Lecture 6 - Worksheet (1)

Question 1

Most languages have an intermediate form before they are finally translated to machine code. Guess one or two reasons why it is not common just to translate to the machine?

Question 2

BNF, or Backus-Naur Form is a way to express valid syntactic sentences in a language. BNF is very commonly use when we want to express the grammar for a language or a part of a language. Consider the following BNF for a language of very restricted arithmetic expressions:

<expr> ::= <num> + <expr1> | <num>
<expr1> ::= <num> * <expr>
<num> ::= <digit> | <digit> <num>
<digit> ::= 0 | 1

The lecturer will briefly explain what the above means. Now answer the following: which of the following expressions are valid?

a. 3+0

b. 10+11

c. 11+110*1+10

d. 111+01*001

Lecture 6 - Worksheet (2)

Question 3:

Sketch out a CPU (consider its interface). What should go into the CPU and what should go out (take a guess… see how many wires you can get correct from what you already know!)

Question 4

CISC stands for Complex Instruction Set Computing – this is a CPU design where one instruction can perform a complex operation such as loading in an operand, from memory, applying an operator and storing the result. RISC (Reduced Instruction Set Computing) has much smaller operations – usually requiring separate loading, operation and storing. From the hardware point of view what would be one advantage of a RISC architecture?