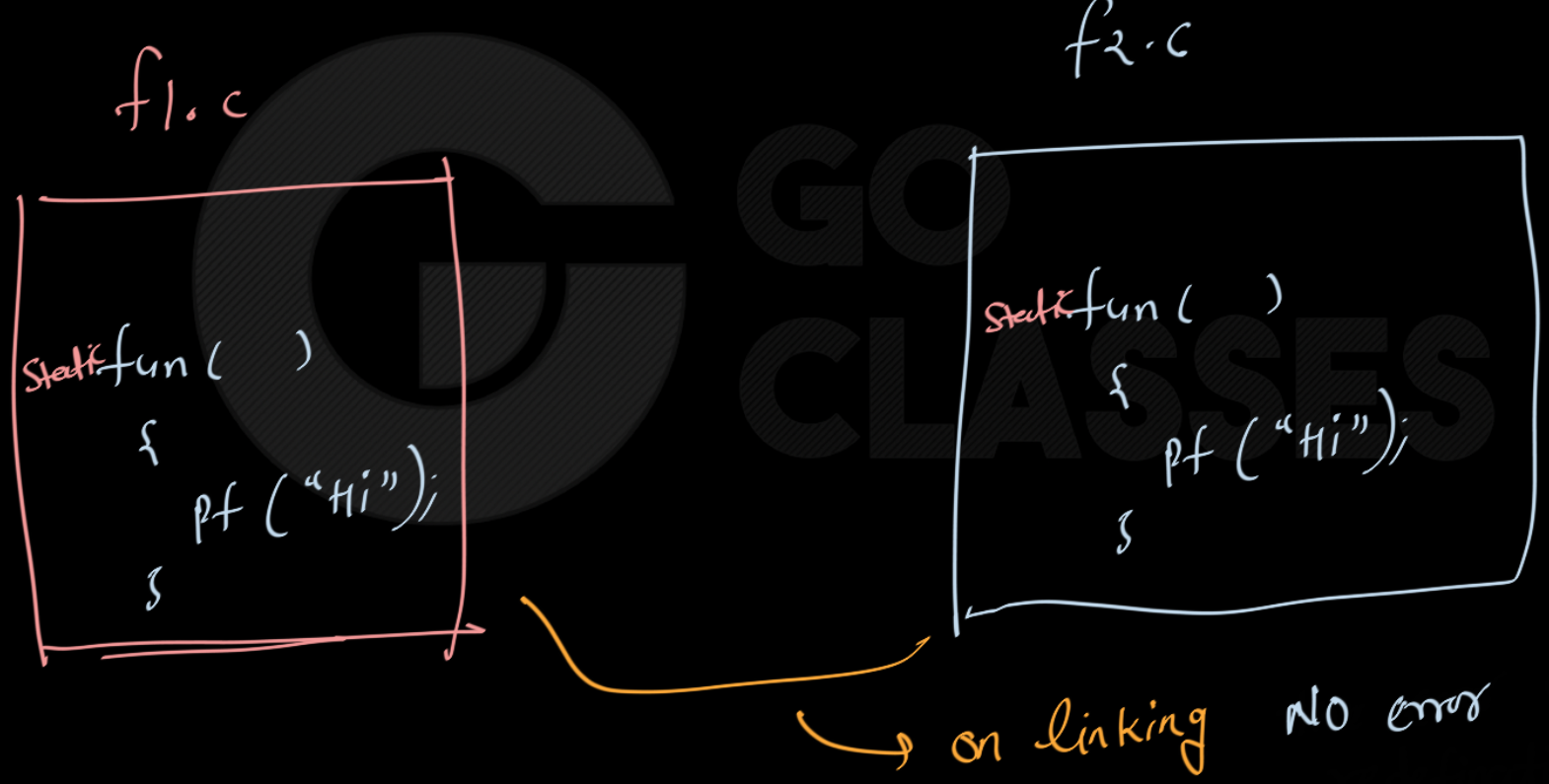
B.
- ~~Line(1)~~ – static
- Line(2) - static
- Line(3) - extern
- Line(4) - empty
- Line(5) – extern
- Line(6) - empty
- Line(7) - extern
- ~~Line(8)~~ - static
- Line(9) - empty
- Line(10) - static

aditya to Everyone 8:43 PM

Sir a/c to K&R C tentative definition will be merged

Because of line 4 in modern compilers it will have linker error: multiple definitions of z but a/c to K&R C it should compile.
And we can force K&R C behaviour in modern compilers by using -fcommon flag


f1.c
fun( )
{
pf("Hi");
}
f2.c
fun( )
{
pf("Hi");
}
on linking the error will be
redefinition of function


f1.c
static fun ( )
{
pf ("Hi");
}
f2.c
static fun ( )
{
pf ("Hi");
}
on linking NO error

For example, if we say line (2) is static then we consider line (2) as "static int x". Or if we say line (9) is empty then we treat line 9 as "$\text{int w} = 4$".

A.

Line(1) – empty
Line(2) - static
Line(3) - empty
Line(4) - extern
Line(5) – empty
Line(6) - empty
Line(7) - empty
Line(8) - static
Line(9) - empty
Line(10) - static

B.

Line(1) – static
Line(2) - static
Line(3) - extern
Line(4) - empty
Line(5) – extern
Line(6) - empty
Line(7) - extern
Line(8) - static
Line(9) - empty
Line(10) - static

C.

Line(1) – static
Line(2) - static
Line(3) - empty
Line(4) - empty
Line(5) – empty
Line(6) - empty
Line(7) - empty
Line(8) - static
Line(9) - empty
Line(10) - static

D.

Line(1) – empty
Line(2) - static
Line(3) - empty
Line(4) - empty
Line(5) – extern
Line(6) - empty
Line(7) - empty
Line(8) - static
Line(9) - empty
Line(10) - static

Answer : **B**

GO Classes 2024 | Weekly Quiz 15 | Programming | Question: 15

8

Professor Greg wants to give assignments to his students to write a C program for the $\mathrm{XOR5}$ function. $\mathrm{XOR5}$ is a function that returns true if and only if $\mathrm{EXACTLY}$ one of the integers A and B is 5.

Using which of the following condition(s), $\mathrm{XOR5}$ can be implemented?

A. $(A == 5)! = (B == 5)$

B. $!(A == 5)! = !(B == 5)$

C. $(A == 5)?!(B == 5) : (B == 5)$

D. $((A == 5)||(B == 5)) \;\&\&\; !((A == 5) \;\&\&\; (B == 5))$

A==5 ↘ T

B==5 ↓

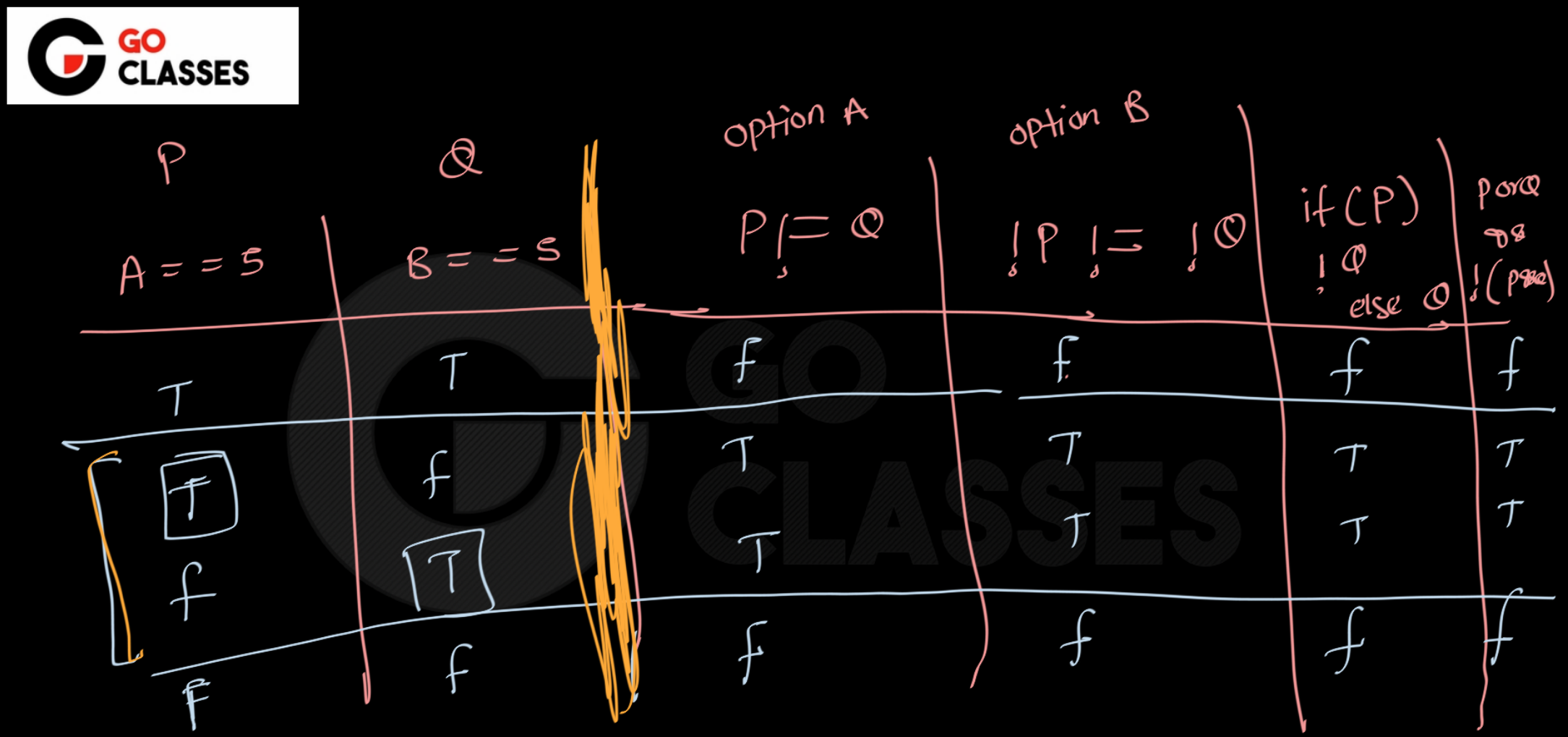
T != F

F != T

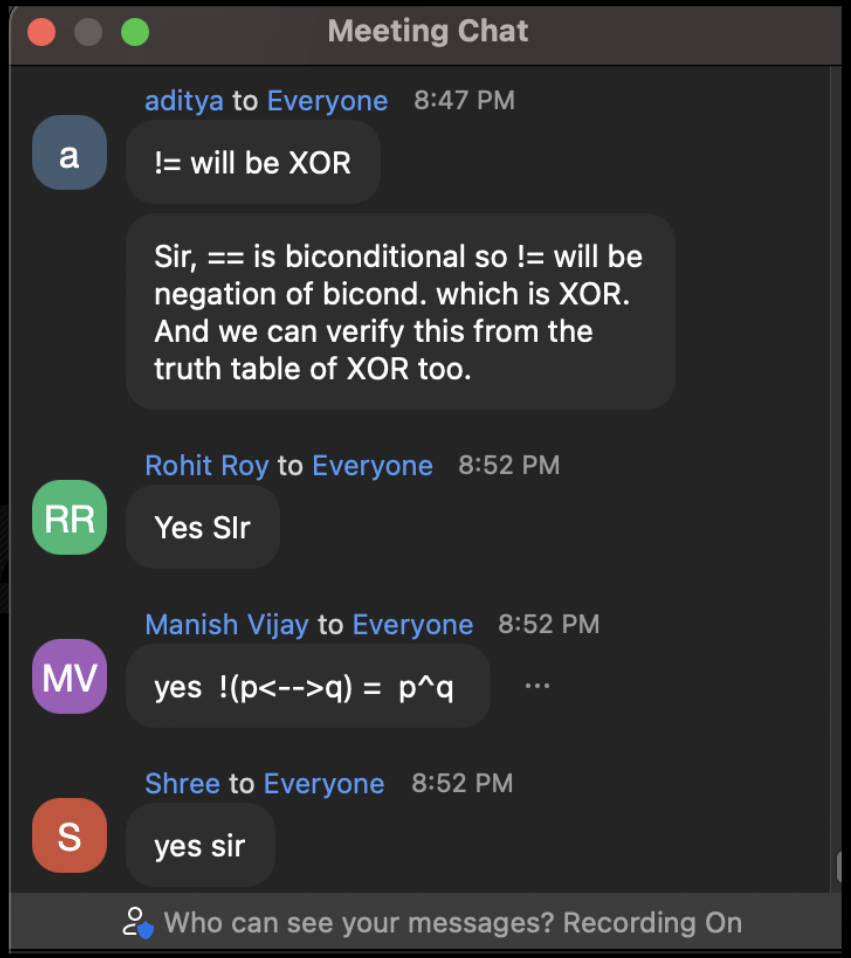
F [T != T

F != F]

https://gateoverflow.in/373095/go-classes-2024-weekly-quiz-15-programming-question-15


P
Q
option A
option B
A==5
B==5
P != Q
!P != !Q
if(P) !Q else Q
P or Q
!(P or Q)
T
T
f
f
T
f
T
f
T
T
T
T
T
T
T
f
f
f
f
f
f
f

Answer : A,B,C,D


Meeting Chat
aditya to Everyone 8:47 PM
a
!= will be XOR
Sir, == is biconditional so != will be negation of bicond. which is XOR. And we can verify this from the truth table of XOR too.
Rohit Roy to Everyone 8:52 PM
RR
Yes SIr
Manish Vijay to Everyone 8:52 PM
MV
yes !(p<-->q) = p^q
Shree to Everyone 8:52 PM
S
yes sir
Who can see your messages? Recording On

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int a[3][2][2]

GO CLASSES

int a[3][2][2]

int *p : p is a pointer to int

*p is an int

a[0][1]

sizeof(*a)

= 4 × 4

↑

sizeof(int)

= 16

a : is a pointer to 2D array of size 2×2

*a : is a 2D array of size 2×2

GO CLASSES

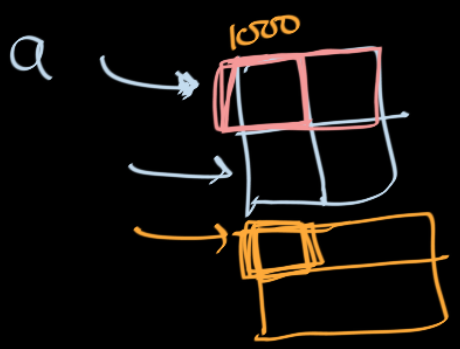
int a[3][2][2]

a : 3D array

*a : 2D array of size 2x2

**a : 1D array of size 2

a[0][1]



((a+0)+1)

**a

↳ an array of size 2.

*(*a + 1)

↳ 1000 + sizeof(**a)

↳ 8

sizeof(**a)

GO CLASSES

a: 3D array

*a : 2D array of size 2x2

**a : 1D array of size 2

think only when you need to think sizeof(something)

⇒ a

⇒ *a

⇒ **a

*(*a+1) ≡ *(1000 + sizeof(**a))

No. of integers x sizeof(int) = 2x4 = 8

a: 3D array or Pointer to 2D array of 2x2

*a : 2D array of size 2x2 or Pointer to 1D array of 2

**a : 1D array of size 2 or Pointer to one integer

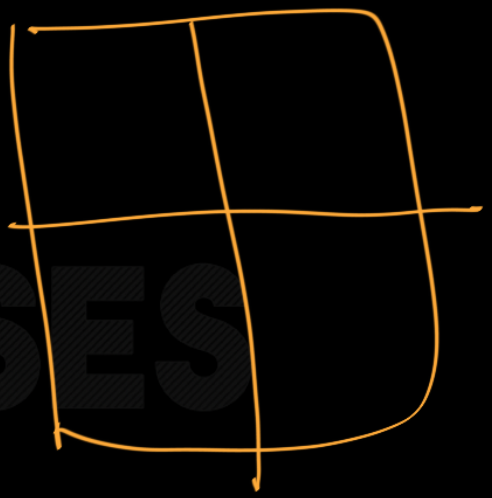
↓

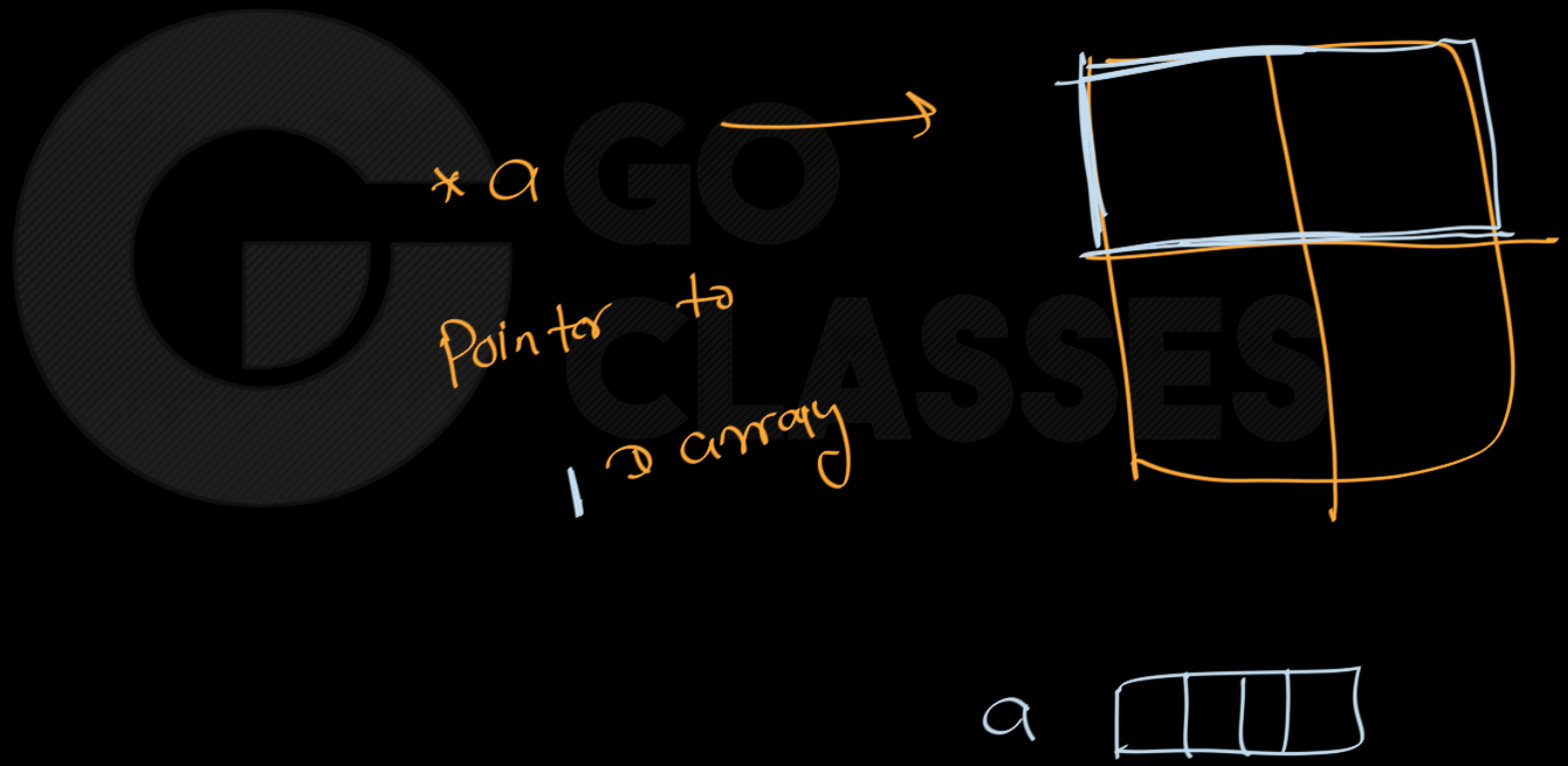
the real thing

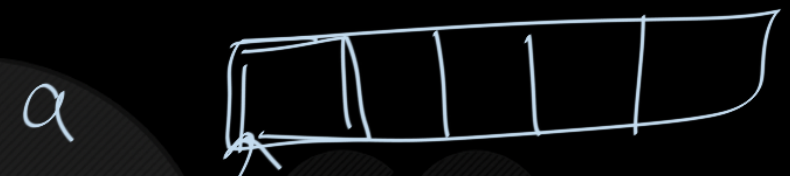
a is a 3D array

or

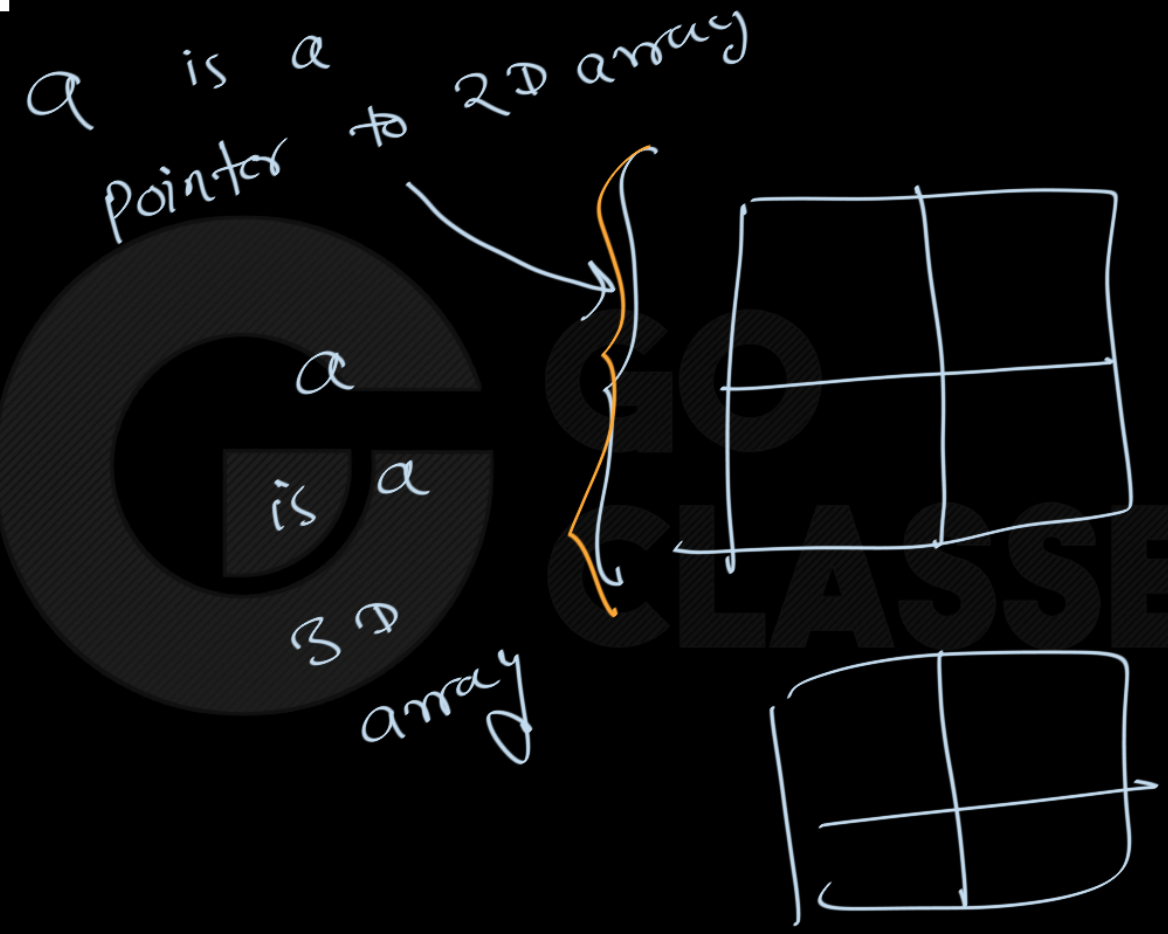
a Pointer to 2D array







a is pointer to one element


q is a
pointer to 2D array
a
is a
3D
array

GATE CSE 2003 | Question: 2

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Assume the following C variable declaration:

```
int *A[10], B[10][10];
```

Of the following expressions:

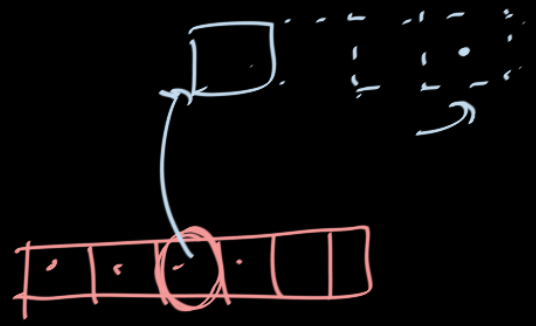
I. $A[2]$
II. $A[2][3]$
III. $B[1]$
IV. $B[2][3]$

which will not give compile-time errors if used as left hand sides of assignment statements in a C program?

A. I, II, and IV only
B. II, III, and IV only
C. II and IV only
D. IV only

gatecse-2003 programming programming-in-c easy pointers

B[1] it is an one D array



A[2] = Something

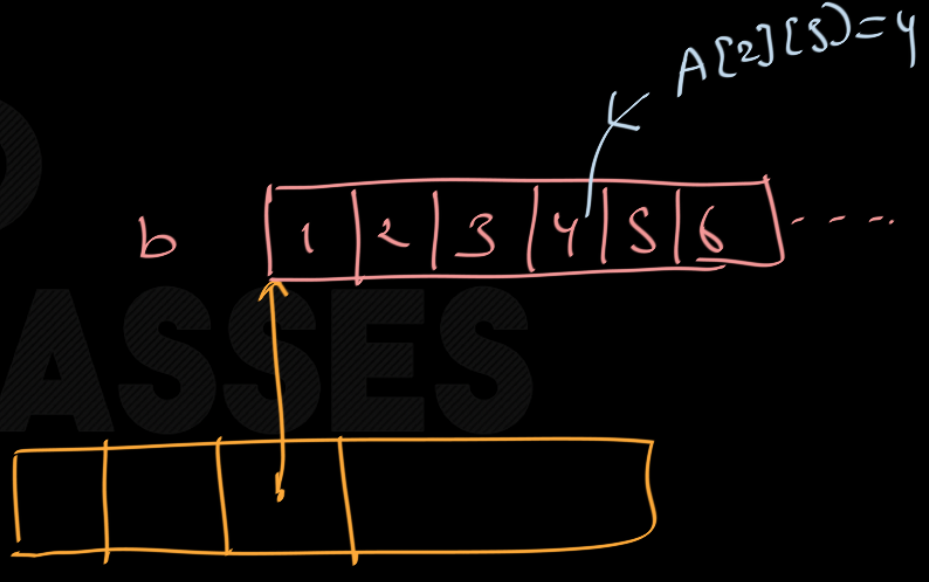
A[2][3] = Something

GO CLASSES

```
int b[10] = {1, 2, 3, 4, 5, 6};

int *A[10];

A[2] = b;
```



GO CLASSES

```
int   b;

int  *A[10];

A[2] = &b;

A[2][3] = 5;
```