

S&T2024 Advanced C Tutorial 1

21 May 2025 Wednesday 2pm, PGPR

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

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

and explain the correctness of your result.

6. Suppose you are working on a 2's complement computer that does not provide bitwise complementation (\sim). Assume that $+$ and $-$ operators are available. How do you implement the \sim 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.