CZ1106 Problem Solving and Computation II

Tutorial 1

25 Jan 2006, 6pm
Venue: Temasek Hall

Students will present questions 4 to 7. Please prepare the solutions.

1. (a) A program called kickyou.c is to be executed from a command line. Tabulate the contents of argv[0], argv[1], ..., if relevant, for each of the following command-line instructions.

   i. kickyou \target=leg \strength = strong
   ii. kickyou againand again

   (b) Also, fill in the following table for the above command-line instructions.

	argc	argv[1]	*argv[2]	*(argv[3]+1)	*(argv[4]+2)
i.					
ii.					

2. Write a program called cap.c that takes from the command line several strings and displays them in capital letters on the screen, one on each line. For example, if you type

   cap I eAT an apPLe

   The screen output will be

   I
   EAT
   AN
   APPLE

   Your program should work for any number of strings.

3. Write a program to accept an unsigned integer from the keyboard and use bit operators to determine if the number of 0-bits in the unsigned integer is even or odd.

4. (i) Evaluate $-99_{(10)} + (-111)_{10}$ by calculator.

   (ii) Using 8-bit 2's complement arithmetic, evaluate the above sum again. Show your working in 2's complement, and explain the result.

5. Use the 5-bit two's complement to compute

   $$\mathbf{11_{(10)} + 14_{(10)}}$$

   and explain the correctness of your result.

6. Suppose you are working on a 2's complement computer that does not provide bitwise complementation (~). Assume that + and – operators are available. How do you implement the ~ operator on this platform ?

7. Write down the values of the following sequence in decimal numbers.

   $2^0, 2^1, 2^2, 2^3, 2^4, 2^5, 2^6, 2^7, 2^8$

   Repeat the exercise until you can complete it within 10 seconds.