Materials and Methods

(Teori om encoding og decoding)

Encoding for the code vector in systematic form:

$$X^{n-k}m(X) = q(X)g(X) + p(X) \tag{1}$$

By adding the redundancy polynomial to the shifted message polynomial, the encoded vector in systematic form is obtained.

$$c(X) = X^{n-k}m(X) + p(X) \tag{2}$$

A concrete example with the generator polynomial $g(X) = 1 + X^4 + X^6 + X^7 + X^8$ is used to encode the following message polynomial: $m(X) = 1 + X^2 + X^4 + X^6$. The code is a cyclic code, $C_{cyc}(15, 7)$.
First the message is right shifted $n - k$ times.

$$X^{15-7}m(X) = X^8 + X^{10} + X^{12} + X^{14} \tag{3}$$

Find $p(X)$ by taking the remainder from $X^{n-k}m(x)$ divided by $g(X)$.

$$X^8 \tag{4}$$