C++ Programming

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C++ Programming

- What is programming?
- What is all about programming languages?
- How to select a programming language?
- How much one should know exactly?
- C++
- Examples

Programming

- **Set of instructions to execute some action**

  eg. tea making, adding 2 numbers, eat food

- **Types of Programming**

  - self programming

    eg. childhood learning from surrounding

  - user induced programming

    eg. computer-software programming

Programming Languages

Catagory: user induced programming

- **Lots of programming languages exist**
  - ADA, ALGOL, BASIC, C, DELPHI, FORTRAN, PASCAL, COBOL, FOXPRO, C++, C#
  - Visual Basic, Visual Foxpro, Visual C++, java, ...

- **Lots of scripting languages also exist!**
  perl, python, javascript, ActiveX, etc.

contd.. (programming languages)

- **Major Differences:**

    -Need of Compiler

    - g77/f77, qbasic, pascal, gcc, g++/c++, etc.

    -Need of IDE (Integrated Development Env)

    -inbuilt compile/link methods (usually buttons)

    -Scripting environment support

    -runtime environment, eg. perl/javascript/python

    PHP, ActiveX needs client (IE/Mozilla) to run

Select a Programming Lang.

- **Problem specific**

    - what is the Algorithm (logic used)

    - how easy/difficult to implement that

    - hardware dependencies

- **Ease of Use**

    - FORTRAN for scientific purposes

    - COBOL for Business related

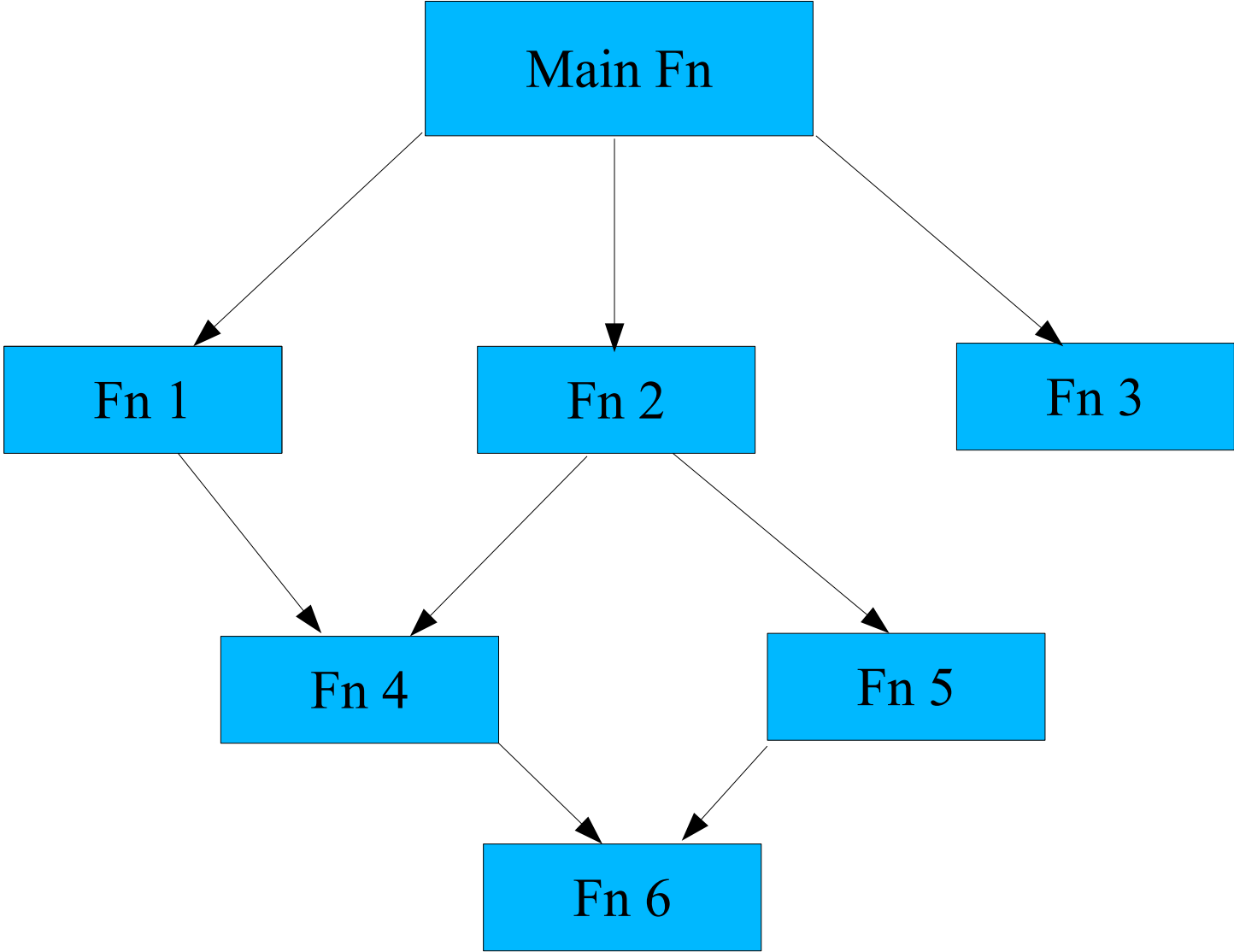   - C for hardware related

C++ Programming

- **Procedure oriented Programming**

  conventional programming as COBOL, FORTARN & C

  problem is viewed as a sequence of things to be done: reading, calculating, printing

 **no. of functions are written to do all this**

  Primary focus is on functions

Characteristics of procedure programming

- emphasis on function algorithms
- large programs are divided into smaller
- most of the functions share global data
- data move openly around the system (fn 2 fn)
- functions transform data from one to another
- employs top-down approach in program design
- does not model real world problems well

Object oriented programming

- Data is treated as a critical element in program development

- Data is tied closely to the functions

    protects it from accidental modification

- OOP allows to decompose a problem into a number of entities called Objects

Object A

DATA

functions

Object B

DATA

functions

Object C
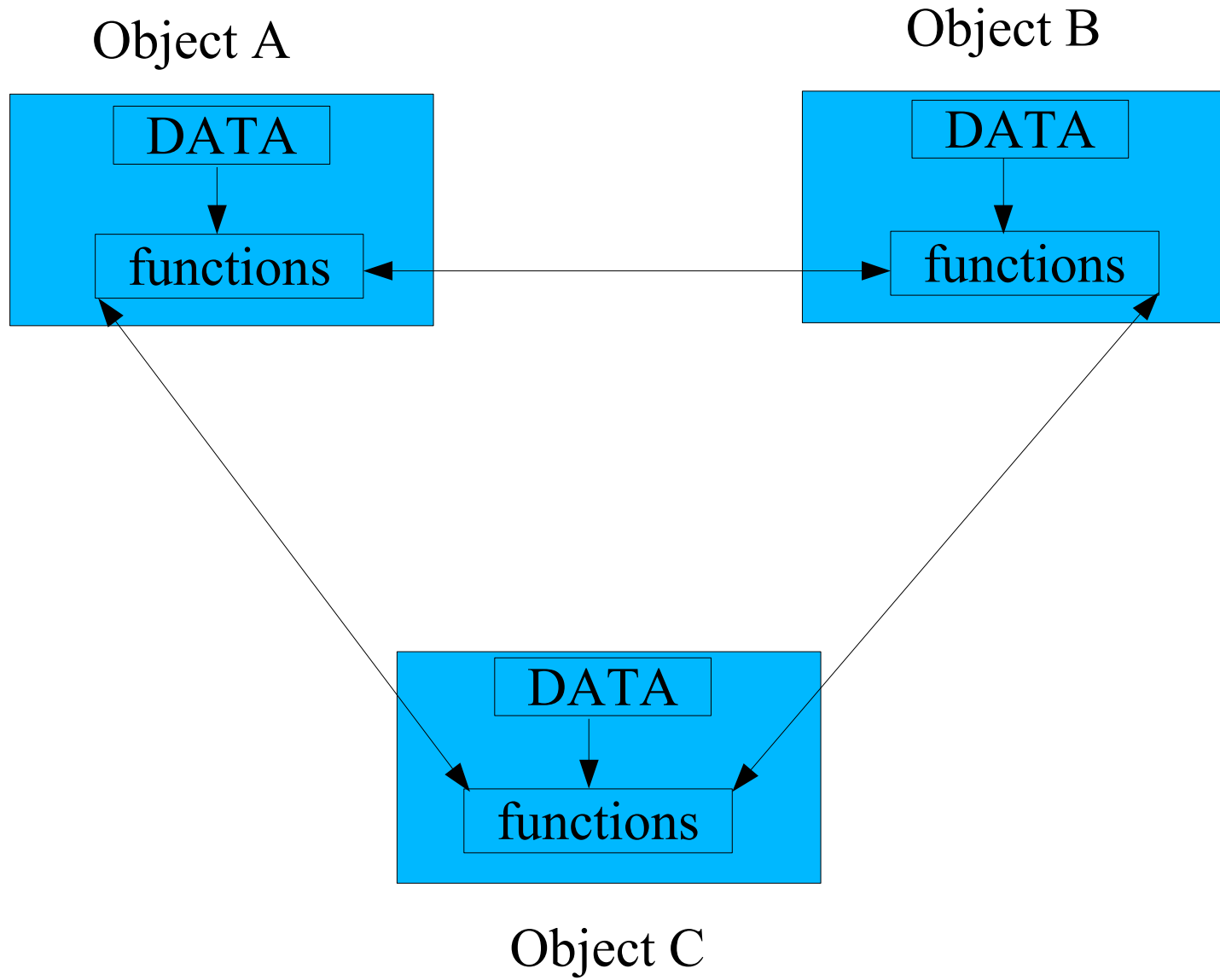
DATA

functions

Features of OOP

- Data emphasis is more than functions

- Objects are the main entities of the programs

- Functions accessing data of an object are tied in the data structure

- Design of the Data Structure tells the characteristics of the objects

- Data hiding from external functions implemented

- Objects communicate with each other via functions

- As & when needed new data & functions are added

- Program design approach is bottom-up

Basic Concepts of C++

- Objects
- Classes
- Data abstraction
- Data encapsulation

- Inheritance
- Polymorphism
- Dynamic binding
- Message passing