Programming assignment

1. Write a Python program to list the integer solutions for

(a) $x_1 + x_2 + x_3 = 10$, where $0 \leq x_i$ for $1 \leq i \leq 3$;

(b) $x_1 + x_2 + x_3 + x_4 = 4$, where $-2 \leq x_i$ for $1 \leq i \leq 4$.

2. In Theorem 2.20 of the lectures, it is shown that the Stirling numbers of the second kind satisfy the recursion

$$S(m + 1, n) = S(m, n - 1) + nS(m, n)$$

for $1 < n \leq m$ with the initial conditions $S(m, 1) = 1$, $S(m, m) = 1$, for $m \geq 1$.

(a) Write a Python program that calculates $\frac{1}{m+n}S(m, n)$, based on this recursion, for (reasonably large) positive integers m, n.

(b) Use the program to calculate $\frac{1}{17}S(12, 5)$ and $\frac{1}{21}S(13, 8)$.

Your clearly listed outputs should also be included in your submission.

Your submission should be uploaded on the course Canvas site by November the 17th at the latest.