**CTS Interview Questions**

**Automata Fix Questions**

1) Check for syntax error/ logical error and correct the error to get the desired output.  
Given n, print from n to 0  
int main()  
{  
 int n;  
 scanf(“%d”, &n);  
 unsigned int i = n;  
 while(i >= 0)  
 {  
 printf(“%d\n”, i);  
 i–;  
 }  
 return 0;  
}

Input: 4  
Output: Infinite loop

Answer: Error – Logical error  
unsigned int i = n; unsigned integer ranges from 0 to 65535, which will be taken in the cyclic order. So i– will keep repeating in a cyclic way. The loop will never be terminated. So it should be written as int i = n;

2) Find the factorial of a given number.  
int main()  
{  
 long int fact = 1, n, i;  
 scanf(“%d”, &n);

for(i =1; i <= n; i++)  
 {  
 fact = fact \* i;  
 }  
 printf(“%d”, fact);  
 return 0;  
}

Input: 20  
Output: -2102132736

Answer: Error – Logical error  
The fact and n are declared as long int, so in scanf and printf %ld should be used in place of %d.

3) Check whether the below program print the below pattern  
1111  
222  
33

void main()  
{  
 int i, j, n;  
 scanf(“%d”, &n);  
 for(i = 1; i<n; i++)  
 {  
 for(j = 1; j<n; j++)  
 {  
 printf(“%d”, i);  
 }  
 printf(“\n”);  
 }  
}

Input: 3  
Output:  
111  
222  
333

Answer: Error: Logical error  
The inner for loop has to be written in this way: for(j = i-1; j<n; j++)

4) Find the greatest of three numbers.  
int main()  
{  
 int num1, num2, num3;  
 scanf(“%d %d %d”, &num1,&num2,&num3);  
 if (num1 > num2) && (num1 > num3)  
 {  
 printf(“%d”, num1);  
 }  
 elseif(num2>num3)  
 {  
 printf(“%d”, num2)  
 }  
 else  
 {  
 printf(“%d”, num3);  
 }  
 return 0;  
}

Answer: Error: Syntax error  
if (num1 > num2) && (num1 > num3) à it has to be written as if ((num1 > num2) && (num1 > num3)) and this line elseif(num2>num3) should be rewritten as else if(num2>num3)

5) Fix the error, recompile and match against the output provided.  
int main(void)  
{  
 printf(“This is a \”buggy” program\n”);  
 return 0;  
}

Corrected program:  
int main(void)  
{  
 printf(“This is a \”buggy\” program\n”);  
 return 0;  
}

6) Code reuse: Convert Binary to Decimal by using the existing function.  
void binarytodecimal(number)  
{  
 // Type your code here  
}  
void main()  
{  
 int num;  
 scanf(“%d”, &num);  
 printf(“%d”, binarytodecimal(num);  
}

Answer:  
void binarytodecimal(number)  
{  
 int dval=0, base=1, rem;  
 while(number > 0)  
 {  
 rem = number % 10;  
 dval = dval + rem \* base;  
 num = number / 10;  
 base = base \* 2;  
 }  
 return dval;  
}

7) Print the prime numbers from an array up to given value n by using existing function.  
int isprime(int num)  
{  
 // type your code here  
}  
int main()  
{  
 int n, m, arr[100], size=0, i;  
 scanf(“%d”, &n);  
 for(m = 2; m <= n; m++)  
 {  
 if(isprime(m))  
 {  
 arr[size++]= m;  
 }  
 }  
 for(i = 0; i < size; i++)  
 {  
 printf(“%d\n”, arr[i]);  
 }  
 return 0;  
}

Answer:  
int isprime(int num)  
{  
 int i;  
 int isprime = 1;  
 for(i = 2; i <= num / 2; i++)  
 {  
 if(num % i == 0)  
 {  
 isprime = 0;  
 break;  
 }  
 }  
 return isprime;  
}

Cognizant Interview questions set 1

1) What are different types of modifiers in C?  
There are 5 modifiers available in C language. They are: short, long, signed, unsigned, and long long

2) What is a static variable?  
A static local variable retains its value between the function call and the default value is 0. The  
following function will print 1 2 3 if called thrice.

3) a++ or a = a+1, which can be recommended to increment the value by 1 and why?  
a++, as it is single machine instruction (INC) internally.

4) What is a dangling pointer?  
A pointer initially holding a valid address, but later the held address is released or freed. Then  
such a pointer is called as a dangling pointer.

5) What are lvalue and rvalue?  
The expression appearing on the right side of the assignment operator is called as rvalue. Rvalue is  
assigned to an lvalue, which appears on the left side of the assignment operator. The lvalue should  
designate to a variable not a constant.

6) Explain the use of %i format specifier w.r.t scanf().  
Can be used to input integer in all the supported format.

7) When to use -> (arrow) operator.  
If the structure/union variable is a pointer variable, to access structure/union elements the  
arrow operator is used.

8) Which built-in library function can be used to re-size the allocated dynamic memory?  
realloc().

9) What is typecasting?  
Typecasting is a way to convert a variable/constant from one type to another type.

10) What is meant by Compilation?  
The process of translating source code written in high level to low-level machine code is called  
as Compilation. The compilation is done by special software known as a compiler. The compiler  
checks source code for any syntactical or structural errors and generates object code with  
extension .obj (in Windows) or .o (in Linux) if source code is error free.

### Cognizant Interview questions set 2

11) What are the stages in C compilation?  
[Preprocessing, Compilation, Assembling and Linking.](https://www.faceprep.in/procoder/knowledgebase/compiling-a-c-program/)

12) What do you mean by pre-processing a source file?  
The C compilation begins with pre-processing of a source file. Pre-processor is a small software  
that accepts C source file and performs below tasks.  
– Remove comments from the source code.  
– Macro expansion.  
– Expansion of included header files.  
After pre-processing, it generates a temporary file with .i extension. Since it inserts the contents of  
header files to our source code file. Pre-processor generated file is larger than the original  
source file.

13) Difference between the header file and library file.  
In simple terms, the library contains function body whereas header file contains function prototype.

14) What is the difference between far and near pointers?  
In the first place, they are non-standard keywords. A near pointer can access only 2^15 memory  
space and the far pointer can access 2^32 memory space. Both the keywords are implementation  
specific and are non-standard.

15) What is a ternary operator and define its syntax?  
Ternary operator is the same as if else control statement in C.  
Syntax : (Condition? true\_value: false\_value);  
Example: (A &gt; 100? 0: 1);

16) Difference between memcpy() and strcpy() functions in C.  
memcpy() function is used to copy a specified number of bytes from one memory to another.  
Whereas, strcpy() function is used to copy the contents of one string into another string.  
memcpy() function acts on memory rather than value. Whereas, strcpy() function acts on value  
rather than memory.

17) What is const pointer in C?  
Const pointer is a pointer that can’t change the address of the variable that is pointing to. Once  
const pointer is made to point one variable, we can’t change this pointer to point to any other  
variable. This pointer is called const pointer.

18) List out some of C compilers.  
• clang  
• Cygwin  
• Digital mars  
• GCC compiler  
• MikroC Compiler

19) What is the difference between variable declaration and variable definition in C?

* Variable declaration tells the compiler about data type and size of the variable. Whereas, variable definition allocates memory to the variable
* Variable can be declared many times in a program. But, definition can happen only one time for a variable in a program.
* Variable declaration is for assignment of properties and identification to a variable. Whereas, a variable definition is for assignments of storage space to a variable

20) What is enum in C?

* Enumeration is a data type that consists of named integer constants as a list.
* It starts with 0 (zero) by default and value is incremented by 1 for the sequential identifiers in the list.

21) What will i and j equal after the code below is executed?   
When these operators precede a variable, the value of the variable is modified first and then the modified value is used. For example, if we modified the above code snippet to instead say int j = ++i;,i would be incremented to 6 and then j would be set to that modified value, so both would end up being equal to 6.

22) Is there a difference between class and struct?  
The only difference between a class and struct are the access modifiers. Struct members are  
public by default; class members are private. It is good practice to use classes when you need an  
object that has methods and structs when you have a simple data object.

23) Explain the volatile and mutable keywords.  
The volatile keyword informs the compiler that a variable may change without the compiler knowing it. Variables that are declared as volatile will not be cached by the compiler, and will thus always be read from memory. The mutable keyword can be used for class member variables. Mutable variables are allowed to change from within const member functions of the class.

24) How many times will this loop execute? Explain your answer.  
unsigned char half\_limit = 150;  
for (unsigned char i = 0; i &lt; 2 \* half\_limit; ++i)  
{  
 // do something;  
}  
Code will result in an infinite loop.  
The expression 2 \* half\_limit will get promoted to an int (based on C++ conversion rules) and will have a value of 300. However, since i is an unsigned char, it is represented by an 8-bit value which, after reaching 255, will overflow (so it will go back to 0) and the loop will, therefore, go on forever.

25) What is a main() and difference b/w void main() and int main()?  
Main() is an entry point ( main function) which is in most programming languages, When compiler begins compile the program, It looks for an entry point, and main() acts as an entry point in C program, or we can say main is a thread/ process/ function that invokes automatically by the compiler when program is being executed.