



Weekly Quiz 17

C Programming



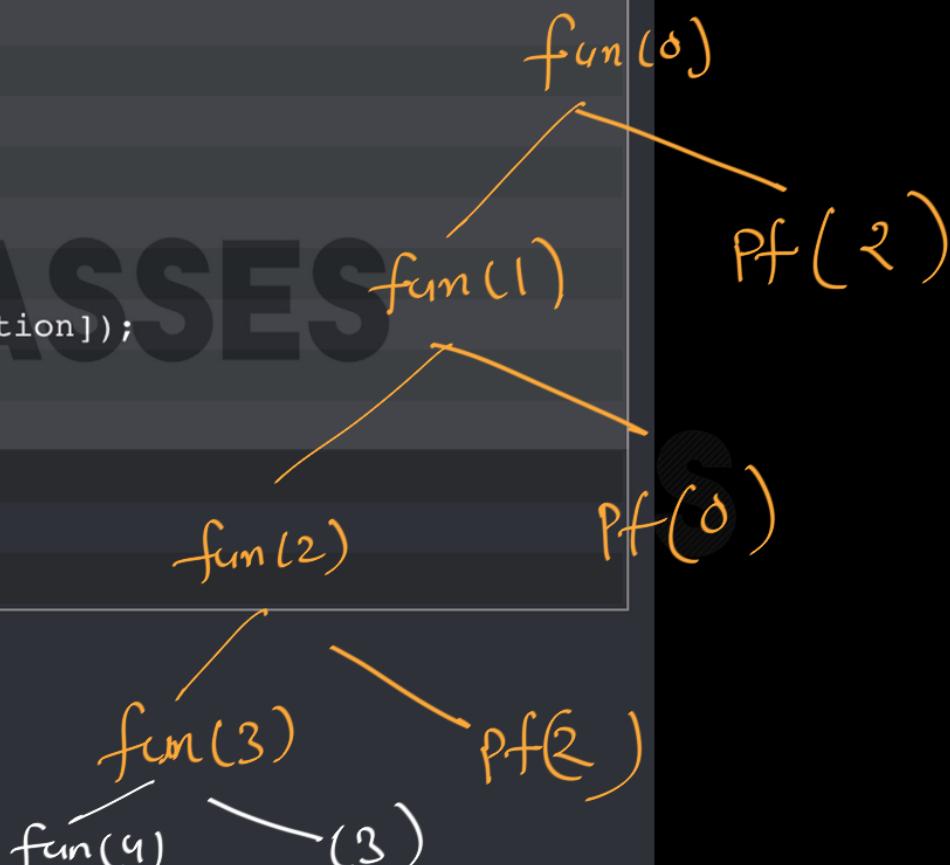
C Programming

GO Classes 2024 | Weekly Quiz 17 | Programming | Question: 1

```
char my_text[ ]= "2023 GATE";
void fun(int position)
{
    if (my_text[position] != ' ')
    {
        fun(position+1);
        printf("%c", my_text[position]);
    }
}
int main() {
    fun(0);
}
```

What will be the output of a given program ?

- A. 2023
- B. 3202
- C. ETAG3202
- D. ETAG



<https://gateoverflow.in/373487/go-classes-2024-weekly-quiz-17-programming-question-1>



C Programming

Answer B



GO Classes 2024 | Weekly Quiz 17 | Programming | Question: 2



5



Which of the following is/are valid assignment(s) of the pointer for the given declaration? An assignment is valid if both pointers are of the same type (pointers are compatible) and get successfully compiled with no warning or error.

```
int a[5] = {1, 2};  
int (*p)[5];
```

A. p = a;

B. p = &a;

C. p = *a;

D. p = **a;

P is a pointer to an array.





6



Option A: `p=a;` → Here `a` is a pointer to first element of array. `P` is a pointer to an array of 5 elements.



Best answer

Option B: `p=&a;` : `&a` is a pointer to whole array of 5 elements and `p` is also a pointer to array of 5 elements . so it is a valid statement.

Option C: `p=*a;` `P` is a pointer to whole array & `*a` is accessing first element of the array.

Option D: `p==*a;` : `**a` is not a legal statement since `*a` means that its accessing first element of array and `**a` does not mean anything. So it is not a valid statement.

answered May 3, 2022 • selected Dec 3, 2022 by Sachin Mittal 1

edit flag hide comment Follow

Pip Box Delete with Reason Wrong Useful

share this



prateek_hazard

B



C Programming

GO Classes 2024 | Weekly Quiz 17 | Programming | Question: 3



7



Which of the following is NOT a valid C program? A valid program is a program having no compile-time errors.

Program 1

```
auto int a;
main ()
{
    auto int b;
    for (b = 0; b < 10; b++)
    {
        auto int a = b;
    }
}
```

GO
CLASSES
'invalid'

Program 2

```
static int a;
main ()
{
    static int b;
    for (b = 0; b < 10; b++)
    {
        static int a = 1;
    }
}
```

Valid

Program 3

```
int a;  
main ()  
{  
    static int b;  
    for (b = 0; b < 10; b++)  
    {  
        static int a = 1;  
    }  
}
```

valid

Program 4

```
extern int a;  
main ()  
{  
    static int b;  
    for (b = 0; b < 10; b++)  
    {  
        static int a = 1;  
    }  
}
```

valid

- A. Program 1
- B. Program 2
- C. Program 3
- D. Program 4



7



In program 1, during compilation compiler sees auto int a; as a global variable and in auto int a we can say that we cannot declare auto int as a global variable since auto storage class is only used for variables which are defined locally and auto is not defined locally in this case.

In program 2, a is a static variable and we can define static globally and locally. We defined static variable b inside the main function and then we have for loop in which we have defined another variable of static storage class which in every iteration adds local a and upper block's b to it.

In program 3, a is a global variable . We defined static variable b inside the main function and then we have for loop in which we have defined another variable of static storage class which in every iteration adds local a and upper block's b to it.

In program 4, extern a is a reference to some variable a which is present somewhere else in this file or another file. We defined static variable b inside the main function and then we have for loop in which we have defined another variable of static storage class which in every iteration adds local a and upper block's b to it.

answered Apr 27, 2022

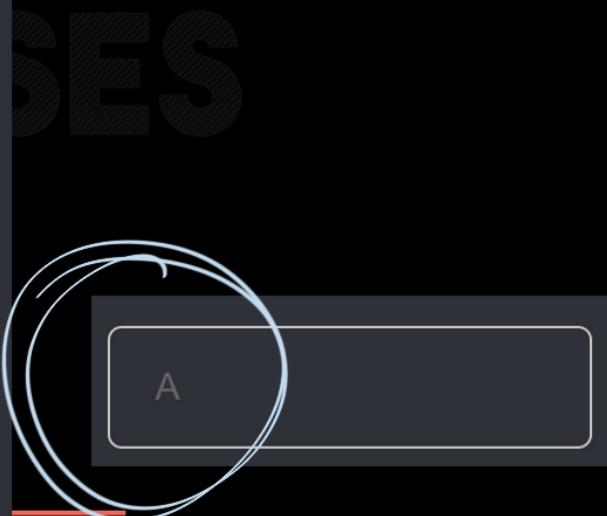
[edit](#) [flag](#) [hide](#) [comment](#) [Follow](#)

[Pip Box](#) [Delete with Reason](#) [Wrong](#) [Useful](#)

[share this](#)



prateek_hazard





GO Classes 2024 | Weekly Quiz 17 | Programming | Question: 4



6



Which of the following is/are TRUE about storage classes in C programming

- A. static local variables are NOT available to the linker. T
- B. static global variables are available to the linker. F
- C. extern local variables are available to the linker. T
- D. extern global variables are NOT available to the linker. F

goclasses2024_wq17

goclasses

programming

programming-in-c

storage-classes-in-c

multiple-selects

1-mark

<https://gateoverflow.in/374465/go-classes-2024-weekly-quiz-17-programming-question-4>



C Programming

A:C



Aditya to Everyone 8:18 PM

A

Sir, I have a doubt in this question for options C & D.

In C, what do you mean by extern local variable? Local variables can't be extern, right? And if you mean the local declaration then in the following program:

```
int main() {  
    extern int x;  
    // no mention of x again  
    ...  
}
```

This x is not available to the linker because it doesn't even have any memory.

For option D:

```
extern int x;  
int main() {  
    // x is not used anywhere  
    ..  
}
```


// no definition of x and this is the only file present

Sir, in this program too the variable x is not available to the linker, right?

we want to link it to global variable



GO Classes 2024 | Weekly Quiz 17 | Programming | Question: 5



5



The default storage class for functions in C language is –

- A. Static
- B. Auto
- C. Extern
- D. None of these

goclasses2024_wq17



programming

programming-in-c

storage-classes-in-c

1-mark

<https://gateoverflow.in/374463/go-classes-2024-weekly-quiz-17-programming-question-5>



C Programming

C





GO Classes 2024 | Weekly Quiz 17 | Programming | Question: 6



5



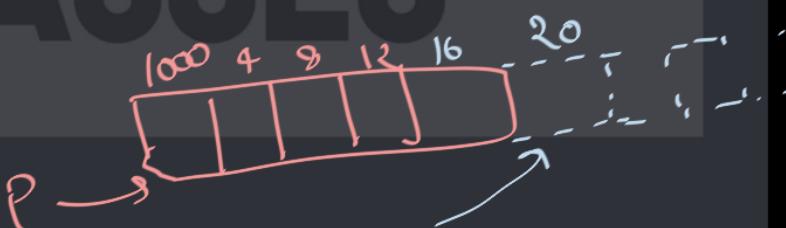
Consider the following declaration of pointer variable p .

```
int (*p)[5];
```

If the initial value of p is 1000, then what will be the value of $p + 1$?

It is given that the system has 8 bytes of address size and 4 bytes of integer size.

- A. 1001
- B. 1004
- C. 1020
- D. 1008



goclasses2024_wq17



programming

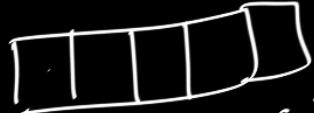
programming-in-c

array-of-pointers

1-mark

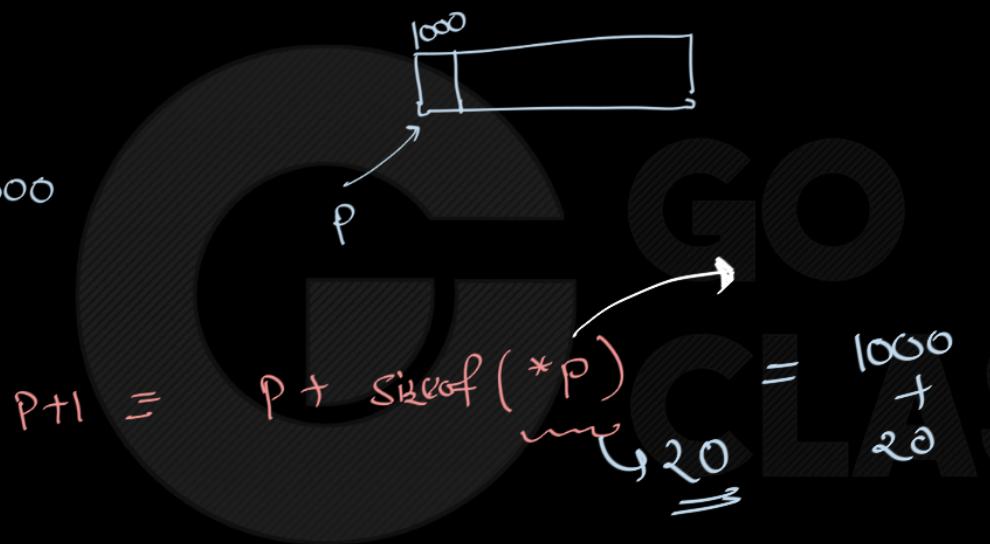
<https://gateoverflow.in/374736/go-classes-2024-weekly-quiz-17-programming-question-6>

www.goclasses.in

α 
 $\text{sizeof}(\alpha) = 5 \times \text{sizeof(int)}$
 $= 20$

`int (*P)[5];`

$P \equiv 1000$



P : is a pointer to an array

$*P$: is an array

$*P$, pointing to first element of array

`int *t;`

t : pointer to int
 $*t$, int

int (*P)[5];

P == 1000

P+1 =

P + sizeof(*P)
20 = 1000 + 20

= 1020





$\text{sizeof } (*p) = 20$

$\text{sizeof } (p) = 8 \hookrightarrow \text{address size}$



GO Classes 2024 | Weekly Quiz 17 | Programming | Question: 7



3



What will be the output of the given C code?

```
#include<stdio.h>
#include<stdlib.h>
int main(){
    int x, t[4] = {1,3,4,5};
    int *p, **pp;
    p = t;
    pp = &p;
    printf("%d ", *p);
    printf("%d ", **pp+1);
    printf("%d", *(*pp+1));
}
```

- A. 1 3 4
- B. 1 3 3
- C. 1 2 3
- D. 1 2 2



C Programming

C



GO Classes 2024 | Weekly Quiz 17 | Programming | Question: 8



6



Which of the following function declaration can be passed to the following array?

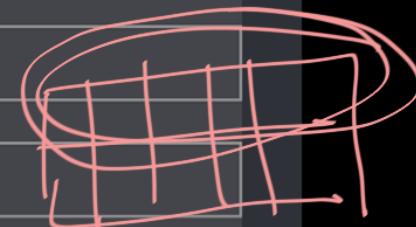
```
char myArray[3][4];
```

A. void fun(char a[][] , int size);

B. void fun(char a[][4] , int size);

C. void fun(char [3][] , int size);

D. void fun(char [][]a , int size);



goclasses2024_wq17

goclasses

programming

programming-in-c

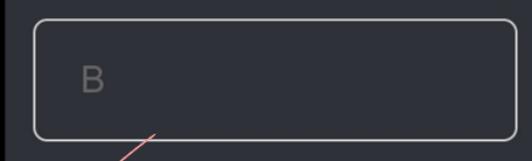
array

1-mark

<https://gateoverflow.in/373499/go-classes-2024-weekly-quiz-17-programming-question-8>



C Programming





GO Classes 2024 | Weekly Quiz 17 | Programming | Question: 9



9



Which of the following(s) are true for following function

```
int mystery(int a) {  
    if(a == 256) return 3;  
    return 1 + 2 * mystery(a*4); //line 3  
}
```

- A. mystery(255) is an example of infinite recursion
- B. if we replace line 3 by following line return 1 + mystery(a*4)+ mystery(a*4); then also output is same
- C. Only possible outputs are 3, 7, 15, 31
- D. mystery(i) gives output if and only if i is 1 or multiple of 4

goclasses2024_wq17



programming

programming-in-c

recursion

multiple-selects

1-mark

<https://gateoverflow.in/373088/go-classes-2024-weekly-quiz-17-programming-question-9>

www.goclasses.in



C Programming

A;B

```
int mystery(int a) {  
    if(a == 256) return 3;  
    return 1 + 2 * mystery(a*4); //line 3  
}
```

$$\text{mystery}(256) \Rightarrow 3$$

$$256/4 = 64$$

$$\text{mystery}(64) \Rightarrow 1 + 2 \times 3 = 7$$

$$\text{mystery}(16) \Rightarrow 1 + 2 \times \text{mystery}(8) = 15$$

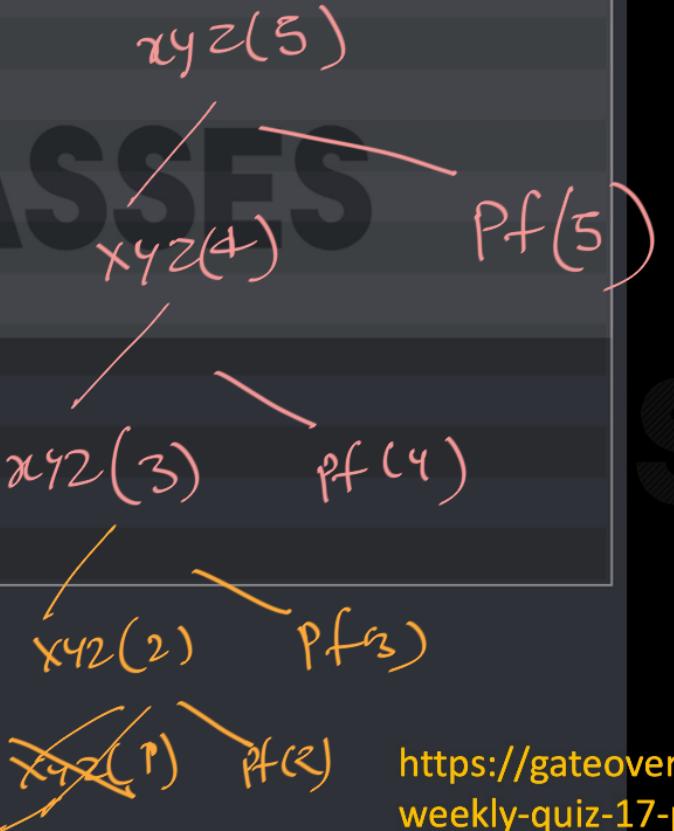
$$\begin{aligned} 256 &\rightarrow 3 \\ 64 &\rightarrow 7 \\ 16 &\rightarrow 15 \\ 8 &\rightarrow 31 \\ 4 &\rightarrow 63 \\ 2 &\rightarrow 63 \end{aligned}$$

5

What will be output of following program?

```
void xyz(int i)
{
    if(--i)
    {
        xyz(i++);
        printf("%d", i);
    }
}
main()
{
    xyz(5);
}
```

- A. It is an infinite recursion since no base case
- B. 2345
- C. 54321
- D. 1234



<https://gateoverflow.in/373086/go-classes-2024-weekly-quiz-17-programming-question-10>



C Programming

B



GO Classes 2024 | Weekly Quiz 17 | Programming | Question: 11

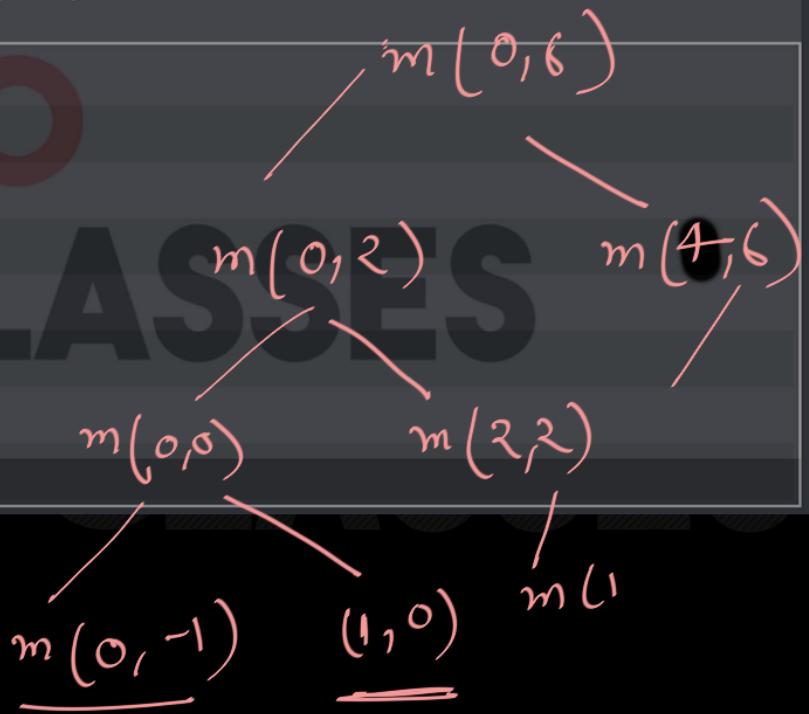


7



What will be the output printed by mystery1(0, 6)?

```
void mystery1(int a, int b) {  
    if (a <= b) {  
        int m = (a + b) / 2;  
        printf("%d", m);  
        mystery1(a, m-1);  
        mystery1(m+1, b);  
    }  
}
```



<https://gateoverflow.in/373085/go-classes-2024-weekly-quiz-17-programming-question-11>

3 10 2 5



C Programming

3102546





GO Classes 2024 | Weekly Quiz 17 | Programming | Question: 12



8



```
char *strcollection[ 3 ]= {"GOClasses", "GATEOverflow", "IISc"};
```

For the above declaration, consider base addresses of strcollection, "GOClasses", "GATEOverflow" and "IISc" are 1000, 2000, 3000 and 4000 respectively.

What will be value of strcollection+1?

Assume character is of one bytes, integer is of two bytes and address is of four bytes.

goclasses2024_wq17

goclasses

programming

programming-in-c

array

array-of-pointers

numerical-answers

1-mark

<https://gateoverflow.in/373493/go-classes-2024-weekly-quiz-17-programming-question-12>

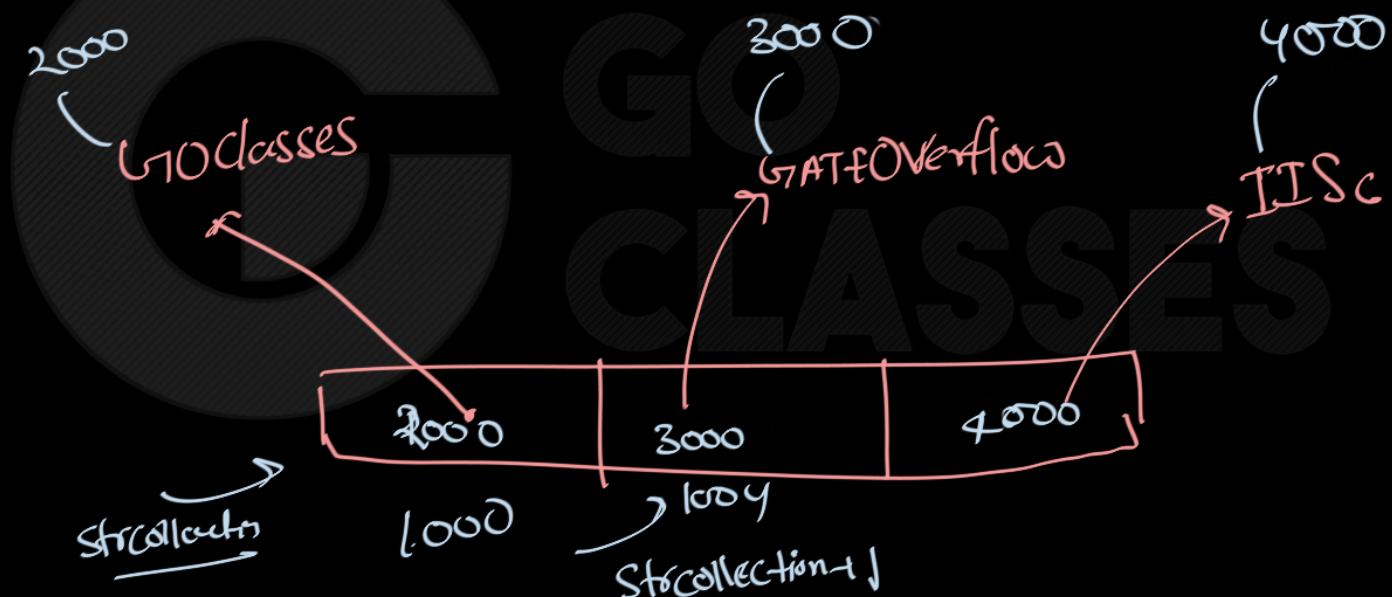
GO Classes 2024 | Weekly Quiz 17 | Programming | Question: 12



8



```
char *strcollection[ 3 ]= { "GOClasses", "GATEOverflow", "IISc" };
```



<https://gateoverflow.in/373493/go-classes-2024-weekly-quiz-17-programming-question-12>



C Programming

1004





GO Classes 2024 | Weekly Quiz 17 | Programming | Question: 13



5



Consider the following declaration of struct.

```
struct myst{  
    char a[20];  
    char *b;  
    struct myst *p;  
}x[2] = {"GATE", "Overflow", x+1, "GO", "Classes", x}, *p = x;
```

What will be the output of the following print statement?

```
printf("%s", p++->p->b++);
```

- A. Overflow
- B. Classes
- C. verflow
- D. lasses

goclasses2024_wq17

goclasses

programming

programming-in-c

structure

1-mark

<https://gateoverflow.in/374313/go-classes-2024-weekly-quiz-17-programming-question-13>



GO Classes 2024 | Weekly Quiz 17 | Programming | Question: 13



5



Consider the following declaration of struct.

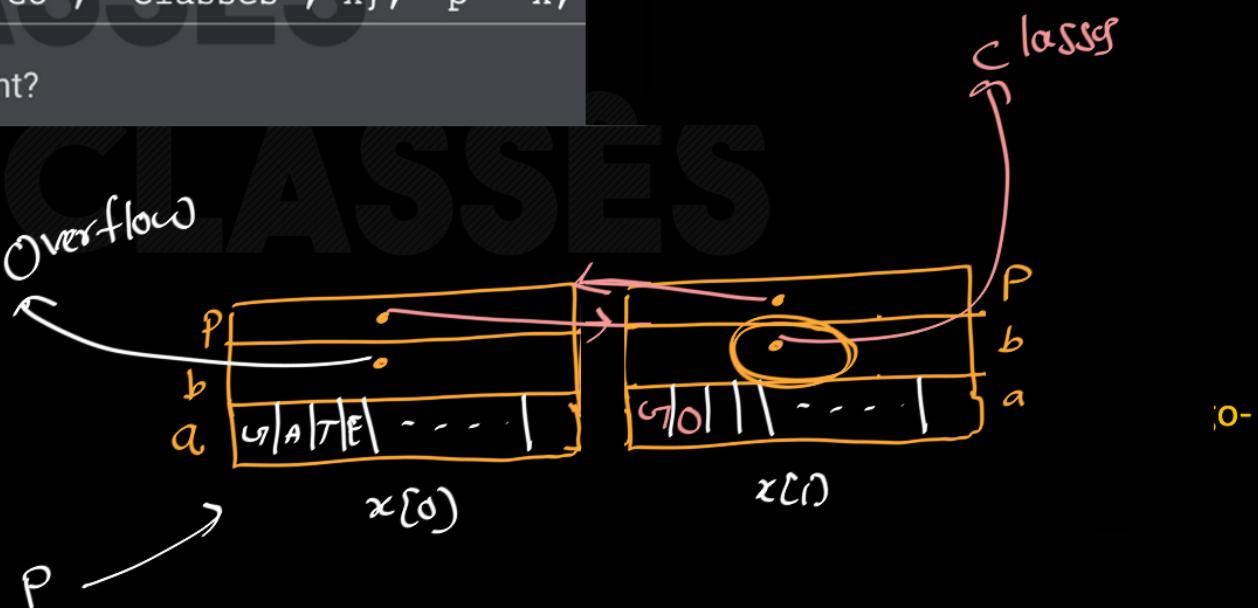
```
struct myst{  
    char a[20];  
    char *b;  
    struct myst *p;  
}x[2] = {"GATE", "Overflow", x+1, "GO", "Classes", x}, *p = x;
```

What will be the output of the following print statement?

```
printf("%s", p++->p->b++);
```

- A. Overflow
- B. Classes
- C. verflow
- D. lasses

$P \rightarrow P \rightarrow b$





C Programming

B





C Programming

GO Classes 2024 | Weekly Quiz 17 | Programming | Question: 14



7



```
main()
{
    char s[ ]= "jjtd\0abc", *p;

    for (p = s; *p; p++)
    {
        --(*p);
    }

    printf("%s", s);
}
```

What will be the output of a given program?

- A. iitb abc
- B. iisc abc
- C. iisc
- D. iitb

goclasses2024_wq17

goclasses

programming

programming-in-c

array

output

1-mark

skip

SES

<https://gateoverflow.in/373485/go-classes-2024-weekly-quiz-17-programming-question-14>



C Programming

C





GO Classes 2024 | Weekly Quiz 17 | Programming | Question: 15



5



The default storage class for global variables in the C language is –

- A. Static
- B. Auto
- C. Extern
- D. None of these



goclasses2024_wq17



programming

programming-in-c

storage-classes-in-c

1-mark

<https://gateoverflow.in/374462/go-classes-2024-weekly-quiz-17-programming-question-15>

Mark all options which are likely to create problems with memory, i.e., run time error or has a memory leak.

Assume that malloc is successful in all cases.

Program 1:

```
int *p = malloc(sizeof(int));
*p = 0;
free(p);
*p = 0;
```

Dangling pointer

Program 2:

```
int *p = malloc(sizeof(int));
*p = 0;
free(p);
p = 0;
```

No issue

Program 3:

```
int *p = malloc(3*sizeof(int));
*p = 0;
p++;
free(p);
```

undefined

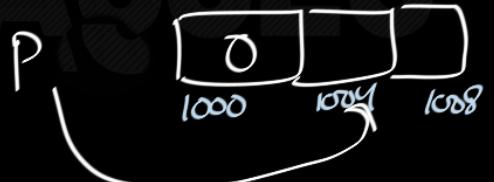
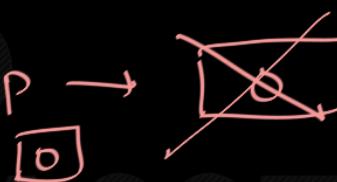
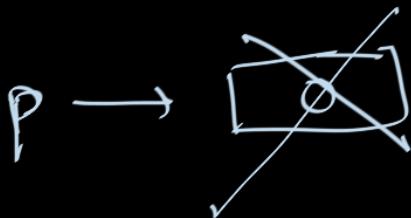
Runtime Error

Program 4:

```
int *p = malloc(sizeof(char));
*p = 0;
```

Runtime Error

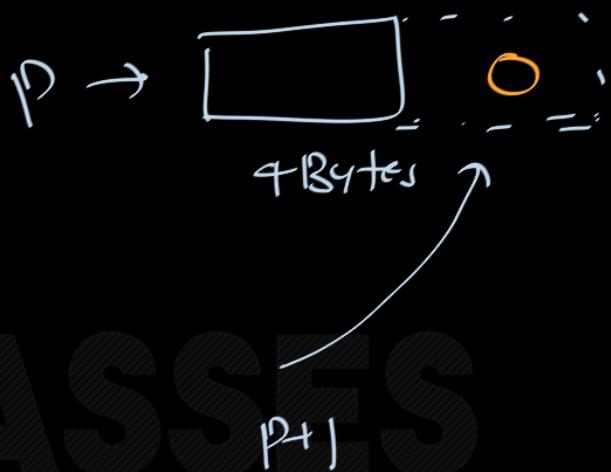
- A. Program 1
- B. Program 2
- C. Program 3
- D. Program 4



int *P = malloc(sizeof(int))

* $(P+1)$ = 0

run time error





C Programming

A;C;D





GO Classes 2024 | Weekly Quiz 17 | Programming | Question: 17

-  Based on the struct alignment discussed in class,
-  6 What are the sizes of foo1, foo2, foo3 and foo4 respectively?
-  Sizes of primitive data types are given below.

```
sizeof(int) = 4 bytes  
sizeof(short) = 2 bytes  
sizeof(char) = 1 byte
```

Optional

<https://gateoverflow.in/374310/go-classes-2024-weekly-quiz-17-programming-question-17>

```
struct foo1 {  
    int d1;  
    char c1;  
    int d2;  
};
```

12

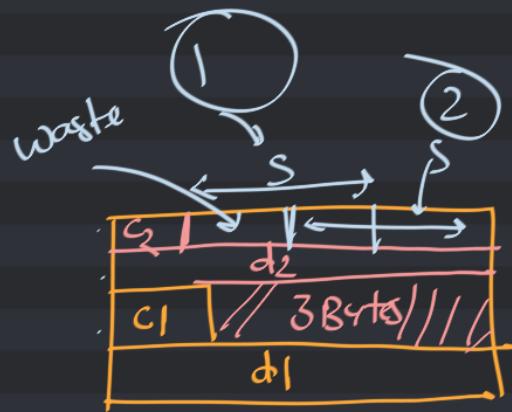


```
struct foo2 {  
    int d1; 4  
    char c1; 4  
    int d2; 4  
    char c2; 1 ] 4  
    short s;  
};
```

16

```
struct foo3 {  
    int d1;  
    int d2;  
    char c1;  
    char c2;  
    short s;  
};
```

12



```
struct foo4 {  
    char c1; 4  
    int d1; 4  
    short s; 4  
    int d2; 4  
    char c2; 4  
};
```

20

ming

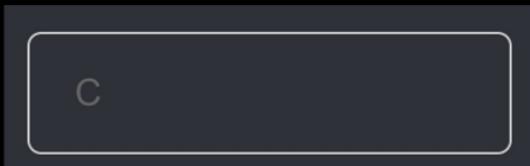
GO Classes

12, 16, 12, 20

- A. 9, 12, 12, 12
- B. 9, 12, 16, 20
- C. 12, 16, 12, 20
- D. 12, 20, 20, 20



C Programming



What will be the output of the following program?

```
struct s{  
    int i;  
    struct s *p;  
};  
struct s arr[4] = { 7, arr+3,  
    8, arr+2,  
    9, arr,  
    8, arr+1,  
};  
struct s *ap[] = {arr+3, arr+2, arr+1, arr};  
struct s **pp =ap;  
int main()  
{  
    printf("%d ", ap[++pp[2]->i-6]->i++);  
    printf("%d ", pp[1]++->p++->i);  
    printf("%d", ++arr[2].p->i);  
}
```

- A. 9 10 9
- B. 7 8 10
- C. 7 8 9
- D. None of these

<https://gateoverflow.in/374317/go-classes-2024-weekly-quiz-17-programming-question-18>

What will be the output of the following program?

```

struct s{
    int i;
    struct s *p;
};

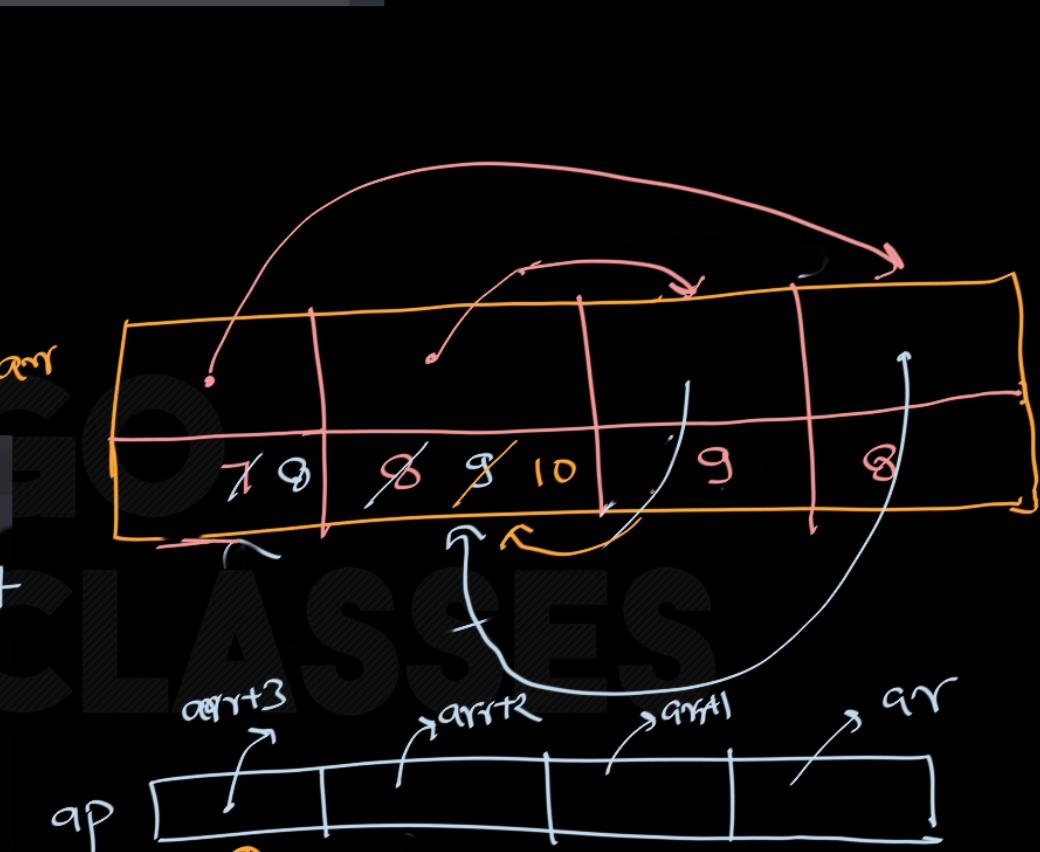
struct s arr[4] = { 7, arr+3,
                    8, arr+2,
                    9, arr,
                    8, arr+1,
};

struct s *ap[] = {arr+3, arr+2, arr+1, arr};
struct s **pp =ap;

int main()
{
    printf("%d ", ap[++pp[2]->i-6->i++]);
    printf("%d ", pp[1]++->p++->i);
    printf("%d", ++arr[2].p->i);
}

```

- A. 9 10 9
- B. 7 8 10
- C. 7 8 9
- D. None of these



<https://gateoverflow.in/374317/go-classes-2024-weekly-quiz-17-programming-question-18>



C Programming

B





C Programming

GO Classes 2024 | Weekly Quiz 17 | Programming | Question: 19



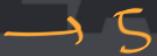
4



```
int mystry (char* str) {  
    if (*str == 0) {  
        return 0;  
    }  
    return mystry (str+1) +1;  
}
```

Recursive version of
strlen

What will be the output of mystry("hello")?



goclasses2024_wq17



programming

programming-in-c

recursion

numerical-answers

2-marks

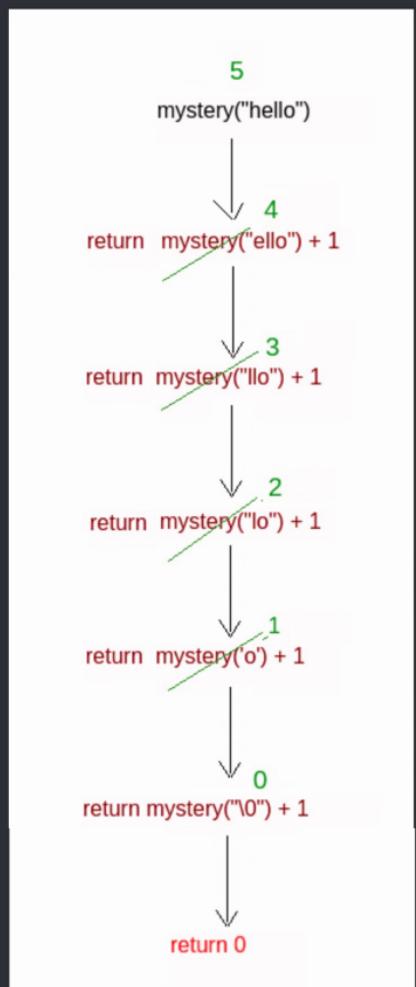
<https://gateoverflow.in/373483/go-classes-2024-weekly-quiz-17-programming-question-19>



www.goclasses.in

Answer: 5

The flow of function calls are given below



C Programming

GO Classes

answered Apr 7, 2022 • selected Apr 7, 2022 by Sachin Mittal 1

edit flag hide comment Follow

Pip Box Delete with Reason Wrong Useful



Shoto



www.goclasses.in



GO Classes 2024 | Weekly Quiz 17 | Programming | Question: 20



3



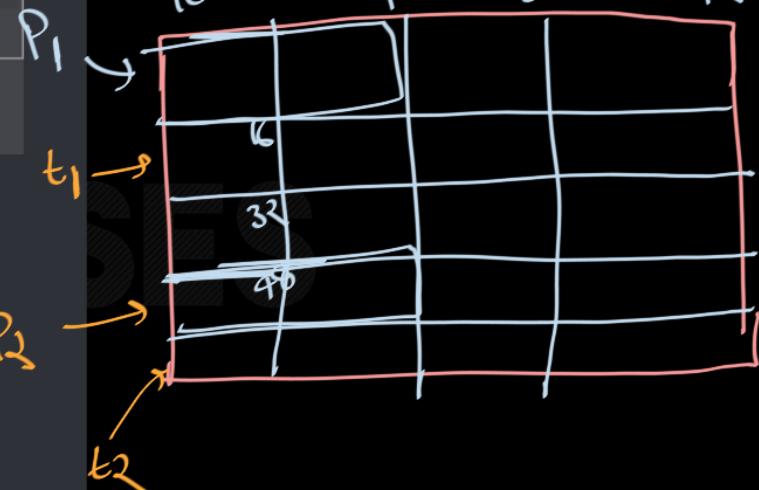
Consider the following declarations of variables in a system having 4 bytes for integers.

```
int a[5][4];
int (*p1)[2];
int (*p2)[2];
int (*t1)[4];
int (*t2)[4];
```

Suppose array a has base address of 1000 and initial values of p_1 , p_2 , t_1 and t_2 are 1000, 1048, 1016 and 1064 respectively. What will be the value of $p_2 - p_1$ and $t_2 - t_1$ respectively?

- A. 6 3
- B. 48 24
- C. 12 6
- D. 24 12

✓
6
↓
3



goclasses2024_wq17

goclasses

programming

programming-in-c

array

array-of-pointers

2-marks



p1 and p2 both are pointer to an integer array of size 2. p1 = 1000 and p2 = 1048

6

Thus, $p2 - p1 = (1048 - 1000) / \text{sizeof}(*p1) = 48 / (2*4) = 6$



t1 and t2 both are pointer to an integer array of size 4. t1 = 1016 and t2 = 1064



Thus, $t2 - t3 = (1064 - 1016) / \text{sizeof}(*t1) = 48 / (4*4) = 3$

<https://onlinegdb.com/UbKb88Ao8> refer this to see execution/output.

Answer :- A. 6 3

ES



GO
CLASSES



GO
CLASSES