Note that if we calculate $f(X-C_i)$ and then $f(X-C_j)$ then it's the same as calculate $f(X-C_j)$ and then $f(X-C_i)$, so f operates on some inputs more than once. We can save what we already calculated.

We can initialize an array A with indeces from 0 to X, each index i corresponding to amount i that we need to pay. and $A[i]$ will be the minimal number of coins we can pay for amount i

From f we know that index 0 contains 0.

Instead of ∞ in the first condition of f, we can say (4) $X+1$ for the practical case, since the smallest coin can be 1, so the maximum coins we can use to get to X is X