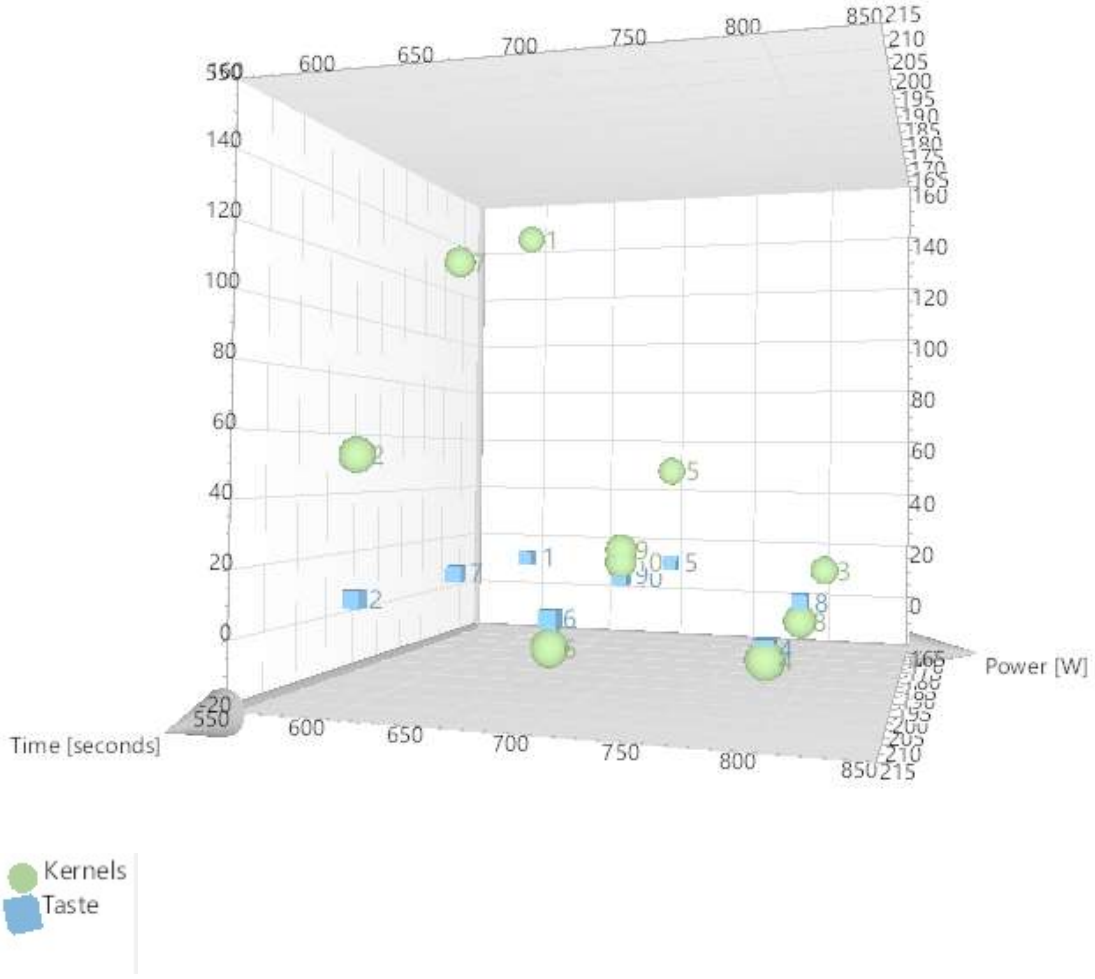
ENGR 599 Activity 4

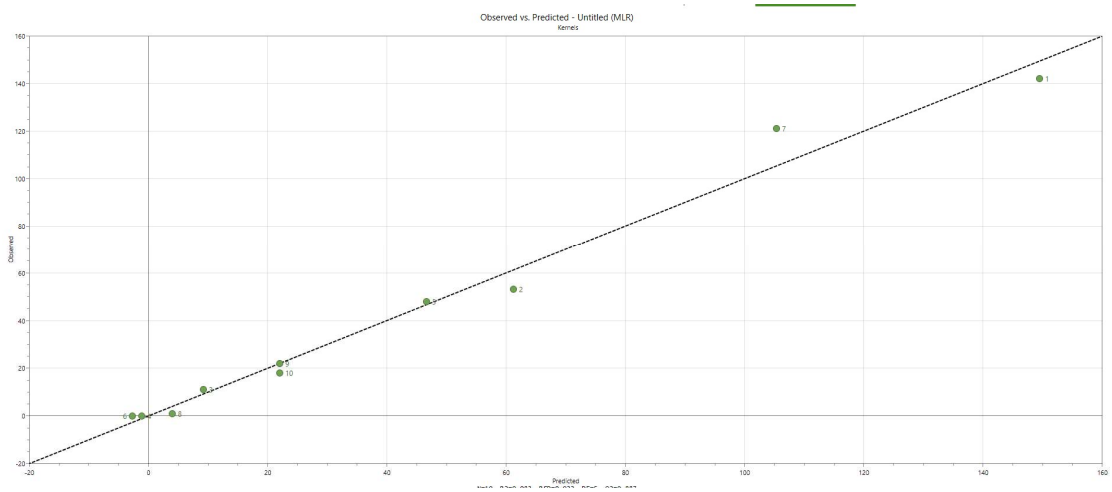
Adrian Henle

Exercise 111

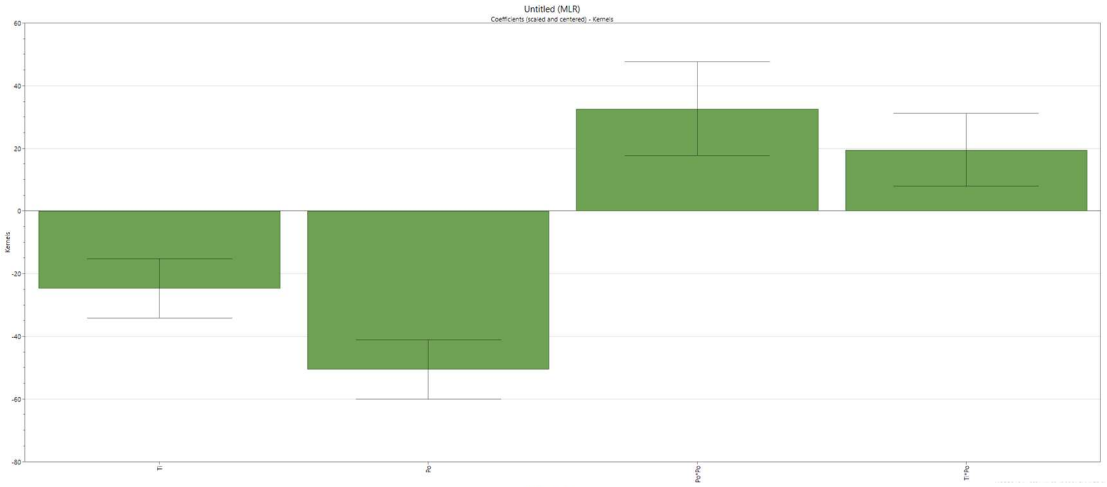
Task 1

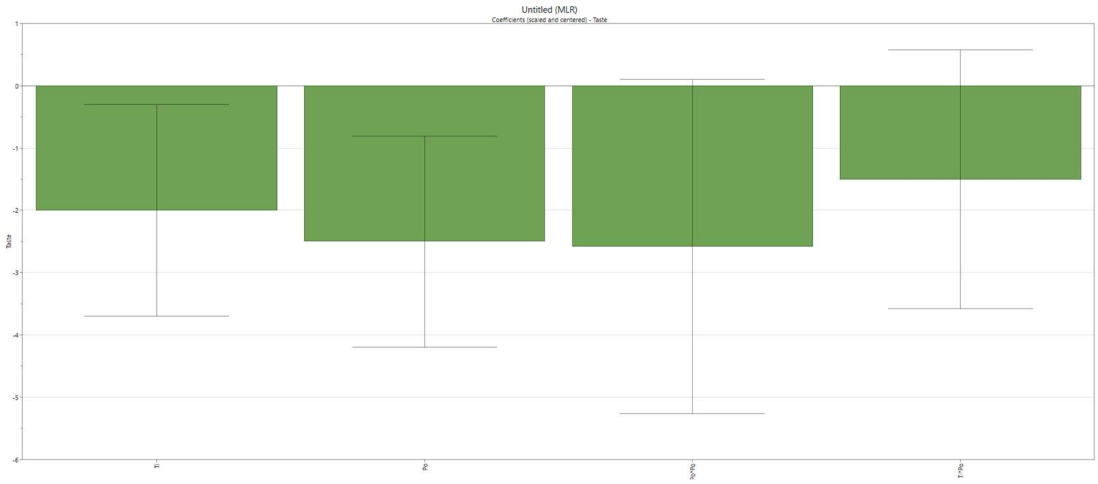


Task 2



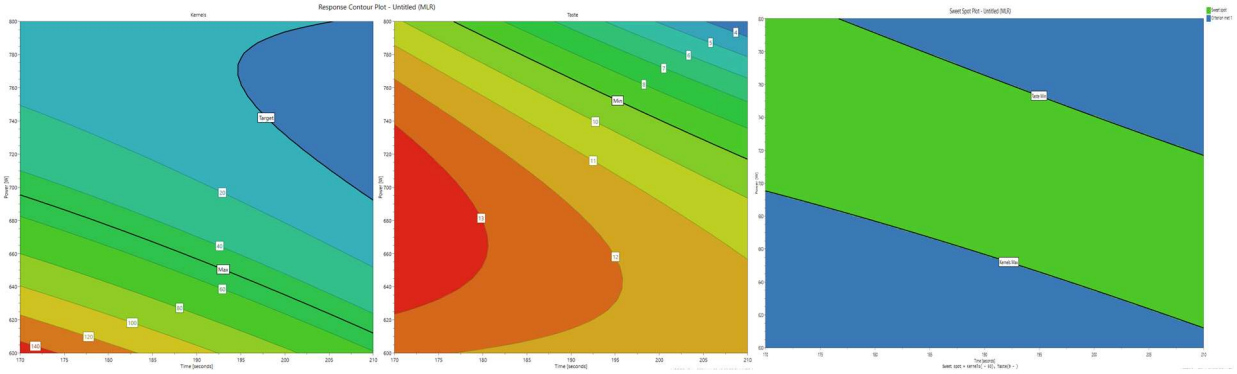

The model's $R^2$ is a nice $0.983$

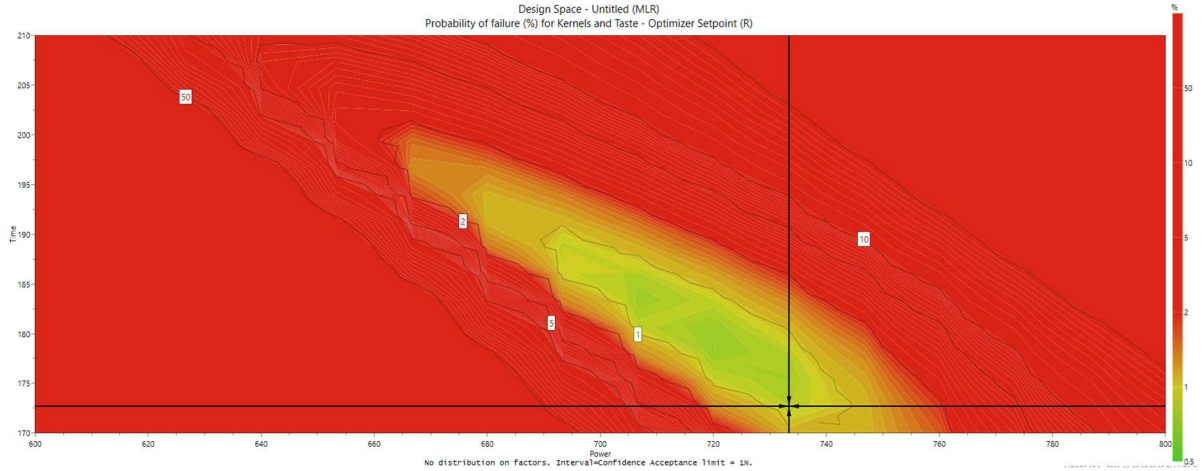


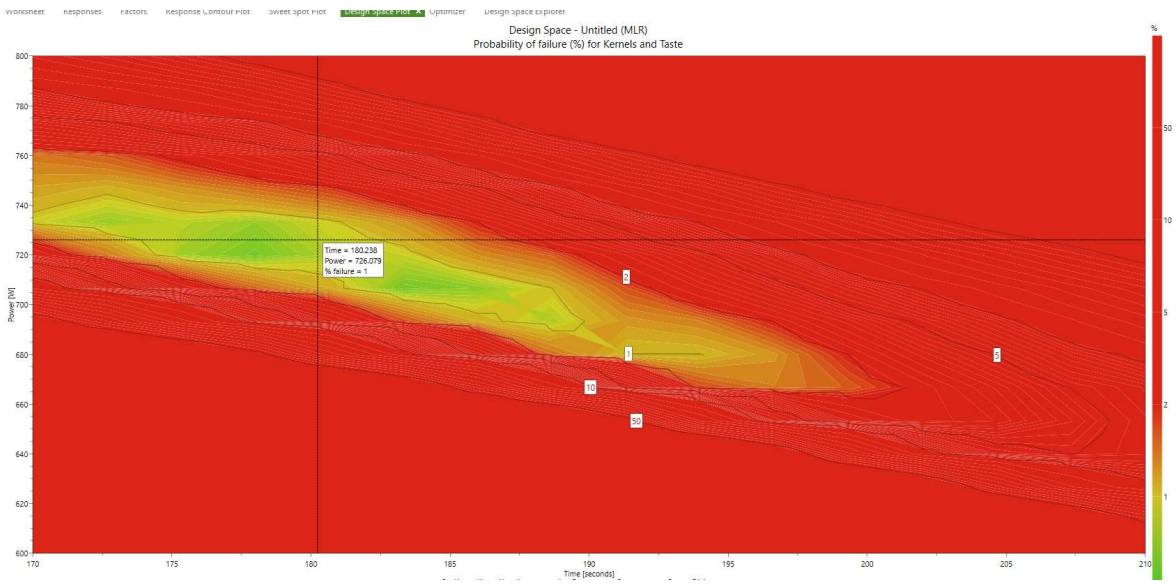

Maximizing taste requires low power and short time. Minimizing kernels requires time and moderate power.

Task 3



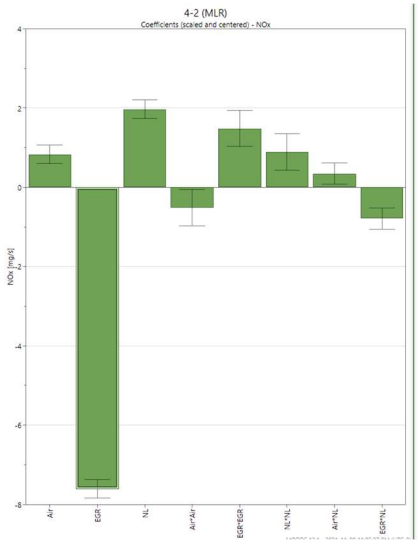

Optimizer says 2:53 at 730 Watts is the best. 12.8 taste points with only 24 kernels.

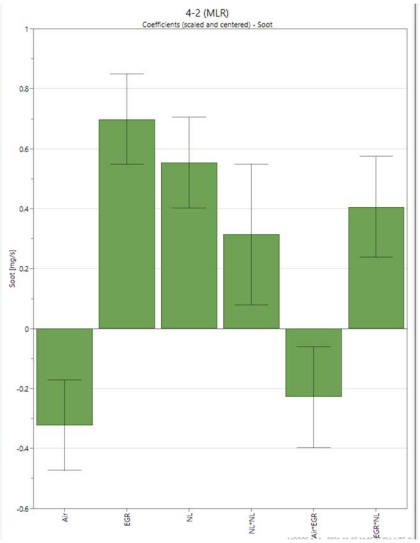


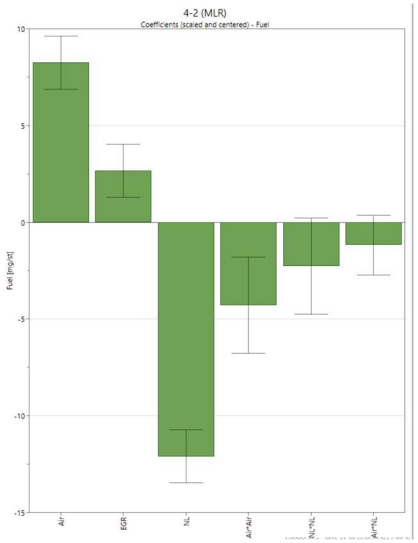

I would probably go with 3:00 at 725 Watts, to give a 5-Watt margin for microwave output. 12.1 taste, 21 kernels.

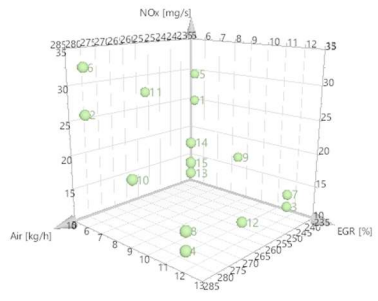
Exercise 112

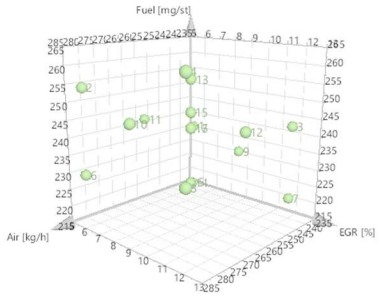
Tasks 1-2

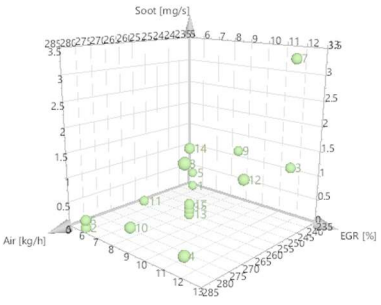


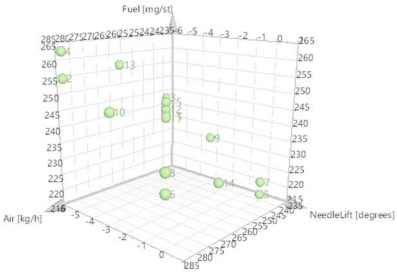



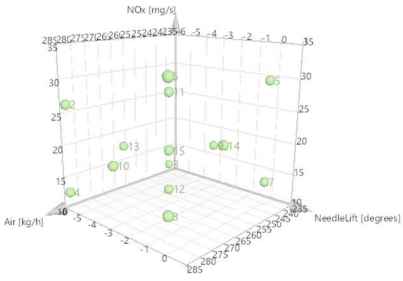



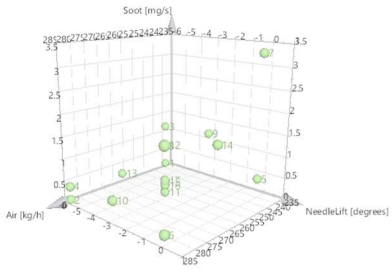



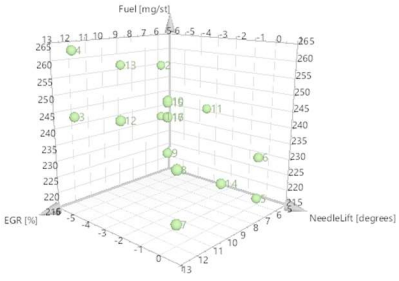



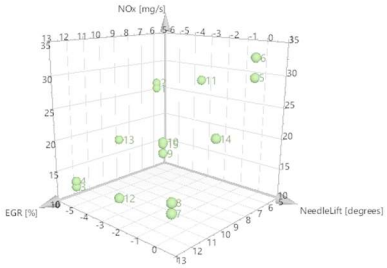



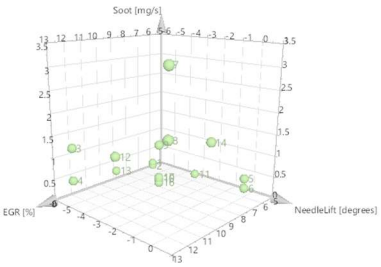



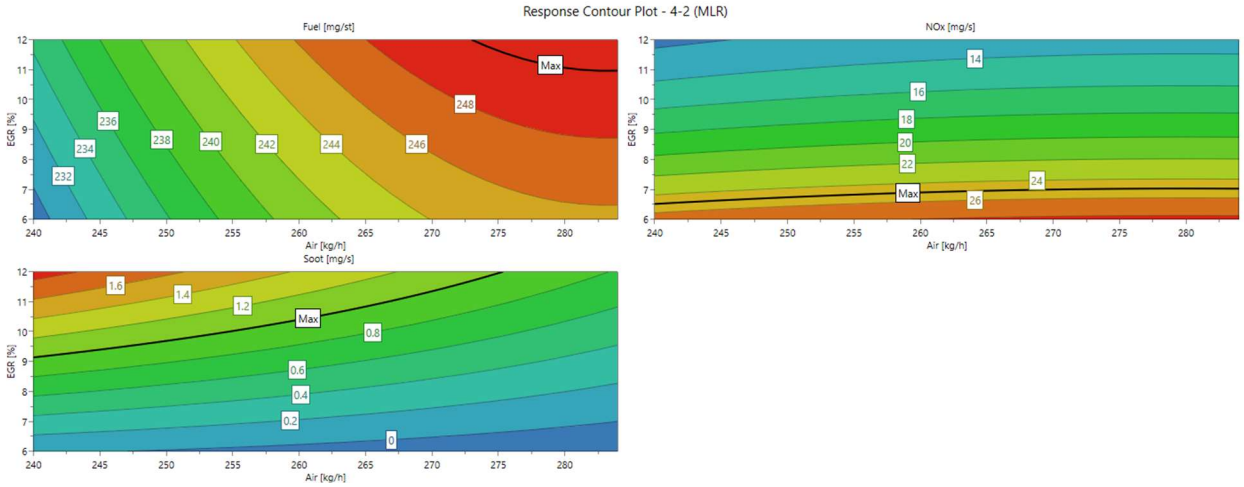



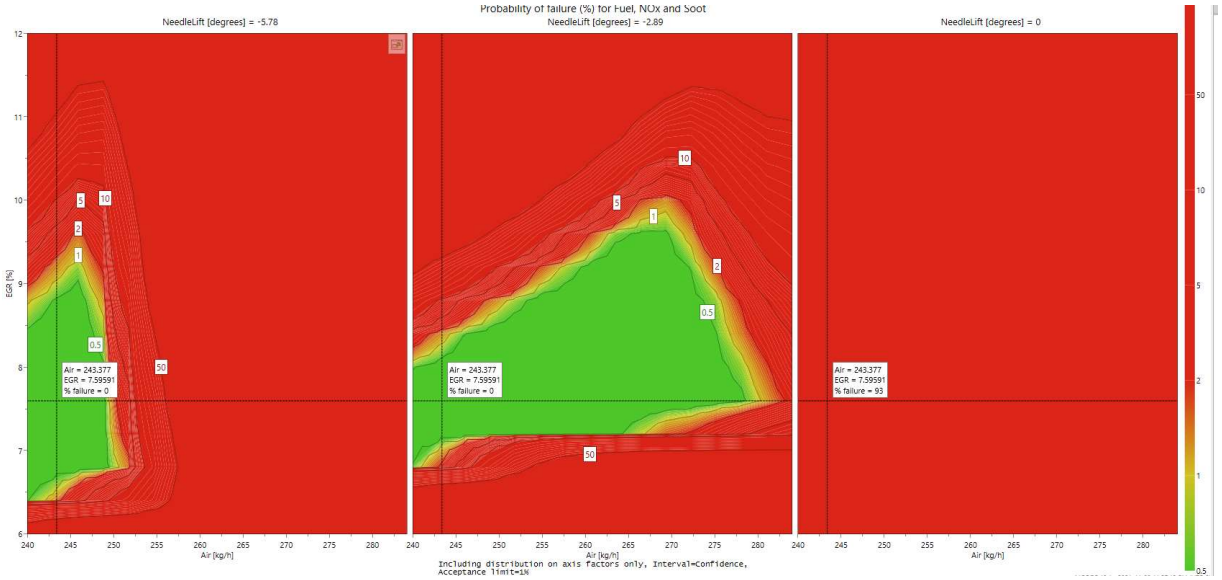



Task 3




Task 4




The optimizer says to go with 240 m/s air, 7.9 % EGR, and a needle lift of -4.2 °.

Task 5

Setpoint analysis says to go with 247 m/s air, 7.9 % EGR, and -4.5 ° needle lift to achieve less than 1 % probability of failure on any response.

Task 6

The robust setpoint is at 249 m/s air, 8 % EGR, and -4.2 ° needle lift.