Quiz 1

Q1. a

$$\log_2^2 n = \log_2 n \times \log_2 n$$

$$\log_2 n^2 = 2\log_2 n$$

$\therefore \log_2 n^2$ has a higher order of growth

Q1. b

$$n! = n \times (n-1) \times \dots \times 1$$

$$(n-2)! = (n-2) \times \dots \times 1$$

$$n! = n \times (n-1) \times (n-2)!$$

$\therefore (n-2)!$ has a lower order of growth

Q2.

1) input size n

basic operation : addition/substraction in the while loop

2)

$$n + (n-1) + (n-2) + \cdots (n-n)$$

$$= n \times n - (1+2+3+\cdots+n)$$

$$= n^2 - \frac{n(1+n)}{2} = \frac{n^2-n}{2} \in O(n^2)$$