UNIT III

EMBEDDED FIRMWARE DEVELOPMENT ENVIRONMENT

3.5 Embedded Programming in C++

• C++is an object oriented Program(OOP) language, which in addition, supports the procedure oriented codes of C.

• Program coding in C++ codes provides the advantage of objected oriented programming as well as the advantage of C and in-line assembly.

C++

_ *struct* that binds all the member functions together in C. But a C++ *class* has object features. It can be extended and child classes can be derived from it. A number of child classes can be derived from a common class. This feature is called polymorphism.

A class can be declared as public or private. The data and methods access is restricted when a class is declared private . *Struct* does not have these features.

_A class binds all the member functions together for creating objects. The objects will have memory allocation as well as default assignments to its variables that are not declared *static*.

_A class can derive (inherit) from another class also. Creating a *child* class from RTCSWT as a *parent* class creates a new application of the RTCSWT.

_Methods (Cfunctions)canhavesamenameintheinheritedclass.Thisiscalled*methodoverloading*

_Methods can have the same name as well as the same number and type of arguments in
The inherited class.This is called *method over riding*. These are the two significant features that are extremely useful in a large program.

_Operators in C++ can be overloaded like in method overloading.

_ For example, operators++and! Are overloaded to perform a set of operations.

Some disadvantages

- Lengthier Code when using Template , Multiple Inheritance (Deriving a class from many parents),Exceptional handling, Virtual base classes and classes for IO Streams.

Ways to overcome the disadvantages

1) Declare private as many classes as possible.It helps in optimizing the generated codes.
2) Use *char*, *int* and *Boolean* (scalar data types) in place of the objects (reference data types) as arguments and use local variables as much as feasible.
3) Recover memory already used once by changing the reference to an object to NULL.
4) A ***special compiler for an embedded system*** can facilitate the disabling of specific features provided in C++. **Embedded C++** is a version of C++ that provides for a selective disabling of the above features
5) Use Embedded C++: It provides for less run time overhead and less run time library. The solutions for the library functions are available and ported in C directly.
6) The IO stream library functions in an embedded C++ compiler are also re entrant.
7) Using embedded C++ compilers or the special compilers make the C++ more powerful coding language than C for embedded systems due to the OOP features of software re-usability, extendibility, polymorphism, function over riding and over loading along portability of C codes and in – line assembly codes.