Additional explanations for Week 1 exercise:

Problem 6. For A+2 peak to be the most abundant, the following conditions must hold:

(1) A+2 > A

(2) A+2 > A+1

For condition (1), the inequality is:

$$\frac{n(n-1)}{2} \cdot \alpha^{(n-2)} \cdot (1-\alpha)^2 > \alpha^n$$

$$n^2 - n - \frac{2\alpha^2}{(1-\alpha)^2} > 0$$

substitute $\alpha = 0.9889$ and solve,

$$n_{min} = 127$$

For condition (2), the inequality is:

$$\frac{n(n-1)}{2} \cdot \alpha^{n-2} \cdot (1-\alpha)^2 > n \cdot \alpha^{n-1} \cdot (1-\alpha)$$

Solving, $n_{min} = 180$

We take the larger n_{min} value $\Rightarrow$ $n_{min} = 180$.

Problem 7. The condition A+2 > A is considered because it automatically satisfies A+2 > A+1 due to isotope abundances of sulfur.

^{32}S	95.0%
^{33}S	0.76%
^{34}S	4.22%

Abundance of ^{34}S is much greater than that of ^{33}S, hence by statistics A+2 > A+1 if A+2 > A.

Thus only A+2 > A is considered.