Latex exercises on writing algorithms

1 Exercise 1

Write Algorithm 1! Test how to refer to it in the text (like here).

**Alg. 1 PartitioningClustering**\((S, n, k)\)

**Input:** Data set \(S\), \(n = |S|\), number of clusters \(k\)

**Output:** Centroids \(c_1, ..., c_k\)

begin

2 Select randomly \(k\) data points \(p_1, ..., p_k \in S\)
3 \textbf{for} all \(p_i\)  \hspace{1cm}  // Initialization
4 \hspace{0.5cm} begin
5 \hspace{1cm} \(c_i = p_i\)
6 \hspace{1cm} \(C_i = \{p_i\}\)
7 \hspace{0.5cm} end
8 \textbf{while} (not converged)  \hspace{1cm}  // Update clusters
9 \hspace{0.5cm} begin
10 \hspace{1cm} \textbf{for} all \(p_i \in S\)
11 \hspace{1.5cm} begin
12 \hspace{2.5cm} Search \(c_j\) such that \(d(p_i, c_j)\) is minimal
13 \hspace{2.5cm} \(C_j = C_j \cup \{p_i\}\)
14 \hspace{2.5cm} end
15 \hspace{1cm} Update centroids \(c_i\)
16 \hspace{0.5cm} end
17 end

2 Exercise 2

Test how to write the following kind of method using an itemize list!
Step 1 $x = x + 1$
Step 2 $y = x^2 + 1$
Step 3 If $y \leq n$ return to Step 1.

2.1 Exercise 3

Write an algorithm or a method to your paper!