

Exercise 1

a) Compute the difference data

$$R(n+1) = x(n+1) - x(n)_{\text{prediction}}$$

with the simplest prediction („good for piecewise constant signals“)

$$x_{\text{prediction}} = x(n)$$

and display the result.



b) Compute for the original and the difference image the shortest possible code length in bits/pixel, which is given by the Entropie H.

$$(H_{\text{orig}} = 7.790701277935225 \quad H_{\text{diff}} = 4.50600313602694 \quad)$$

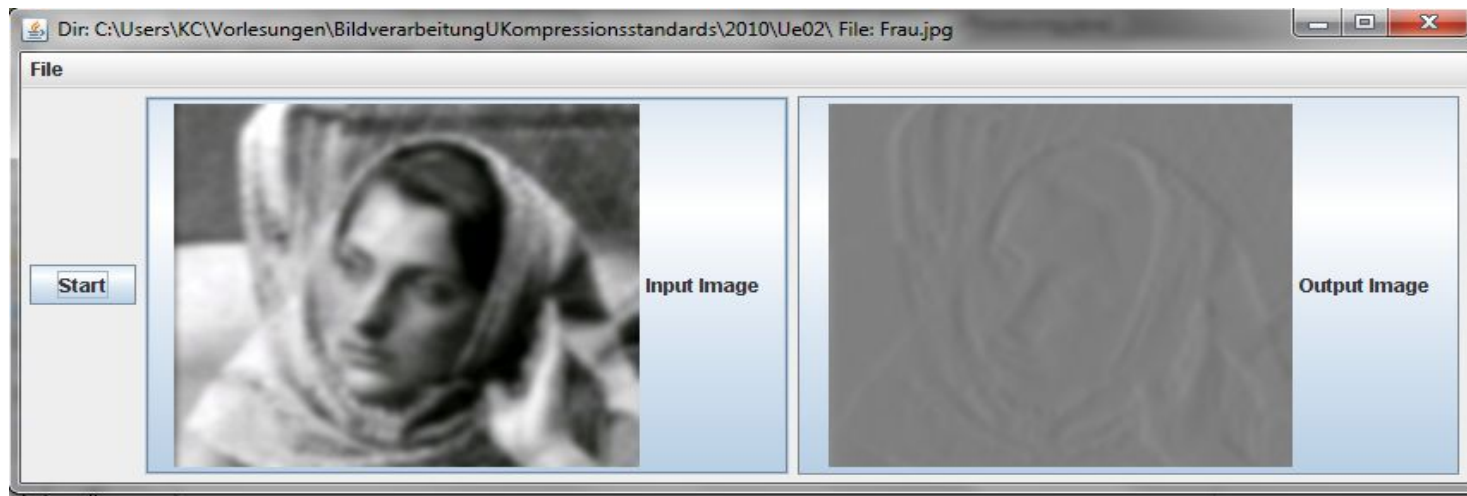
```
public double entropie(double[] p){  
  
    double H=0.0;  
    for(int i=0;i<p.length;i++){  
  
        if ( p[i]> 0.0) H=H - ((p[i]* Math.log(p[i]))/Math.log(2));  
  
    }  
    return H;  
}
```

Exercise 2

Do the same as in Exercise 1 with a better prediction („good for piecewise linear signals“)

$$x_{\text{prediction}} = 2 \cdot x(n) - x(n-1).$$

The simple predictor from Exercise 1 gives $H_{\text{diff}}=4,5$.



Enhanced predictor from Exercise 2 $H_{\text{pred}}=3,13502$

