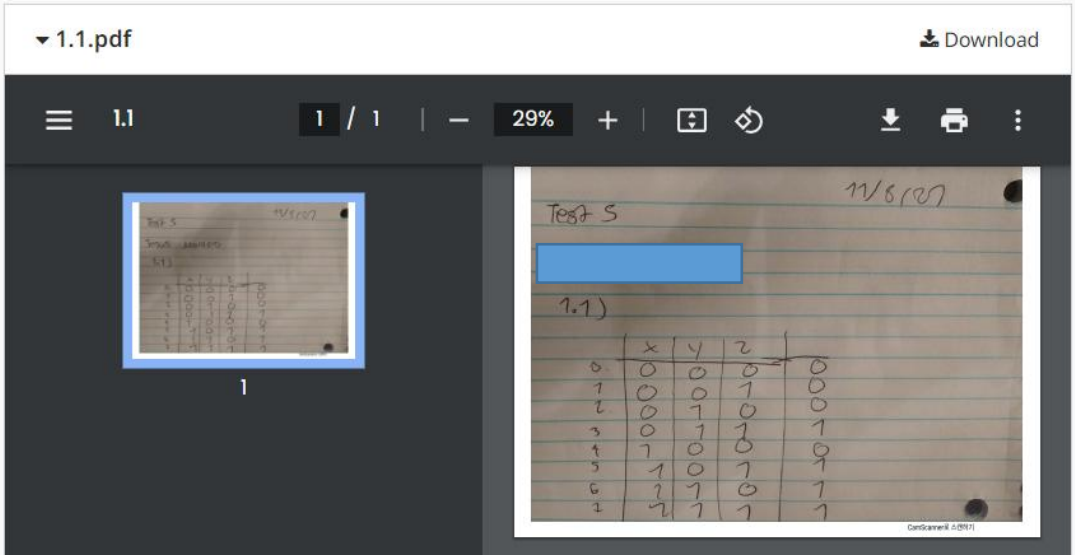
Q1
2 Points

Design a **majority circuit** function with three inputs in the following way:

Q1.1
1 Point

Write the **truth table** of a function $F_3(x, y, z)$, where the output agrees with the majority of the input, that is $F_3(x, y, z) = 1$, if and only if at least two of the three variables: x, y, z have the value 1.



Q1.2
1 Point

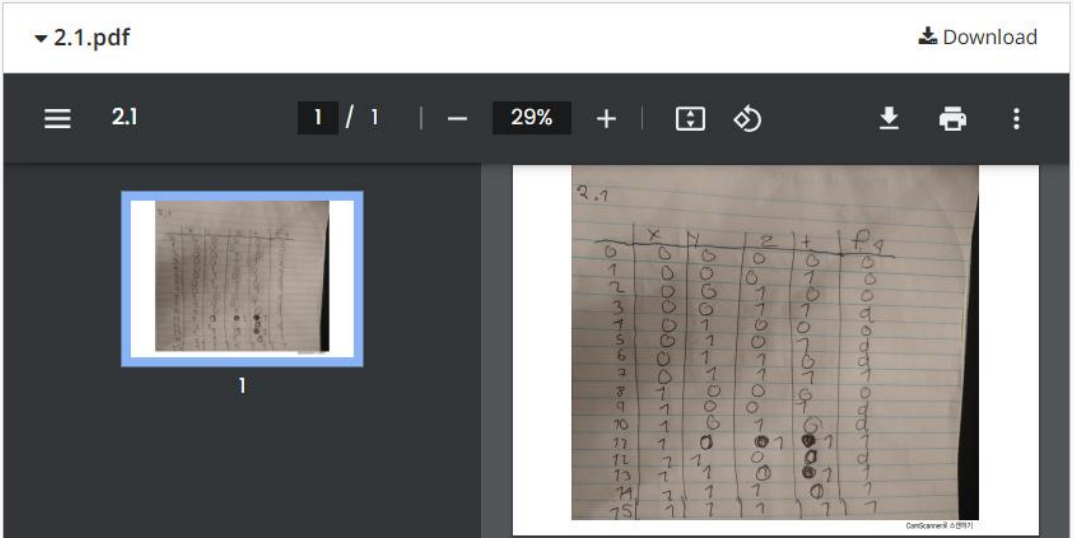
Write the expression of a function $F_3(x, y, z)$ as a sum of minterms, and then minimize it by using a **K-Map**.

Q2
3 Points

Design a **majority circuit** function $F_4(x, y, z, t)$ with four inputs. Handle the **tie conditions** in a way that is **optimal** from the point of view of minimization of F_4.

Q2.1
1 Point

Write the **truth table** for F_4.



Q2.2
1 Point

Draw the **K-Map** for F_4.

Q2.3 Extra Credit
1 Point

Derive all minimal forms of F_4 from the K-Map.