

# Option 20 - PCB

**Simple class: Contact** - contains information about the contact type (input or output), coordinates (X, Y) of the location on the board, coordinates of the associated contact. (output), coordinates (X, Y) of the location on the board, coordinates of the associated contact (output or input). (output or input). These descriptors define the traces. A contact can have zero or one connection. An input contact can be linked only to an output contact, and an output contact can be linked only to an input contact.

**Methods of a simple class (besides the common ones):**

- creating an instance of the class with initialization by type and coordinates;
- creation of an instance of the class as a linked instance for a given contact (coordinates are passed, but the type must be defined based on the given contact);
- (>>) creating a link between two contacts;
- (<=>)1  
comparing two contacts by their location;
- calculation of the signal transmission delay between the two contacts depending on the distance between them (set the transmission rate as a constant).

**Complex class: Printed circuit board - defined by a vector of contacts. Two different contacts cannot be located on the same coordinate.**

**Methods of the complex class (besides the general ones):**

- creating instances of the class with initialization with a given number of contacts from an array of contacts;**
- creation of class instances with initialization by one contact;**
- (+=) adding a new contact to the board;**
- ([]) getting a contact by its number (return by reference);**
- adding a link between two contacts specified by their numbers;**
- deleting a link for a given contact (and for a linked contact);**
- deleting a contact with a specified number (if there is a link, it should be deleted);**
- ordering of contacts in the vector by their coordinates;**
- changing the location of a contact specified by its number;**
- searching for the most distant pair of related contacts.**

1. If the compiler/language standard you are using does not yet support the "<=>" operator, implement instead the

2 operators: "==" and "<".

