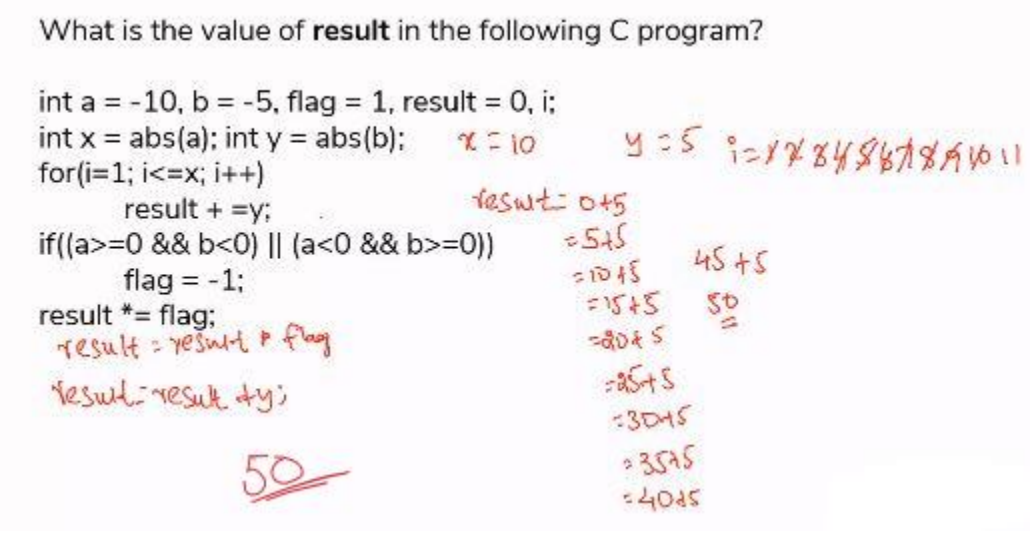
TCS NINJA - PROGRAMMING LOGIC SET 1

1. What is the value of **result** in the following C program?

```
int a = -10, b = -5, flag = 1, result = 0, i;
int x = abs(a); int y = abs(b);
for(i=1; i<=x; i++)
 result + =y;
if((a>=0 && b<0) || (a<0 && b>=0))
 flag = -1;
result *= flag;
```

Solution:



2. The following program is supposed to find the number of terms in the array num_array. What should be written in the missing last part before the while loop's closing brace?
P.S. In the actual TCS NQT, this would be a FUB question, where you must write your answer without any leading, trailing, interspersed blank spaces or semicolons.

```
int num_array[ ] = {17, 20, 23, 26, 29, 32, 35};
int count = 0;
while (count < sizeof(num_array/ num_array[0])
{
 printf("%d", num_array[count]);
```

//Replace this commented line with the required C statement. No semicolon.
}
printf("There are %d elements in the array \n". count);

Solution:

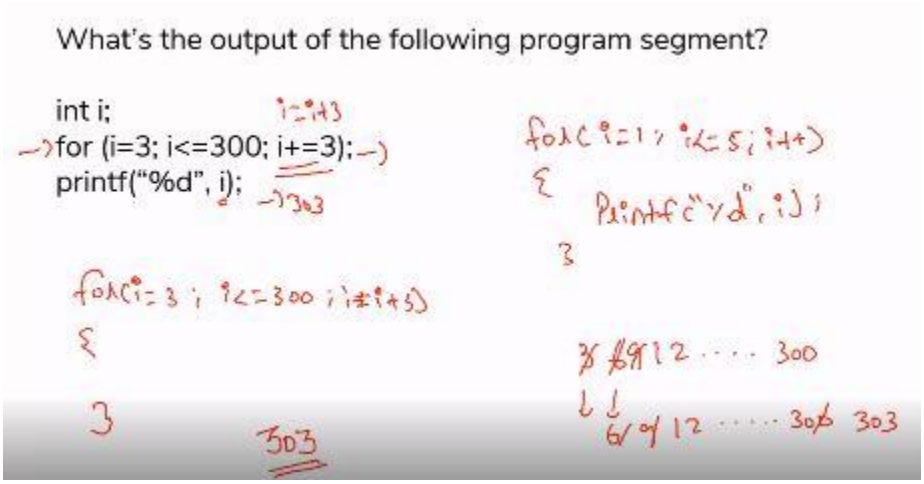
The following program is supposed to find the number of terms in the array **num_array.** What should be written in the missing last __ before the while loop's closing brace? Write your answer **without any leading, trailing, interspersed blank spaces or semicolons.**

```
int num_array[ ] = {17, 20, 23, 26, 29, 32, 35};
int count = 0;
while (count < sizeof(num_array/ num_array[0])
{
        printf("%d", num_array[count]);
        //Replace this commented line with the required C statement. No
semicolon.  count++;
}
printf("There are %d elements in the array \n", count);
```

3. What's the output of the following program segment?

```
int i;
for (i=3; i<=300; i+=3);
printf("%d", i);
```

Solution:

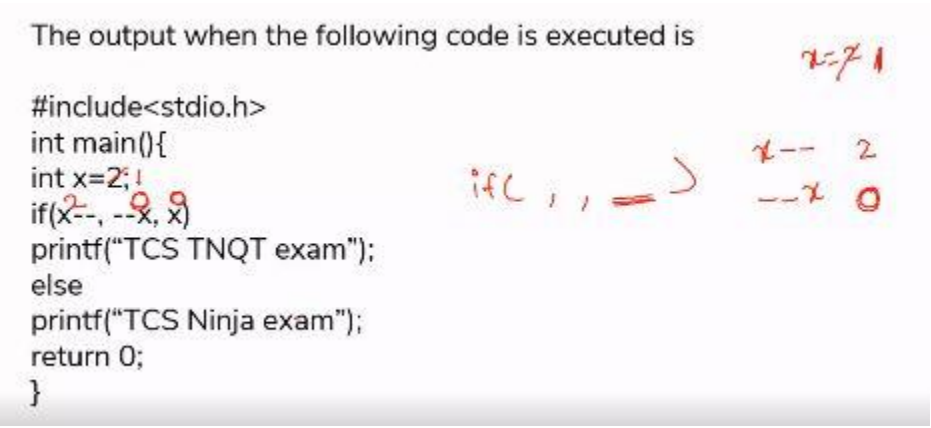


4. The output when the following code is executed is

```
#include<stdio.h>
int main(){
int x=2;
if(x--, --x, x)
printf("TCS TNQT exam");
else
printf("TCS Ninja exam");
return 0;
}
```

a. Compilation error - invalid if statement
b. TCS Ninja exam
c. Run time error
d. TCS TNQT exam

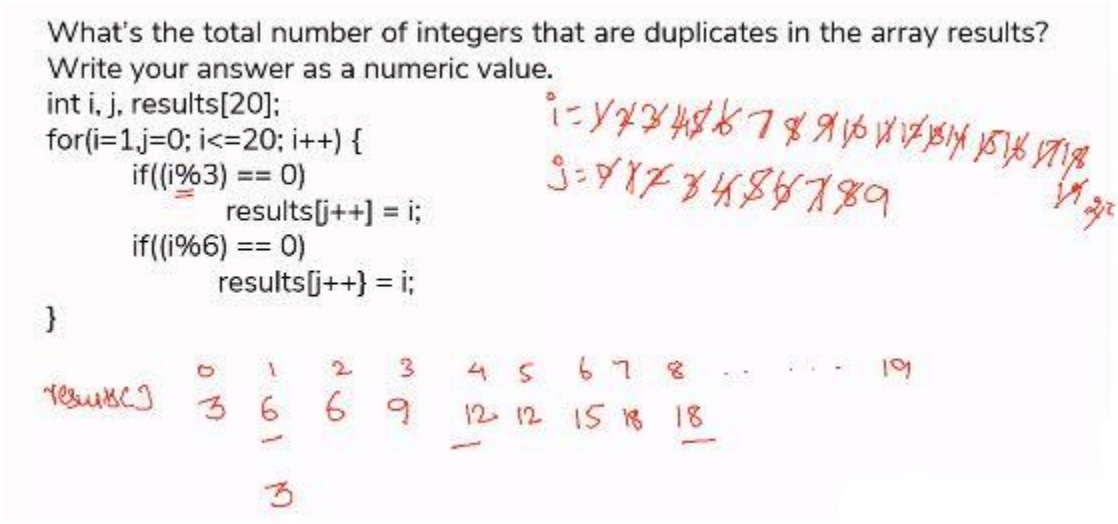
Solution: b. TCS Ninja exam



5. What's the total number of integers that are duplicates in the array results?
P.S. In the TCS NQT, this would be a FUB question you must write your answer as a numeric value.

```
int i, j, results[20];
for(i=1,j=0; i<=20; i++) {
 if((i%3) == 0)
  results[j++] = i;
 if((i%6) == 0)
 results[j++} = i;
}
```

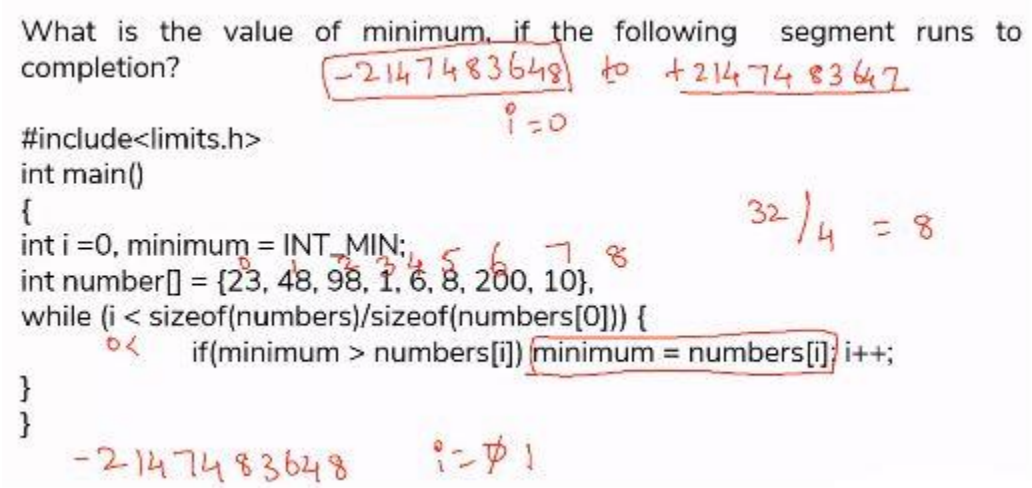
Solution:



6. What is the value of minimum, if the following segment runs to completion?

```
#include<limits.h>
int main()
{
int i =0, minimum = INT_MIN;
int number[] = {23, 48, 98, 1, 6, 8, 200, 10},
while (i < sizeof(numbers)/sizeof(numbers[0])) {
  if(minimum > numbers[i]) minimum = numbers[i]; i++;
}
}
```

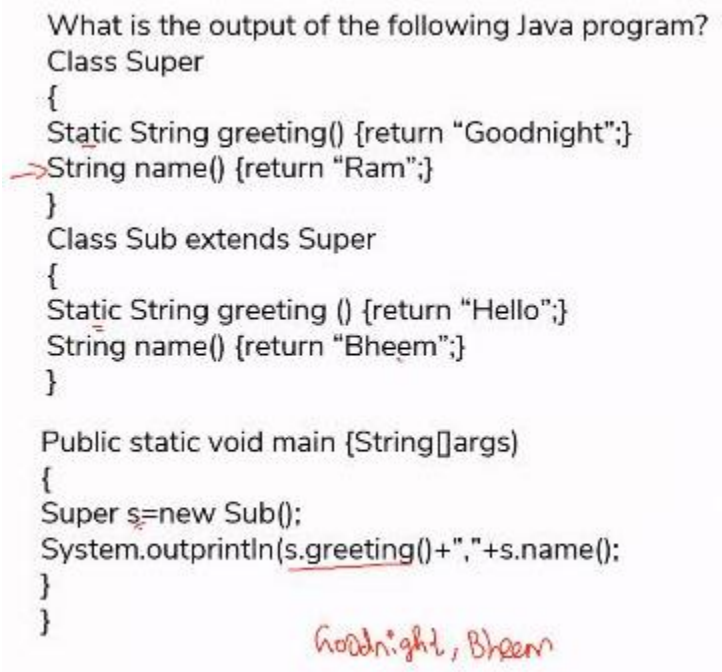
Solution:



7. What is the output of the following Java program?
   P.S. In the actual TCS NQT, this would be a FUB question.

```
Class Super
{
Static String greeting() {return “Goodnight”;}
String name() {return “Ram”;}
}
Class Sub extends Super
{
Static String greeting () {return “Hello”;}
String name() {return “Bheem”;}
}
Public static void main {String[]args)
{
Super s=new Sub();
System.outprintln(s.greeting()+”,”+s.name();
}
}
```

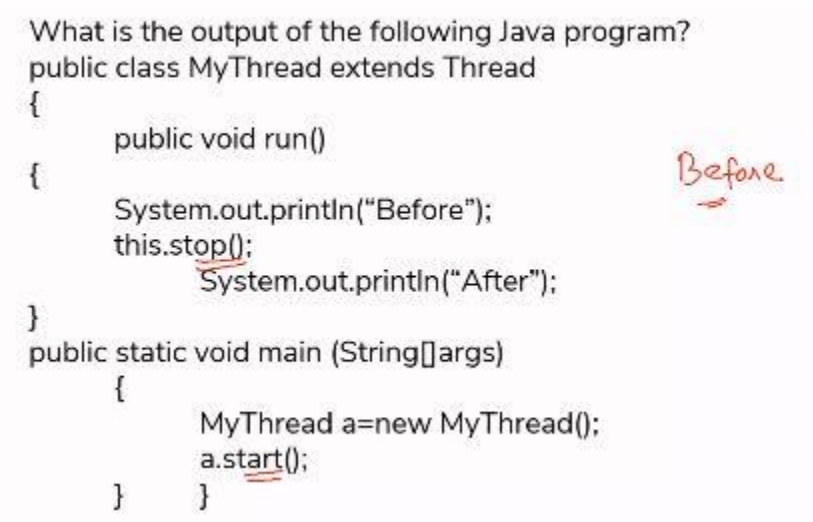
Solution:



8. What's the output of the following Java program?

```
public class MyThread extends Thread
{
  public void run()
{
  System.out.println("Before");
  this.stop();
  System.out.println("After");
}
public static void main (String[]args)
  {
  MyThread a=new MyThread();
  a.start();
  }  }
```

Solution:



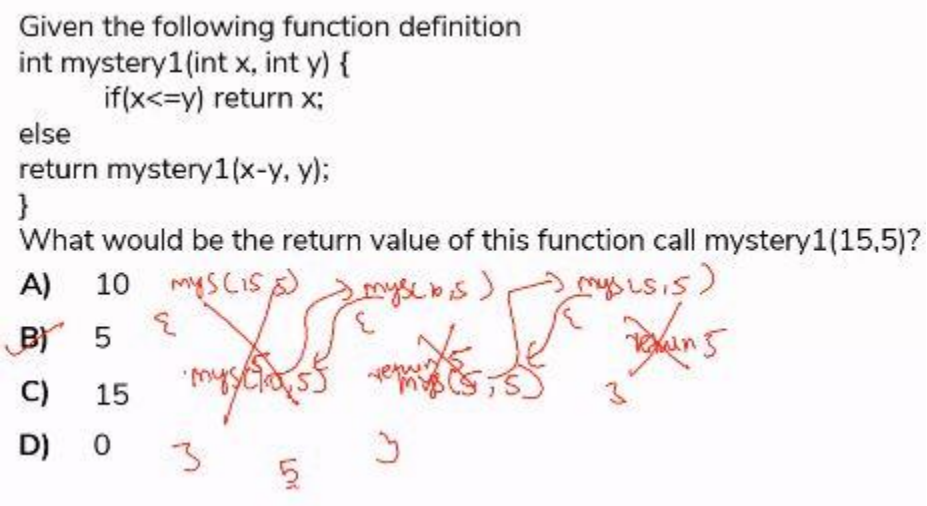
9. Given the following function definition

```
int mystery1(int x, int y) {
 if(x<=y) return x;
else
return mystery1(x-y, y);
}
```

What would be the return value of this function call mystery1(15,5)?

a. 10 b. 5 c. 15 d. 0

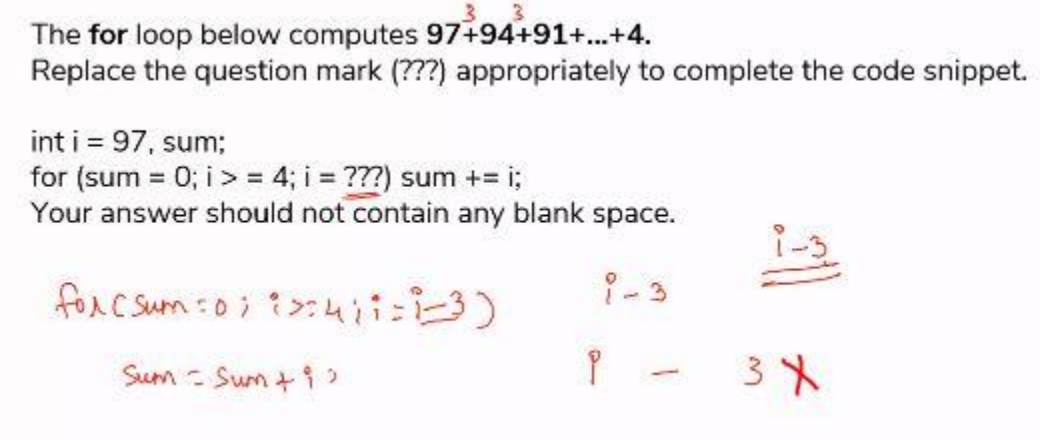
Solution: b. 5



10. The for loop below computes 97+94+91+...+4.
    Replace the question mark (???) appropriately to complete the code snippet.
    P.S. In the TCS NQT, this would be a FUB question. Your answer must not contain any blank space.

    int i = 97, sum;
    for (sum = 0; i > = 4; i = ???) sum += i;

    Solution:

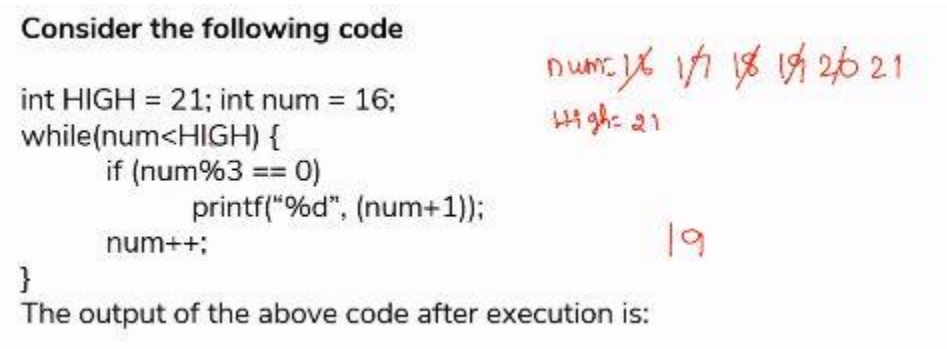


11. Consider the following code

    int HIGH = 21; int num = 16;
    while(num<HIGH) {
     if (num%3 == 0)
     printf("%d", (num+1));
     num++;
    }
    The output of the above code after execution is:

P.S. In the actual TCS NQT, this would have been a FUB question.

Solution:



12. In a class diagram, there is an arrow that starts at A and points at B. It means:
    a. A is the parent class of B
    b. B is the parent class of A
    c. A and B are loosely coupled
    d. A and B are tightly coupled

    Solution: b. B is the parent class of A
    A -------> B; wherever the arrow is pointing is the parent class.

13. The output when the code is executed is

```
#include <stdio.h>
enum food{
 buritos=3,
 Pizza=-1,
 Pasta,
 Burger };
int main(){
enum food a=0;
switch(a){
 case buritos: printf("Little Italy");
 break;
 case Pizza: printf("Pizza Hut");
 break;
  case Pasta: printf("Pasta Bar Veneto");
  break;
  case Burger: printf("Burker King");
}
return 0;
}
```

    a. Compilation error
    b. Burker King
    c. Pasta Bar Veneto
    d. Pizza Hut

Solution: c. Pasta Bar Veneto

The output when the code is executed is

```
#include <stdio.h>
enum food{
        buritos=3,
        Pizza=-1,
        Pasta,
        Burger };
int main(){
enum food a=0;
switch(a){
        case buritos: printf("Little Italy");
        break;
        case Pizza: printf("Pizza Hut");
        break;
        case Pasta: printf("Pasta Bar Veneto");
        break;
        case Burger: printf("Burker King");
}
return 0;
}
```

14. What is the equivalent while loop for the for loop given below?

```
for(int i =0, j=5; k=10; i<10; i++,j+=5)
 {
 printf(j);
}
```

a.
```
i=0;
j=5;k=10;
while(i<k)
{
 j=j+5;
i=i+1;
printf(j);
}
```

b.
```
i=0;
 j=5;k=10;
while(i<j+5)
{
 printf(j);
 j=j+5;
 i=i+1;
}
```

c.
```
i=0;
 j=5;k=10;
while(i<10)
{
 printf(j);
 j=j+5;
 i=i+1;
}
```

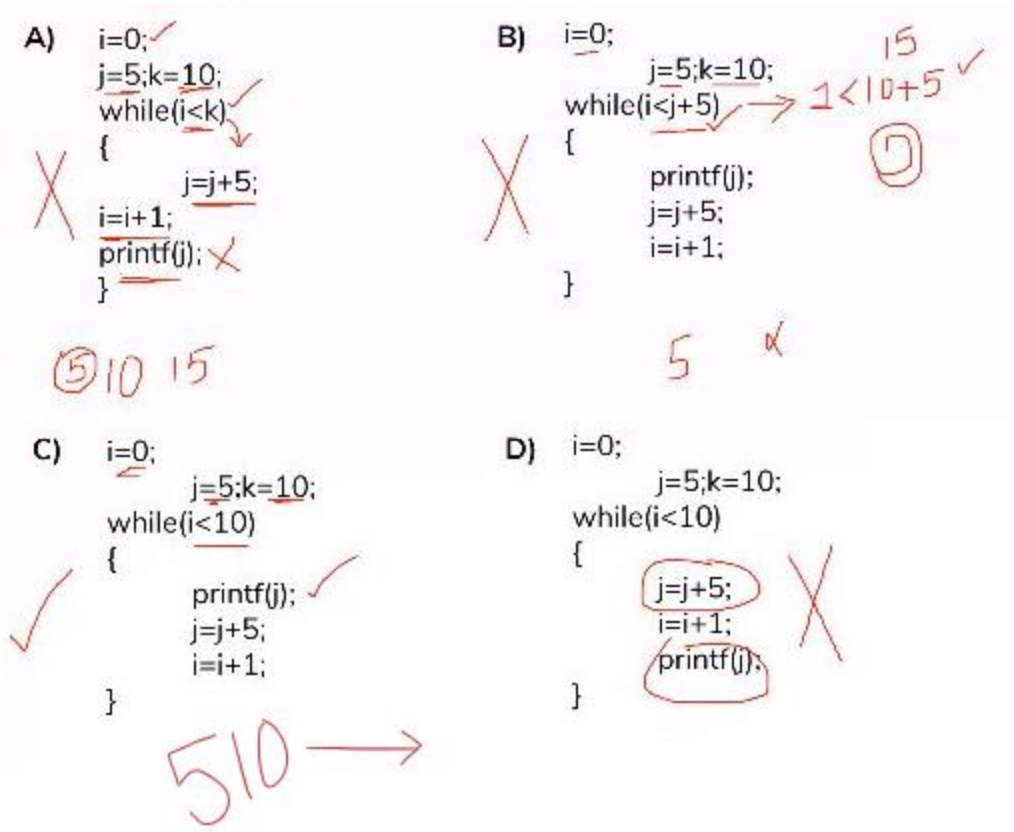
d.
```
i=0;
 j=5;k=10;
while(i<10)
{
 j=j+5;
 i=i+1;
 printf(j);
}
```

Solution:

c.
```
i=0;
 j=5;k=10;
while(i<10)
{
 printf(j);
 j=j+5;
 i=i+1;
}
```

What is the equivalent while loop for the for loop given below?

```
for(int i =0, j=5, k=10; i<10; i++,j+=5)
        {
                printf(j);
}
```

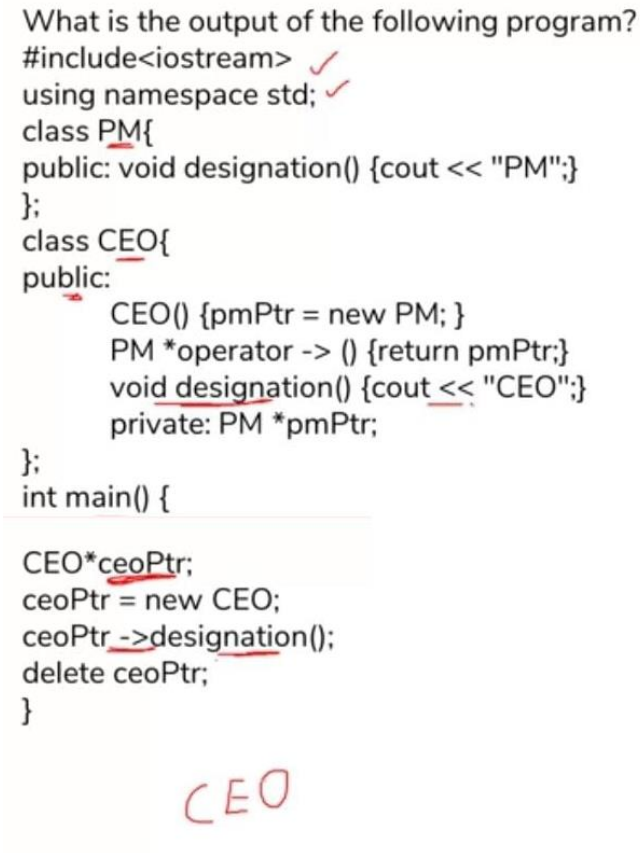


15. What is the output of the following program?

```
#include<iostream>
using namespace std;
class PM{
public: void designation() {cout << "PM";}
};
class CEO
{
public: CEO()
  {    pmPtr = new PM;   }
 PM *operator -> ()
 {    return pmPtr;   }
 void designation()
 {  cout << "CEO";}
```

```
 private: PM *pmPtr;
};
int main() {
CEO*ceoPtr;
ceoPtr = new CEO;
ceoPtr ->designation();
delete ceoPtr;
}
```

Solution:

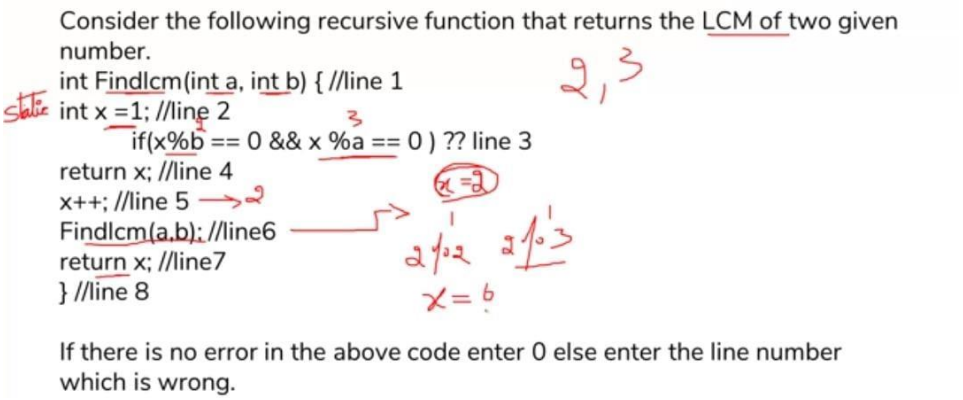


16. Consider the following recursive function that returns the LCM of two given number.

```
int Findlcm(int a, int b) { //line 1
int x =1; //line 2
 if(x%b == 0 && x %a == 0 ) ?? line 3
return x; //line 4
x++; //line 5
Findlcm(a,b); //line6
return x; //line7
} //line 8
```

P.S. In the actual TCS NQT, this would have been a FUB Question. If there is no error in the above code enter 0 else enter the line number which is wrong.

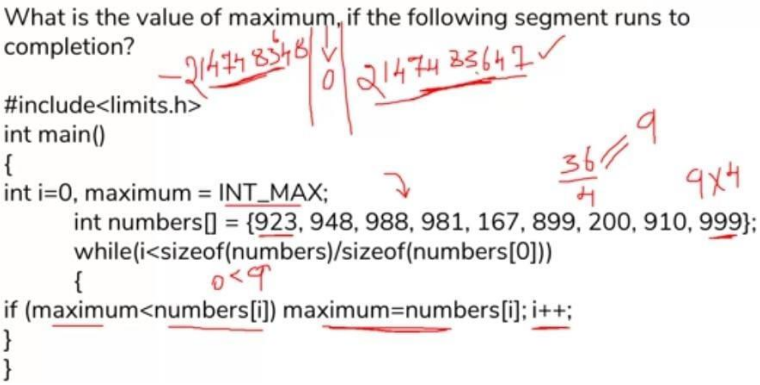
Solution:



17. What is the value of maximum, if the following segment runs to completion?

```
#include<limits.h>
int main()
{
int i=0, maximum = INT_MAX;
 Int numbers[] = {923, 948, 988, 981, 167, 899, 200, 910, 999};
 while(i<sizeof(numbers)/sizeof(numbers[0]))
 {
if (maximum<numbers[i]) maximum=numbers[i]; i++;
}
}
```

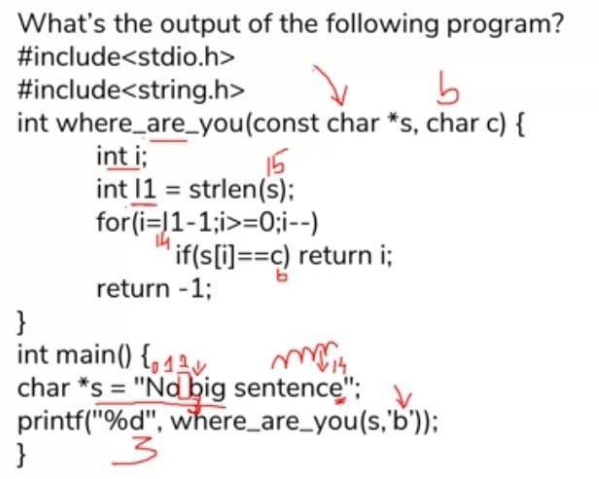
Solution:



18. What's the output of the following program?

```
#include<stdio.h>
#include<string.h>
int where_are_you(const char *s, char c) {
 int i;
 int l1 = strlen(s);
 for(i=l1-1;i>=0;i--)
 if(s[i]==c) return i;
 return -1;
}
int main() {
char *s = "No big sentence";
printf("%d", where_are_you(s,'b'));
}
```

Solution:

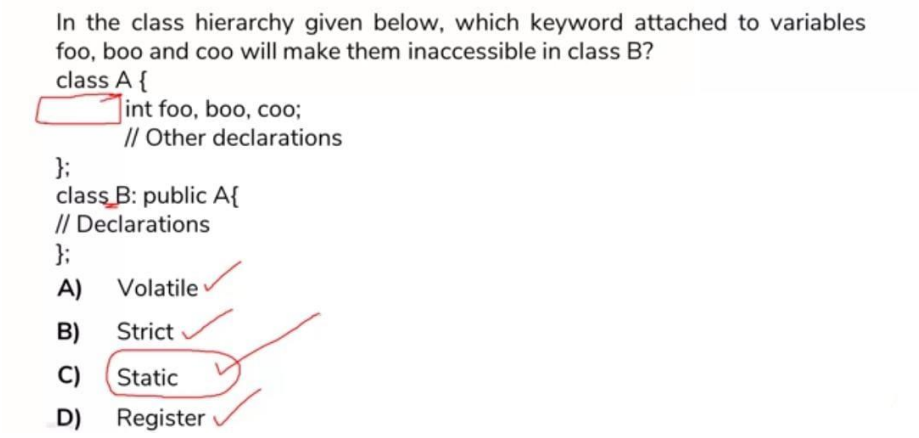


19. In the class hierarchy given below, which keyword attached to variables foo, boo and coo will make them inaccessible in class B?

```
class A {
 int foo, boo, coo;
 // Other declarations
};
class B: public A{
// Declarations
};
```

a. Volatile b. Strict c. Static d. Register

Solution: c. Static


In the class hierarchy given below, which keyword attached to variables foo, boo and coo will make them inaccessible in class B?

```
class A {
    int foo, boo, coo;
    // Other declarations
};
class B: public A{
// Declarations
};
```

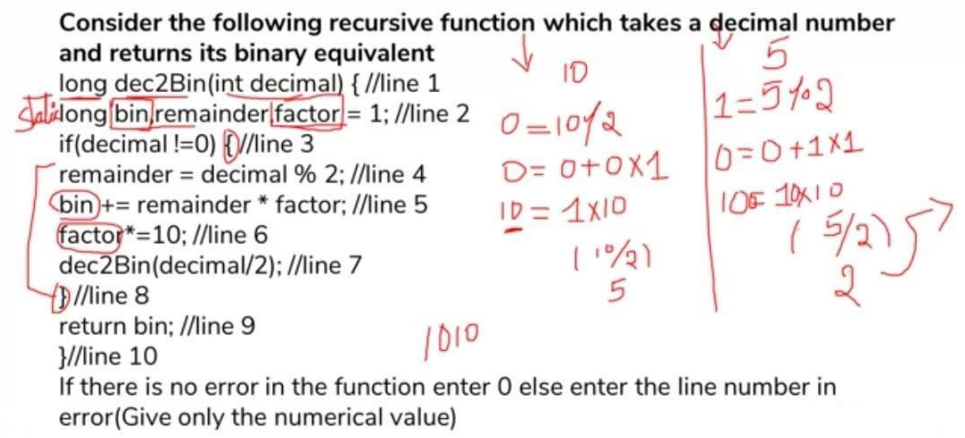
A) Volatile
B) Strict
C) Static
D) Register

20. Consider the following recursive function which takes a decimal number and returns its binary equivalent

```
long dec2Bin(int decimal) { //line 1
long bin,remainder,factor = 1; //line 2
if(decimal !=0) { //line 3
remainder = decimal % 2; //line 4
bin += remainder * factor; //line 5
factor*=10; //line 6
dec2Bin(decimal/2); //line 7
} //line 8
return bin; //line 9
}//line 10
```

P.S. In the actual TCS NQT, this would have been a FUB Question - where if there is no error in the function enter 0 else enter the line number in error (Give only the numerical value)

Solution:


Consider the following recursive function which takes a decimal number and returns its binary equivalent

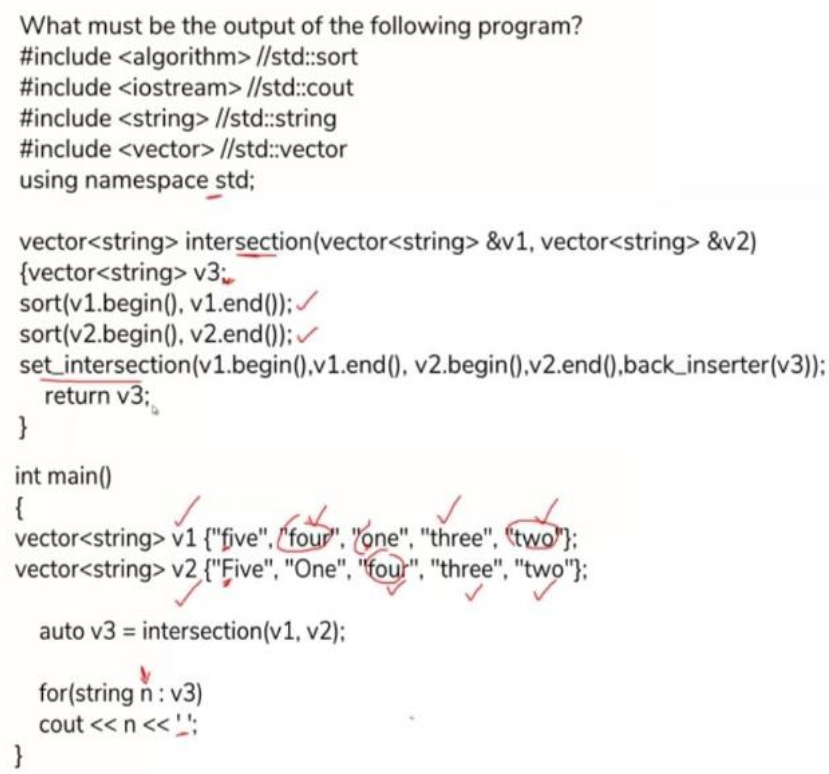
```
long dec2Bin(int decimal) { //line 1
long bin,remainder,factor = 1; //line 2
if(decimal !=0) { //line 3
remainder = decimal % 2; //line 4
bin += remainder * factor; //line 5
factor*=10; //line 6
dec2Bin(decimal/2); //line 7
} //line 8
return bin; //line 9
}//line 10
```

If there is no error in the function enter 0 else enter the line number in error(Give only the numerical value)

21. What must be the output of the following program?

```
#include <algorithm> //std::sort
#include <iostream> //std::cout
#include <string> //std::string
#include <vector> //std::vector
using namespace std;
vector<string> intersection(vector<string> &v1, vector<string> &v2)
{vector<string> v3;
sort(v1.begin(), v1.end());
sort(v2.begin(), v2.end());
set_intersection(v1.begin(),v1.end(), v2.begin(),v2.end(),back_inserter(v3));
  return v3;
}
int main()
{
vector<string> v1 {"five", "four", "one", "three", "two"};
vector<string> v2 {"Five", "One", "four", "three", "two"};
  auto v3 = intersection(v1, v2);
  for(string n : v3)
  cout << n << ' ';
}
```

Solution: Output: 4 3 2



22. Consider the following class definition

```
 class Vegetable
{
 String name;
 Vegetable(String n)
{name = n;    }
void HealthInfo()
{System.out.println("No info available");
}
}
class RootVegetable extends Vegetable
{
 RootVegetable(String name)
 {super(name);}
void HealthInfo()
{System.out.println("Root vegetables are low in calories and high in antioxidants");}
double calories()
{return 25.0;}
public String toString()
{return name+":is root"+ super.toString();}
}
class LeafVegetable extends Vegetable
{
 LeafVegetable(String name)
 {super(name);}
void HealthInfo()
{System.out.println("Leaf vegetables are low in calories and fat, and high in protein");}
double calories()
{return 78.0;}
public String toString()
{return name+":is leaf"+ super.toString(); }}
```

The output of the below code based on the above class definition is

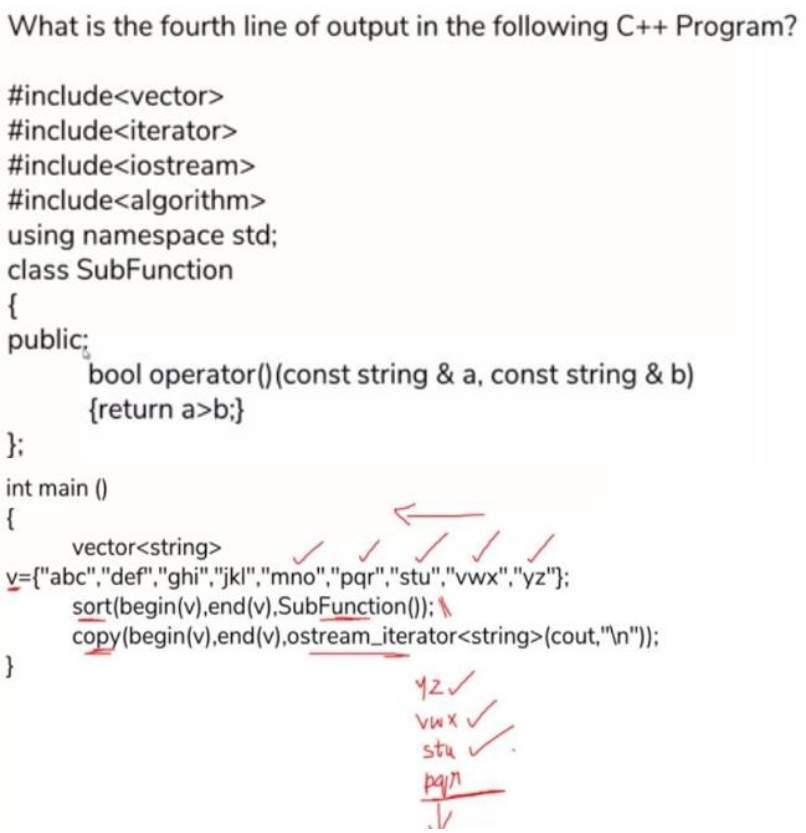
```
public class MyClass
{
public static void main(String args[])
{
Vegetable v = new Vegetable("Capsicum");
Vegetable r = new RootVegetable("Carrot");
LeafVegetable l = new LeafVegetable("Spinach");
l.HealthInfo();
}
}
```

Solution: Output: Leaf vegetables are low in calories and fat, and high in protein

23. What is the fourth line of output in the following C++ Program?

```
#include<vector>
#include<iterator>
#include<iostream>
#include<algorithm>
using namespace std;
class SubFunction
{
public:
 bool operator()(const string & a, const string & b)
 {return a>b;}
};
int main ()
{
 vector<string> v={"abc","def","ghi","jkl","mno","pqr","stu","vwx","yz"};
 sort(begin(v),end(v),SubFunction());
 copy(begin(v),end(v),ostream_iterator<string>(cout,"\n"));
}
```

Solution: Output: pqr

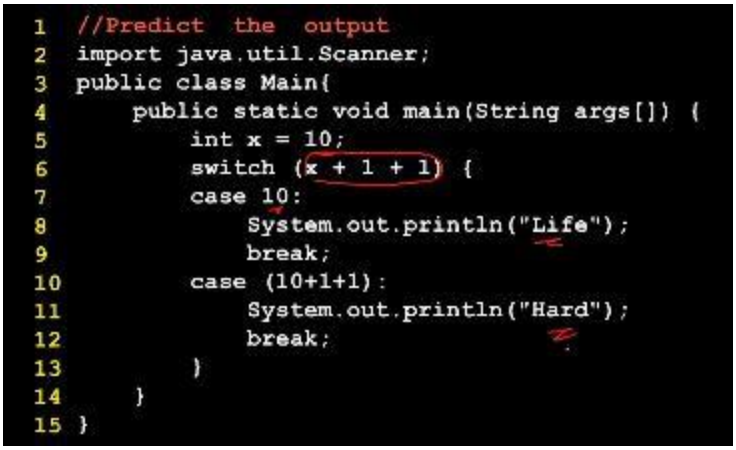


24. Predict the output.

```
import java.util.Scanner;
public class Main{
  public static void main(String args[]) {
     int x = 10;
     switch (x + 1 + 1) {
     case 10:
        System.out.println("Life");
        break;
     case (10+1+1):
        System.out.println("Hard");
        break;
     }
  }
}
```

a. Compile time error b. Hard c. Life d. No output

Solution: b. Hard

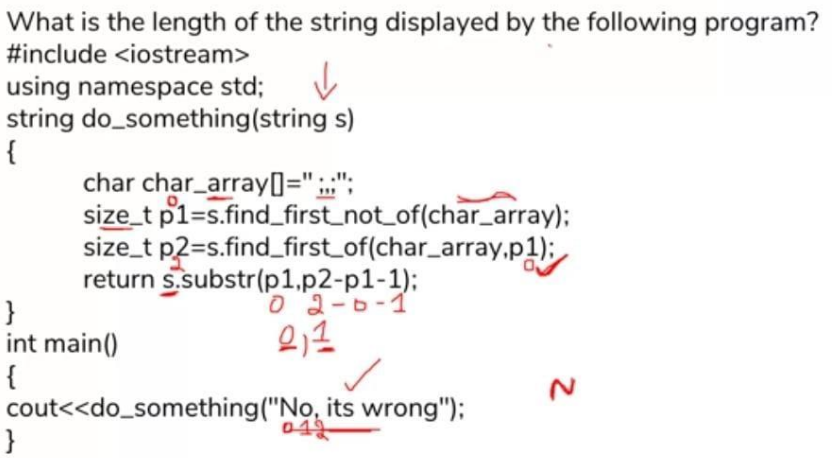


25. What is the length of the string displayed by the following program?

```
#include <iostream>
using namespace std;
string do_something(string s)
{
 char char_array[]=" ;,;";
 size_t p1=s.find_first_not_of(char_array);
 size_t p2=s.find_first_of(char_array,p1);
 return s.substr(p1,p2-p1-1);
}
```

```
int main()
{
cout<<do_something("No, its wrong");
}
```

Solution:



26. What is the output of the following code?

```
#include<stdio.h>
#include<string.h>
int how_are_you(const char *s, const char *t) {
const char *s1 = s;
while(*s) {
 if(strncmp(s,t,strlen(t))==0) return s-s1;
 s++;
}
return -1;
}
int main() {
char *s = "How many apples?";
printf("%d", how_are_you(s,"many"));
}
```

Solution:

```
#include<stdio.h>
#include<string.h>
int how_are_you(const char *s, const char *t) {
const char *s1 = s;
while(*s)     {
        if(strncmp(s,t,strlen(t))==0) return s-s1;
        s++;
}
return -1;
}
int main() {
char *s        = "How many apples?";
printf("%d", how_are_you(s,"many"));
}
```

27. Predict the output.

```
import java.util.Scanner;
public class Main {
  public static void main(String args[]) {
  int a=15;
  int b=25;
  if ((a<b) || (a=5)>15)
   System.out.println(a);
  else
   System.out.println(b);
  }
}
```

a. No output b. 15 c. 25 d. 5

Solution: b. 15

```
1  //Predict  the  output
2  import java.util.Scanner;
3  public class Main {
4      public static void main(String args[]) {
5      int a=15;
6      int b=25;
7      if ((a<b) || (a=5)>15)
8        System.out.println(a);
9      else
10       System.out.println(b);
11     }
12 }
```

28. The output when the code is executed is

```
import java.util.Scanner;
public class Main
{
   public static void main(String args[])
   {
      do
      {
        System.out.println("Hero");
      }
     while (false);
   }
}
```

a. Run time error b. Hero c. Hero print Infinite time d. Compilation error

Solution: b. Hero

```
1  //Predict  the  output
2  import java.util.Scanner;
3  public class Main
4  {
5      public static void main(String args[])
6      {
7           do
8           {
9              System.out.println("Hero");
10          }
11         while (false);
12     }
13 }
```

29. What is the output of the following code?

```
import java.util.Scanner;
public class Main
{
   public static void main(String args[])
   {
      int x = 1, y = 3;
      do
        System.out.println("World");
      while (x < y);
      System.out.println("Sky");
   }
}
```

a. World b. Wrold Sky c. World Print infinite time d. Compilation error

Solution: c. World Print infinite time

```
1  //Predict  the  output
2  import java.util.Scanner;
3  public class Main
4  {
5      public static void main(String args[])
6      {
7          int x = 1, y = 3;
8          do
9              System.out.println("World");
10         while (x < y);
11         System.out.println("Sky");
12     }
13 }
```

30. If the use-input to the following program is “a b c – 99” (without quotes), what’s the output?

```
#include <queue>
#include <string>
#include <iostream>
using namespace std;
int main()
{
 priority_queue<string> q;
 string word, end = “-99”;
 while (cin >> word) { // a b c – 99
 if (word == end) break;
 q.push(word);
}
while(q.size()) {
cout <<q.top();
q.pop();
}
}
```

Solution:

If the use-input to the following program is "a b c – 99" (without quotes), what's the output?

```
#include <queue>
#include <string>
#include <iostream>
using namespace std;
int main()
{
        priority_queue<string> q;
        string word, end = "-99";
        while (cin >> word) { // a b c – 99
        if (word == end) break;
        q.push(word);
}
```

```
while(q.size()) {
cout <<q.top();
q.pop();
}
}
```

abc-99