

IEEE Embedded Systems Task

Beginner level

1- What is the difference between call by value and call by reference?

Call by value: actual parameters (passed to a function) will be copied to formal parameters (received by a function) and the two store values in different locations.

To conclude calling by value is passing the values to the variables but not the variables itself.

Call by reference: both actual & formal parameters points to the same memory location.

(we pass addresses instead of values)

2- What is type casting and what are its types? Explain the difference between the types.

Type casting: the process of converting a data type into another type using casting operator.

Types: implicit & explicit.

a- Implicit: the compiler will automatically change one type of data into another if it makes sense. (performed automatically without the programmer intervention).

b- Explicit: done by the programmer using cast operator as follows: (type_name)expression.

3- What is the difference between struct and union in C?

Structure(struct): is used to create and store a package of data related to each other that describes a thing. It is a collection of variables that can be of different types under a single name.

Union: used to store different data types into the same memory location. We can define many members as per the requirement but we need to remember that stored value is shared by all members. The union provides an efficient way of using the same memory location but carefully.

4- Does shift right always add zeros to the left? explain your answer.

No, it depends on whether the type is signed or unsigned as in the signed int the sign bit is preserved.

5- Explain the difference between dangling and wild pointers.

- Wild pointers are uninitialized pointers and their behavior is undefined because they point to some arbitrary memory location, and they may cause the program to crash or behave badly.
- Dangling pointers: they arise when the referencing object is deleted or deallocated without changing the value of the pointer and when we try to access it the program crashes.

Bonus question:

The statement below is given about the extern storage specifier in C: "An extern storage specifier is used to define a new variable in the scope of a file." Is this statement true or false? Explain your answer.

False, it is used when we have global functions or variables which are shared between two or more files.