Given the following predictors and the output variable:
```
y: 0 10 20   30   40   50   60   70   80   90 100
pred1: 0 1   6 15 18 24 26 33 37 42 49
pred2: 1 -3 5 15 22 27 28 35 30 38 49
pred3: 0.00 1.58 1.82 1.97 2.09 2.18 2.26 2.33 2.40 2.45 2.51
pred4:   -5 48   194   443   798 1246 1799 2446 3196 4048 4995
```

[i] generate the scatter plots for all predictors and comment on their relationship with the output variable

[ii] calculate the coefficients and R^2 values for the simple linear regressions for all predictors. Comment the coefficients and R^2 values. Propose a first step for the forward selection.

[iii] on the simple linear regressions, test a non-linear option. Justify your choice of non-linear function. Generate the evaluation plots for all models.

[iv] comment the following multiple linear model
```
Call:
lm(formula = y ~ pred1 + pred2 + pred3 + pred4)

Residuals:
    Min      1Q  Median      3Q     Max
-4.0443 -0.6245  0.3889  0.8521  3.8189

Coefficients:
              Estimate Std. Error t value Pr(>|t|)
(Intercept) -0.237360   2.631506  -0.090   0.9311
pred1        1.613740   0.575488   2.804   0.0310 *
pred2       -0.134739   0.318304  -0.423   0.6868
pred3        5.372330   2.335277   2.301   0.0611 .
pred4        0.003363   0.002738   1.228   0.2653
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 2.621 on 6 degrees of freedom
Multiple R-squared:  0.9963,  Adjusted R-squared:  0.9938
F-statistic: 398.7 on 4 and 6 DF,  p-value: 2.101e-07
```

[v] investigate full forward selection

[vi] investigate full backward selection; comment on convergence

[vii] assess interactions between terms

[viii] consider an additional predictor
```
pred5: 0 0 0 1 1 0 1 1 0 1 1
```
Answer (i) and (ii) wrt pred5; generate also the full linear model.

[ix] consider an additional predictor
```
Pred6: 2 0 0 0 2 1 3 1 3 1 1
```
Answer (i) and (ii) wrt pred5; generate also the full linear model. Try the forward and backward selection. Look for interactions. Generate the best possible model for this data.