Steps to solve a problem:

1. Understand the problem properly.
2. Pay attention to the given values.
3. Try to find an approach.
4. Create a program based on the approach.
5. Prepare a flow chart first or a pseudocode.
6. Then write the high-level source code.
7. And as the high-level code is not understandable by the computer, we need to convert it into a machine understandable code.

Components of a flow chart:

1. - Terminator – Where a program starts and end.
2. - Input/Output.
3. - Some processing is taking place.
4. - Decision Making or Applying Condition.
5. – Represent flow of program.
6. - Connector.

Pseudocode – A generic way of representing your look/logic/flow. Very similar to English language.

Type Casting – The process of converting data type of a variable after it’s declaration.

Unsigned Keyword – Using it before the declaration of variable then we can only store positive values inside that variable.

IDE – Integrated Development Environment which is a place where you can write, edit and run code.

Int main() – Depicts the executable part of the program in C++.

#include – It is an command to load a file which includes the all the definitions of different commands which are also called header files.

1’s Complement – Convert all 0s to 1s and 1s to 0s.

2’s Complement – After taking 1’s complement add 1 to it.

If a number is negative then the first binary bit will be 1 and if it’s positive it’ll be 0.

Padding while shifting any positive number to left/right is always done with zero but in case of the negative number it is always compiler dependent.

The number is multiplied by 2 in shifting it to the left the number of times it is asked to shift.

The number is divided by 2 in the shifting it to the right the number of times it is asked to shift.

The variable which is declared inside a particular block can only be used in that block only and not outside it which is called the scope of the variable.

Edge cases are the exceptional cases which we come across after running the code which may result in the wrong output of the code.

We have to make use of a mask to solve the question of complement of any number.

To reduce the buggy and bulkiness or to increase the readability of the code we use functions so that we can reuse the same piece of code multiple times.

Void keyword is used while initializing a function to let the compiler know that this particular function will not return any kind of value.

Passing any variable by value means creating a n copy of the same value into another variable which can also have the same name of the previous one. And even if we change the value of the new variable whose value was passed by value then it will not affect the value of the old variable.

Arrays are the type of data structure which stores similar type of values in it under a single variable name in a contagious(continuous) manner which can also be accessed using indexes.

Dry running code means to get a better understanding of the code using pen and paper without using the computer.

To find any unique element in any array we use the XOR(^) concept.

Big O = Worst Case Complexity = Highest Time Taken By An Algorithm To Run.

Theta = Average Case Complexity = Average Time Taken By An Algorithm To Run.

Omega = Best Case Complexity = Lowest Time Taken By An Algorithm To Run.

To calculate complexity of a given function we need to ignore all the constants and focus on finding the greatest variable which gives us the greatest value when applied on a constant.

The concept of binary search is only applied on monotonic functions/values i.e., the data should be always arranged either in ascending order or in descending order.

Std :: setprecision(n) is used to cout any float number up to ‘n’ decimals which is included in ‘iomanip’ header file.

The range in which our answer lies is called the search space of that particular question.

STL refers to Standard Template Library.

Vectors are similar to arrays but the only difference is that it doubles its size when it gets full by creating another vector of double the size of the previous one and then copies all the values from the old vector which got full to the new vector and then destroys the old vector.

Deque is a data structure which inserts/deletes elements from both the ends.

Default priority queue is always based on the concept of max heap.

Set is the type of data structure which stores unique elements in it and even if we try to enter same elements in it, then also the elements stored in the set will be unique.

The sort() function is based on the concept of intro sort which is made by the combination of quick sort, heap sort and insertion sort.

Null character is represented in the memory location as “/0”.

The cin command stops its execution when it encounters any space, tab and new line character so to get the complete string entered by the user we use the cin.getline() function.

Symbol table is a data structure maintained by the compiler to stores the data of the variables with respect to their names mapped to an address.

The concept of pointer is used to store the address of any variable.

Double pointer is the pointer of the pointer which is pointing to an address of a particular value.

The best example of reference variable is by imagining the same student having 2 different names of which one is used in school and other is used in his home and this same concept is used while passing any variable’s value by reference and not by value itself in any function.

The size of array should be known at the compile time and not at the runtime because the stack and the heap memory are decided at the compile time and if you made an array of big memory than the stack memory allocated then the program may crash.

New keyword is used to tell the compiler that we want to use the heap memory which is greater than the stack memory which is used in dynamic memory allocation but you can not allocate names to the new variables you want to create in heap memory and you can only use addresses.

The memory once taken by the stack is released after the successful execution of that block but in case of heap you have to do it manually using delete keyword otherwise the code might crash.

Macro is a piece of code in a program that is replaced by the value of that macro.

Global variables can be declared if we want any variable to be accessible in every segment of code and it is defined outside any block of code.

The benefits of using inline functions are that there will be no memory wastage and no function call like it used to do in normal functions.

Default arguments in functions refers to the arguments which we want to be optional and even if the user doesn’t enter any value to that argument, it will still run without throwing any errors using the default value of that argument but if we want to define any of these, we must always start from the right most part of the arguments.

The concept of recursion basically has two main components of which one is the base case which tells us where to stop the recursive function and the other named recursive relation which is a relation of how a function can call itself inside its body.

The case in which the recursive relation comes above processing part of the recursive function is called the head recursion and the case in which the processing parts comes above the recursive relation is called the tail recursion.

An object is basically an entity which contains a state/properties and behaviour.

A class is nothing but a user defined data type.

An object is an instance of a class.

In case of an empty class only 1 byte of memory is allocated to the object of that class.

To include a class from a different file we can use “#include ‘’ClassName.cpp””.

(\*b) can also be written as b->.

The constructor is called whenever we try to create an object.

There are two types of calling a constructor, one is done by doing it statically [className objectName] and the other is done by doing it dynamically [className \*objectName = new className].

“this” keyword stores the address of the current object.

We can also copy the old constructor’s value by typing “className newObjectName (oldObjectName);“.

Destructors are used to deallocate the memory occupied by the constructor and is declare by using the ~ tilda sign.

Destructors are automatically called for statically allocated memory but we need to call them manually for dynamically allocated memory.

For dynamically allocated memory the destructor is called by writing “delete objectName;” inside the main function.

Static function can only access static member variables and not any other variables initialized inside the specific class.

Declaring static variable for a particular class outside it - Int className :: variableName = variableValue;.

Encapsulation refers to the phenomenon when we mark all the data members/properties as private and it is called a fully encapsulated class.

Encapsulation is referred to as hiding the data of a class from the other classes.

Private properties/data members of any class can not bee accessed by any other class using any kind of inheritance.

Inheritance refers to the phenomenon of copying all the public data from a class to another class and there are many types of inheritance.

Scope operator :: is used when the name of functions in all the classes is same but after inheritance we need to call the function of a particular class.

Polymorphism is the most important as it is asked in the interviews of a lot of companies.

Poly means many and morph means forms which together sums up as polymorphism which means multiple forms.

There are two types of polymorphism of which one is compile time polymorphism which includes function overloading and operator overloading and the other is run time polymorphism which consists of method overriding.

To overload a function with the same name we need to use different arguments for all of them for the system to differ between them.

By overloading an operator, we can change the task it performs by using void operator(operator) ();

Compile time polymorphism is also known as static polymorphism whereas run time polymorphism is also known as dynamic polymorphism.

Run time polymorphism use method/function overriding which means that we can change how a function of a class reacts when called even after inheriting it form any other class.

Abstraction refers to the implementation hiding which means that we hide all useless information from the user which he/she does not need to know like for an example while sending an email we only see the message sent we receive after successfully sending any email but we don’t care how is the data transmitted behind the screen.

Linked list is a linear data structure formed by a collection of nodes which contains its own data and the address of the next node.

Linked list is a dynamic data structure which can either grow or shrink on runtime.

Insertion and deletion are easy.