Quiz-1 Soln

Question-1  UNC is developing a new operating system TOS and wants to provide a 32-bit and 64-bit versions of TOS to the customers. Unfortunately due to budget cuts their build machines are all 32-bit machines and a single 64-bit machine that is used for testing. So, they entrusted the CS department with the problem of generating the 64-bit TOS by just using 32-bit machines and software.

You can assume that they have a 32-bit compiler for x86 called tcc and skilled compiler programmers.

- What is the process of generating 64-bit binaries using a 32-bit machine called?  [1 pt]  
  Cross-Compilation

- Write down or draw all the steps to solve the problem for UNC, remember to use → notation as in the slides[4 pt].

  ![Cross Compiler](image)

  (a) Soln 1b

  ![Cross Compiler](image)

  (b) Soln 1c

- UNC via grants acquired more 64-bit machines and wants to now generate 64-bit binaries using the 64-bit machines. They want to do this without having to write a new compiler from scratch to run on the 64-bit machine. How would you solve the problem and what is the resulting compiler called?  Hint: You should need to add just one more step to your previous answer.  [2 pt]

  Self-Hosting Compiler
**Question-2**  How did Pascal users develop a new compilers for different platforms? You don’t need to write all the details simply the steps using $\rightarrow$ notation. [3pt]

![Diagram showing the process of compiling Pascal code to machine code]

- **Pascal Compiler**: Any program $\rightarrow$ P-Code
- **P-Code**: Compiled code $\rightarrow$ PC
- **PC**: Program code $\rightarrow$ PC_P-Code
- **P-Code->machine code**: Machine code is generated

*Pascal Interpreter build one for each target*