

Assignment - 11

Q1] What are the characteristics of C++ programming language?

Ans

- 1] It is a native programming language.
- 2] It is high level programming language.
- 3] It is object oriented programming language.
- 4] It is procedural as well as object oriented approach.
- 5] It is a block structured language.
- 6] It supports static data typing concept.
(variable \rightarrow $\text{int} \text{ or } \text{float}$)

Q2] Explain Object Oriented Paradigms.

Ans Object orientated Programming has four paradigms :

1] Encapsulation : Binding characteristics & behaviour together is called as encapsulation.

To achieve encapsulation we create class.

2] Abstraction : Abstraction is hiding something from outside world. To achieve abstraction we use the access specifier like private.

3] Inheritance : Inheritance in simple terms is considered as reusability of characteristics & behavior.

4] Polymorphism : Single name & multiple behaviours is considered as polymorphism.

Q 3] Explain the concept of constructor & its types

Ans

- .) Constructor is a special function in C++ & Java.
- .) Constructor is a function which gets automatically called when we create object of a class.
- .) The compiler will call the constructor before allocating the memory for object.

B) There are 3 types of constructors in C++

- 1] Default constructor
- 2] Parameterized constructor
- 3] Copy Constructor

— To create constructor we need to follow some rules

- 1] Name of constructor should be same as class name
- 2] All the constructors & destructors should be inside public access specifier.
- 3] There should not be return value from the constructor & destructor.
- 4] There is no need of explicit call to the constructor & destruction.
- 5] If we create an object without passing any parameter, then the default constructor gets called
- 6] If we create an object by passing parameters, the parameterized constructor gets called
- 7] If we create an object by passing another object then the copy constructor gets called

- ∴] Constructor is used to initialize the characteristics as well as it is used to allocate the resources.
-) Constructor is not used to allocate memory for object.

(Q4) What is meant by Access Specifier?

Ans

- The concept of access specifier is used to specify which part of a class can be accessed by the outsiders & which part cannot be accessed.
- If we want to allow -
- There are 3 different access specifiers in C++
[1] Public , 2] Private , 3] Protected . - In Java
- If we want to allow everyone access without any restrictions , then it should be written under the public access specifier.
- If we want to hide something from the outside world then we use the private access specifier
- The data which is written under private access specifier is only accessible inside the class in which it is written.
- By using this concept we achieve the object object oriented paradigm i.e. abstraction
- If the class wants to provide the access to its child class (derived class) , then the data should be written under protected access specifier.
- In Java there is one more specifier added called default.

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Q5] What are the contents of a class?

- Ans - Object Orientation is one of the most important building block of C++ programming.
- To achieve the concept of object orientation, C++ provides the new data type as class.
 - Class is considered as an user-defined data type which is almost similar as the structure from C-programming.
 - Class is an user-defined data type which contains two things in it :
- 1) Characteristics (data members)
 - 2) Behaviours (functions)

Characteristics are data members of class which contain values

Behaviours are functions of class which contain the functionality.

Q6] What is the use of constructor & destructor?

Ans .

- 1) Constructor is used to initialize the characteristics as well as it is used to allocate the resources.
- 2) Destructor is used to deallocate the resources which was allocated inside the constructor.

Q7] Write a program to find maximum of

two numbers using procedural approach (C) & object oriented approach (C++)

Ans] C - approach

```
#include <stdio.h>

int findMax(int no1, int no2)
{
    if (no1 > no2)
        return no1;
    else
        return no1;    no2;
}

int main()
{
    int iValue1 = 0, iValue2 = 0;
    int iAns = 0;

    printf("Enter the 1st number\n");
    scanf("%d", &iValue1);
    printf("Enter the 2nd number\n");
    scanf("%d", &iValue2);

    iAns = find findMax(iValue1, iValue2);

    printf("The maximum of two numbers is %d", iAns);

    return 0;
}
```

2] C++ - approach

```
#include <iostream>
```

```
using namespace std;
```

```
class maxoftwo
```

```
{
```

```
public:
```

```
    int inum1, inum2;
```

```
    maxoftwo(int ino1, int ino2)
```

```
{
```

```
        inum1 = ino1;
```

```
        inum2 = ino2;
```

```
}
```

```
    int maxiumum()
```

```
{
```

```
        if (inum1 > inum2)
```

```
{
```

```
            return inum1;
```

```
}
```

```
        else
```

```
{
```

```
            return inum2;
```

```
}
```

```
}
```

```
int main()
```

```
{
```

```
    int ifirst = 0, isecond = 0;
```

```

cout << "Enter the 1st number " << endl;
cin >> ifirst;
cout << "Enter the 2nd number " << endl;
cin >>isecond;
maxoftwo obj1(ifirst,isecond);
int maxnumber = obj1.maximum();
cout << "The maximum of two is " << maxnumber << endl;
return 0;
}

```

Q8] What are the data types in C++?

Ans

- Inside every application we need some memory to store values
- To store the values we have to create the variable.
- Before creating a variable we have to decide its data type
- the data types in C++ are divided into 3 parts
 - i] Primitive
 - ii] Derived
 - iii] User-defined

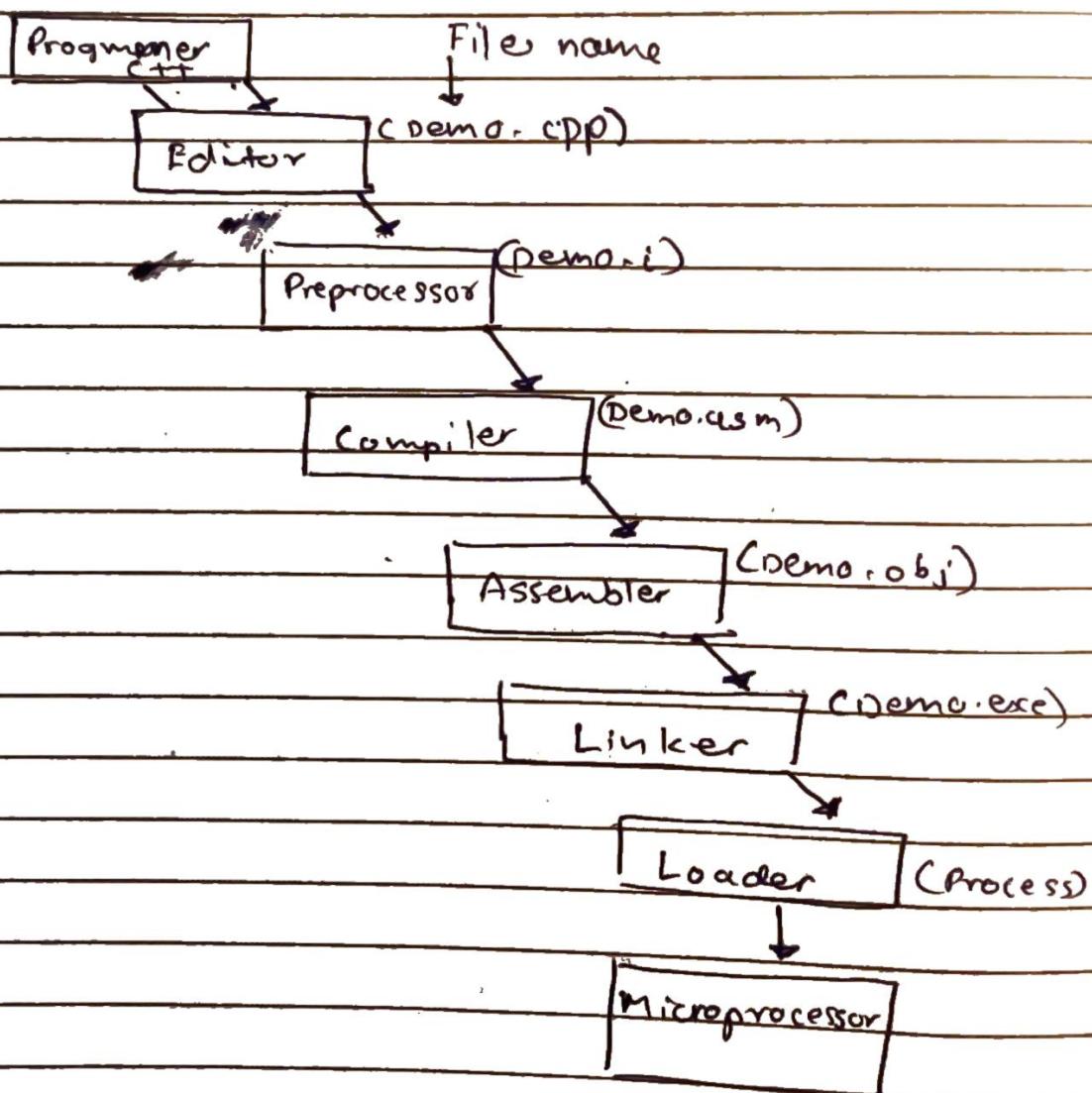
1. Data types in C++

Primitive	Derived	User-defined
- char		
- void	- Array	- Structure
- int	- Pointer	- Union
- float	- Function	- Enumeration
- double	- Reference	- Class
- bool		

i) The data types provided by language designer are called as primitive data types

Q9] Explain the toolchain of C++ program.

Ans the major task of toolchain is to convert the program from human understandable format into machine understandable format



Step 1: Programmer uses editor to write file program. After the writing is completed the file is saved inside Hard Disk with name Demo.cpp.

The contents of Demo.cpp are human readable & human understandable.

Step 2 : Preprocessor accepts the input in '.cpp' file format & it generates the file which is expanded version of '.cpp' file.

The file created by preprocessor is Demo.i
'i' stands for intermediate code.

Step 3 : The contents of 'i' are human understandable & human readable.

Step 3 : The output of preprocessor gets provided as input to compiler.

Compiler is a Software which converts the program from one language to other language.

In our case the compiler converts the program from human understandable into machine dependent format i.e.

Assembly Language

The file created by compiler is having extension ',asm' or ',s'.

Step 4 : The output of compiler is passed as a input to the assembler. A Assembler is a software which is used to convert the program from machine dependent format into machine understandable format.

The output of assembler is the file with extension '.obj'.

'.obj' file contains the code in Binary format but it is not directly executable.

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Step 5: Linker is responsible to link the '.obj' file generated by assembler & its dependent .obj file.

Linker generates output file with extension '.exe'

In our case Demo.exe is the output of linker.

Step 6: The '.exe' file generated by the linker is currently stored ~~inside~~ inside the Hard Disk

-) To execute any application it has to be loaded inside RAM.
-) The Loader is responsible to load the '.exe' file from Hard Disk into RAM.
-) After Loading the '.exe' file it gets considered as process & is executed with help of operating system.

Q(10) what is the use of Abstraction?

- Ans) Abstraction is hiding something from outside world.
-) To achieve the abstraction we use the access specifier like 'private',