Tutorial 2

* 1. Function in C: Computations will be conducted inside the function, we can simply call it in the main function easily, and reusable, easily maintainable.
  2. Higher level programming languages:
     1. Easier syntaxes to read, simple, tasks will run under the hood. Easier to debug. Portable, can run on any platform
     2. Cons: Requires interpreter, slower, less memory efficient

2a) Which of the following statement(s) is / are TRUE?

1. ~~Only a very extensive ISA can support very complicated user program.~~
2. By building on top of C, we can implement more advanced programming languages.
3. ISA is an example of abstraction too.
4. ~~Using an abstraction requires the user to understand all the underlying details.~~

2b) Which of the following questions regarding ISA is / are TRUE?

1. ~~An ISA can only be implemented by one processor chip.~~
2. Compiler need to know the ISA of a processor in order to do compilation
3. Programmer of a high level programming language need to know the ISA in order to code.
4. ~~The same program written in high level programming language can be compiled for different ISAs.~~

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| --- | --- | --- | --- | --- | --- |
| **Current Setup** | **New Setup** | **Y / N** | **Software** | **Instruction Set Architecture** | **Hardware** |
| Your “Hello World” C++ program compiled  on your **Windows** laptop. The executable is  “Hello.exe”. | The “Hello.exe” executable is copied to the  lab **Windows** machine to run. | Y | Same  (OS / executable) | Same (x86) | Same |
| Your “Hello World” C++ program compiled  on your **Windows** laptop. The executable is  “Hello.exe”. | The “Hello.exe” executable is copied to your  mobile phone (iOS or Android) to run. | N | Different | Different  (x86 vs ARM) | Different |
| Your C++ source code e.g. “HelloWorld.cpp”  can compile and run on the lab machine. | The “HelloWorld.cpp” source code is copied  to a **macOS** laptop. g++ is  used to compile the source code. | Y | Different OS but with the correct compiler | Same (x86) | Same |
| Your “Hello World” C++ program compiled  on your **macOS** laptop. | The “Hello” executable is copied to the lab  **Windows** machine to run. | N | Compiled program on Mac is unix executable | Same (x86) | Same |
| A Java program is compiled on your  **macOS** laptop, producing an executable  Hello.class. | The Java executable Hello.class is copied  to the lab **Windows** machine to run. | Y | Same executable extensions | Same (x86) | Same |
| A **Python** program Hello.py is written and  executed on your **macOS** laptop. | The same Python program Hello.py is  copied to the lab **Windows** machine to run. | Y | Same file extension with the correct compiler | Same (x86) | Same |