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# 淡江大學八十八學年度碩士班招生考試試題

系別：資訊管理學系

科目：計算機概論

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1. (14%)
  - (a) What's the definition of an algorithm?
  - (b) Do the following instructions describe an algorithm? explain your answer.
    - Step 1: Build a list of all even positive integers.
    - Step 2: remove the smallest integer from the list
    - Step 3: if the list is not empty, return to step 2.
  
2. Convert each of the following decimal representations to its equivalent two's complement form using patterns of two bytes. Expression your answer in hexadecimal notation. (12%)
  - (a) 765
  - (b) -8088
  - (c) 40000
  
3. What is a linker? What's is an loader? Make your answer as detailed as possible. (12%)
  
4. Compare CISC and RISC architectures. (12%)
  
5. Design an algorithm to find the square root of a positive number by starting with the number itself as the first guess and repeatedly producing a new guess from the previous one by averaging the previous guess with the result of dividing the original number by the previous guess. (15%)
  - (a) use pseudo-code to describe your algorithm.
  - (b) derive the flow chart of (a).
  - (c) what's the proper the termination condition of such an algorithm?
  
6. (20%)
  - (a) Write a program based on recursive structure to find the greatest common divisor of two positive integers by using the Euclidean algorithm. Use any programming language you familiar with.
  - (b) Take 96 and 60 as a test example to demonstrate the correctness of your program.
  
7. Base on the object-oriented developing environment, describe the concepts of encapsulation, polymorphism and generic programming. (15%)