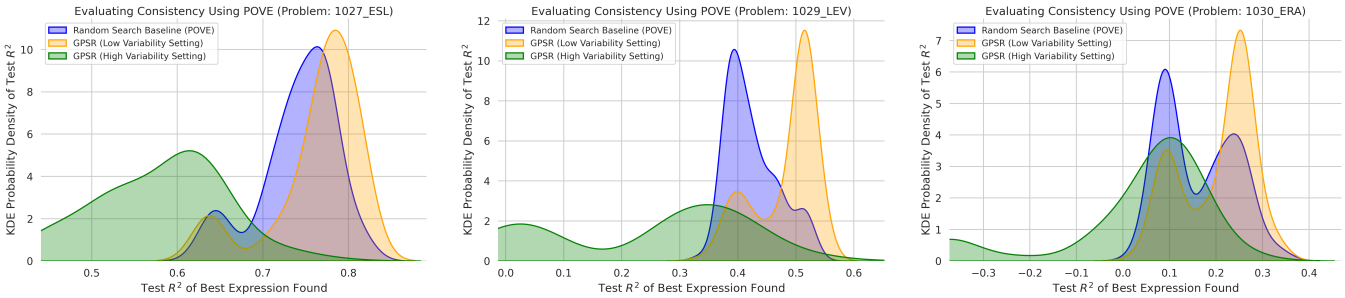
A All Consistency Plots

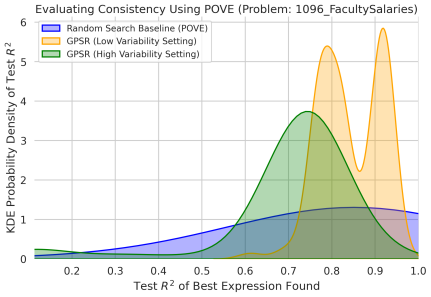
GPSR (high variability setting) uses a small population (20 individuals) evolved over many generations (200) with low operator probabilities, $p_{\text{crossover}} = 0.09$, $p_{\text{mutation}} = 0.001$, while GPSR (low variability setting) employs a large population (200 individuals) evolved over few generations (20) with high operator probabilities $p_{\text{crossover}} = 0.9$, $p_{\text{mutation}} = 0.01$.



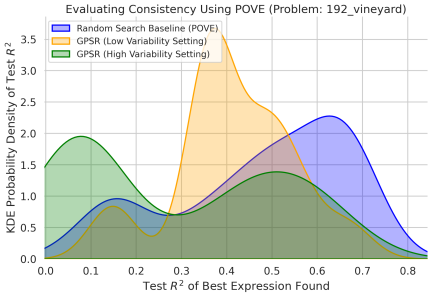
(a) 1027_ESL

(b) 1029_LEV

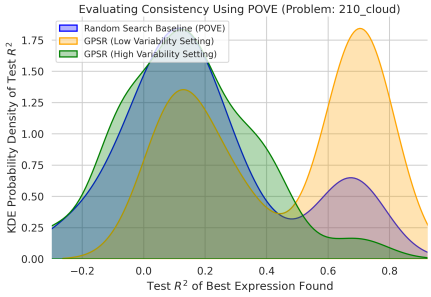
(c) 1030_ERA



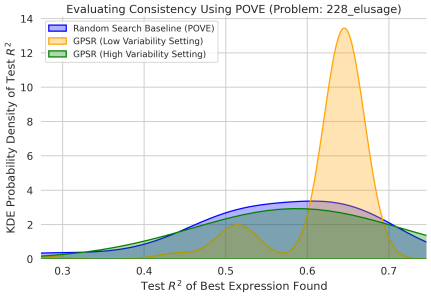
(d) 1096_FacultySalaries



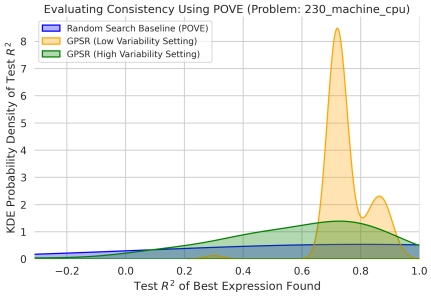
(e) 192_vineyard



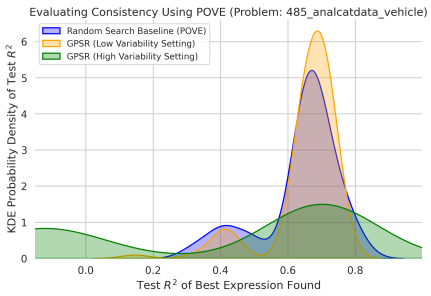
(f) 210_cloud



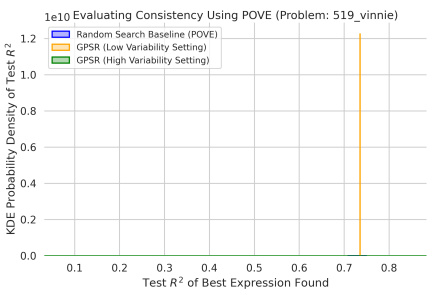
(g) 228_elusage



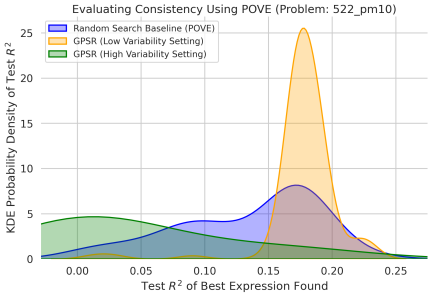
(h) 230_machine_cpu



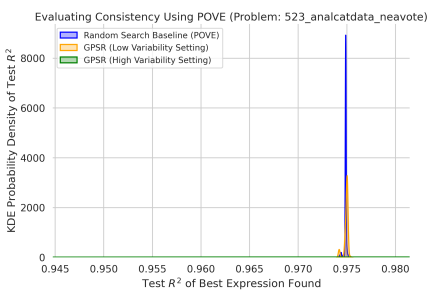
(i) 485_analcatdata_vehicle



(j) 519_vinnie

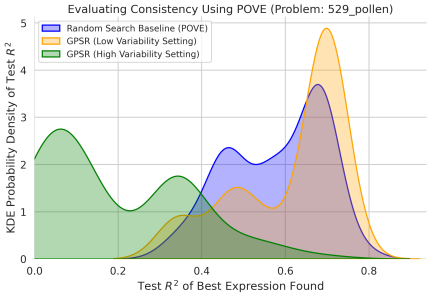


(k) 522_pm10

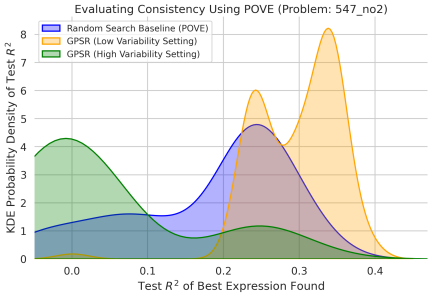


(l) 523_analcatdata_neavote

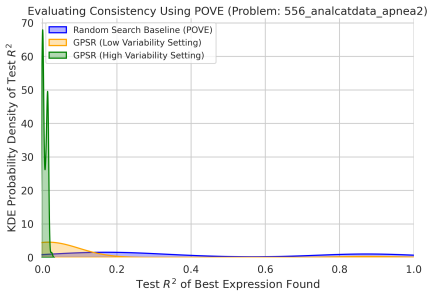
Figure 1: 1st to 12th problem



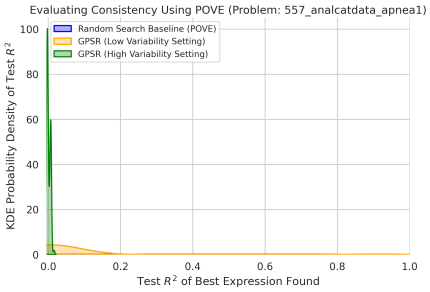
(a) 529_pollen



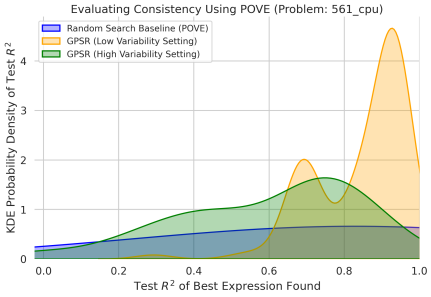
(b) 547_no2



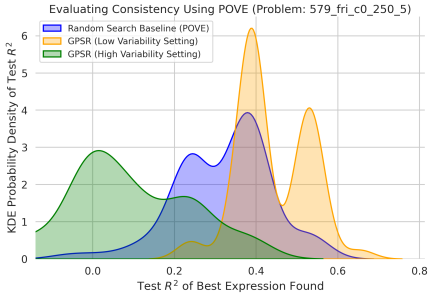
(c) 556_analcatdata_apnea2



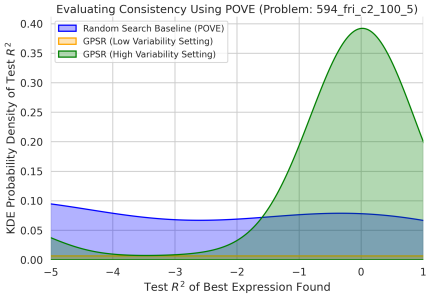
(d) 557_analcatdata_apnea1



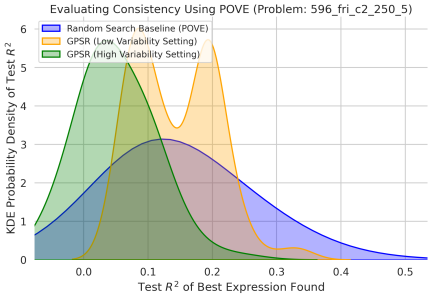
(e) 561_cpu



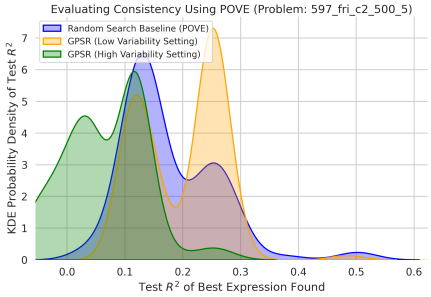
(f) 579_fri_c0_250_5



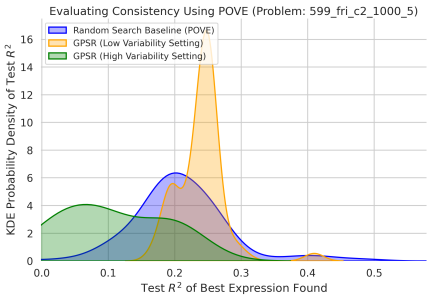
(g) 594_fri_c2_100_5



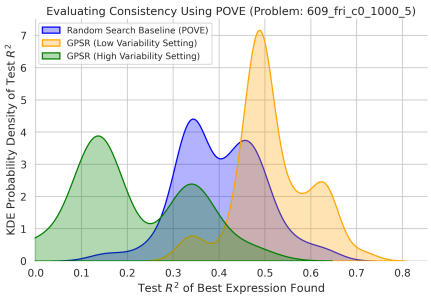
(h) 596_fri_c2_250_5



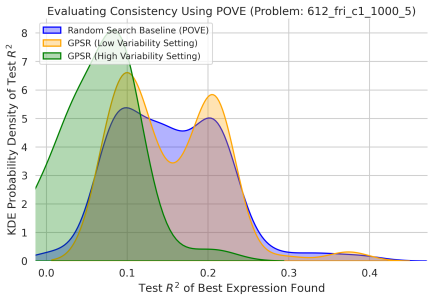
(i) 597_fri_c2_500_5



(j) 599_fri_c2_1000_5

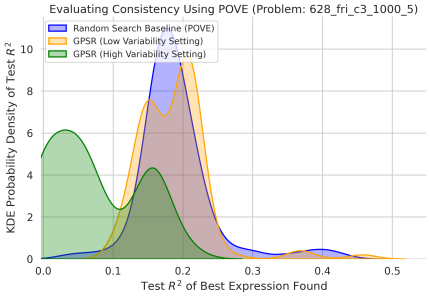


(k) 609_fri_c0_1000_5

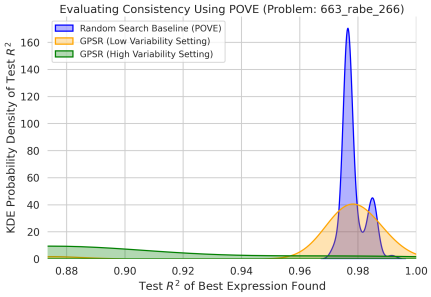


(l) 612_fri_c1_1000_5

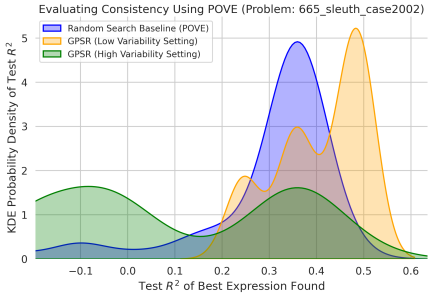
Figure 2: 13th to 24th problem



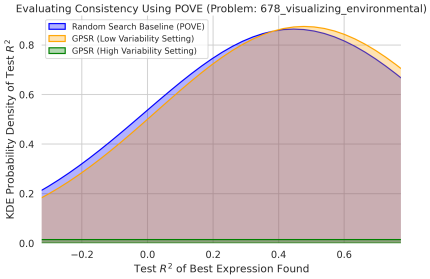
(a) 628_fri_c3_1000_5



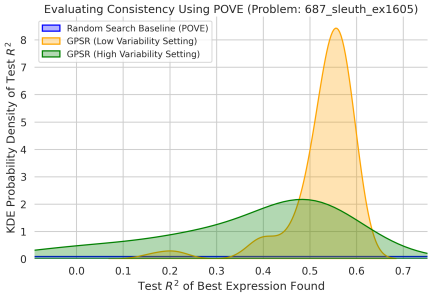
(b) 663_rabe_266



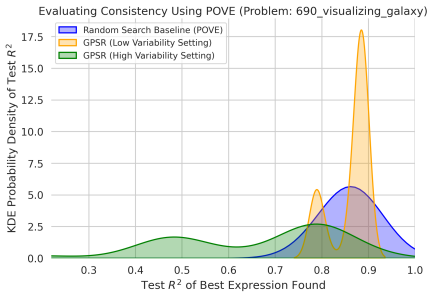
(c) 665_sleuth_case2002



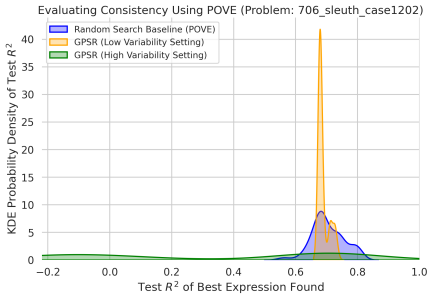
(d) 678_visualizing_environmental



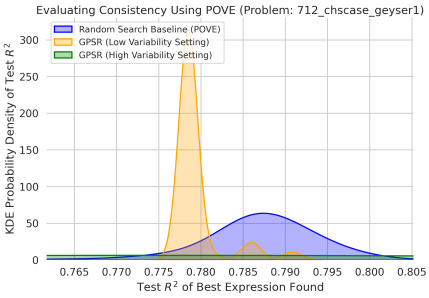
(e) 687_sleuth_ex1605



(f) 690_visualizing_galaxy



(g) 706_sleuth_case1202



(h) 712_chscase_geyser1

Figure 3: 25th to 32nd problem

B Other Benchmarking Plots

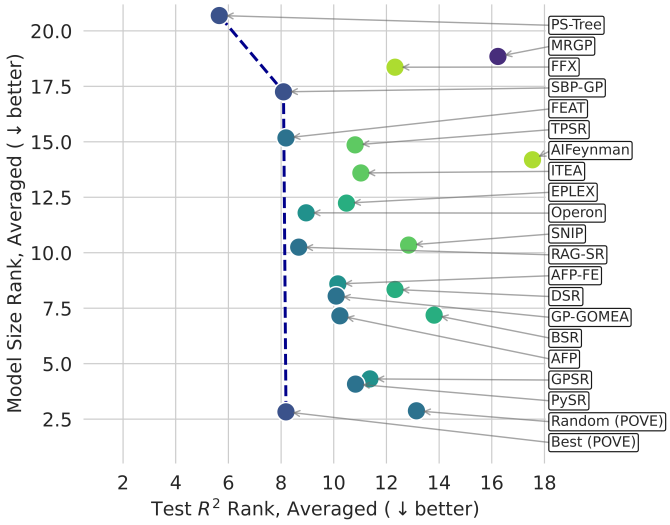


Figure 4: Rank-based Pareto frontier of mean model size and test R^2. This is more common in SR literature, but ranking removes the difference in magnitude of the metrics. The Pareto frontier showed in the main paper is preferred.

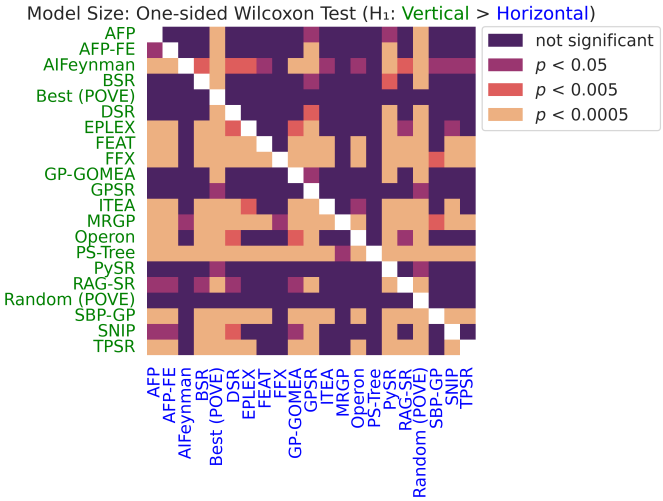
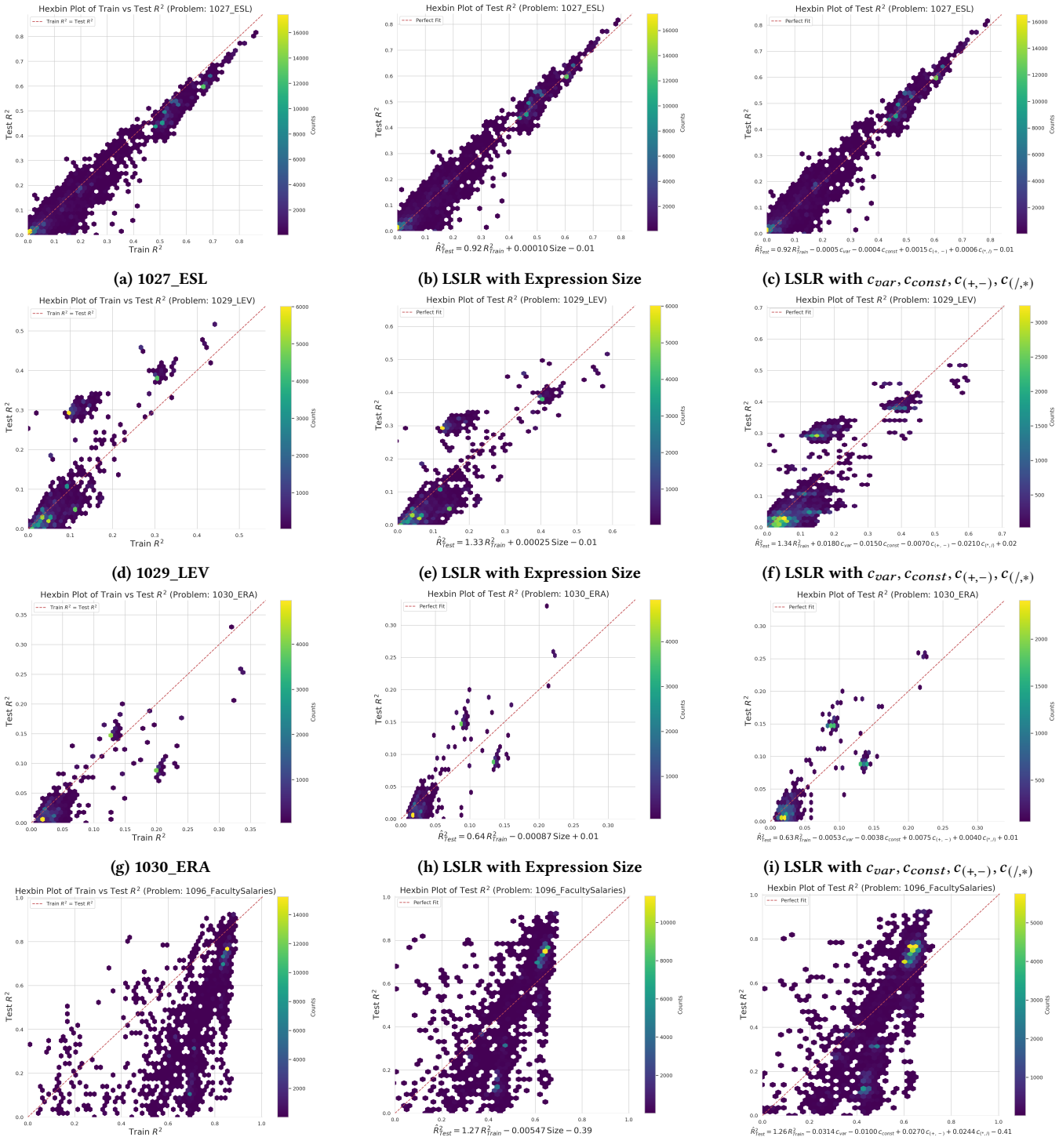


Figure 5: Pairwise one-sided Wilcoxon signed-rank test statistical test on model size.

C All Generalization and Optimal Parsimony Penalty Plots



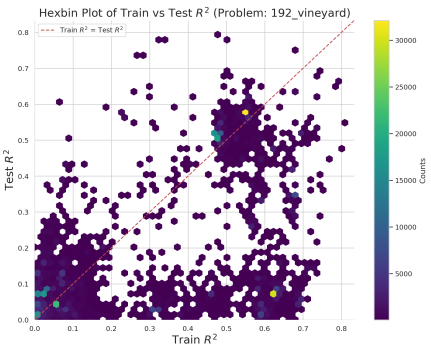
(a) 1027_ESL **(b) LSLR with Expression Size** **(c) LSLR with $c_{var}, c_{const}, c_{(+,-)}, c_{(/,*)}$**

(d) 1029_LEV **(e) LSLR with Expression Size** **(f) LSLR with $c_{var}, c_{const}, c_{(+,-)}, c_{(/,*)}$**

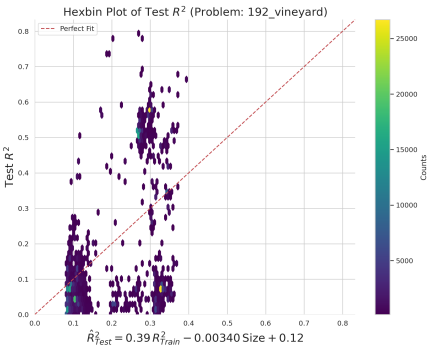
(g) 1030_ERA **(h) LSLR with Expression Size** **(i) LSLR with $c_{var}, c_{const}, c_{(+,-)}, c_{(/,*)}$**

(j) 1096_FacultySalaries **(k) LSLR with Expression Size** **(l) LSLR with $c_{var}, c_{const}, c_{(+,-)}, c_{(/,*)}$**

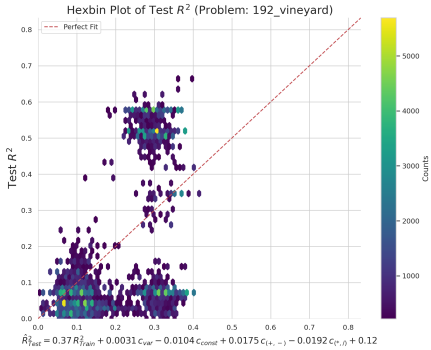
Figure 6: Problems from 1027_ESL to 1096_FacultySalaries



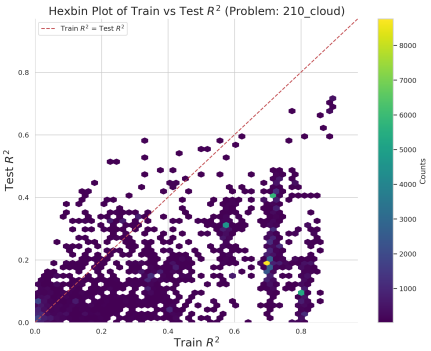
(a) 192_vineyard



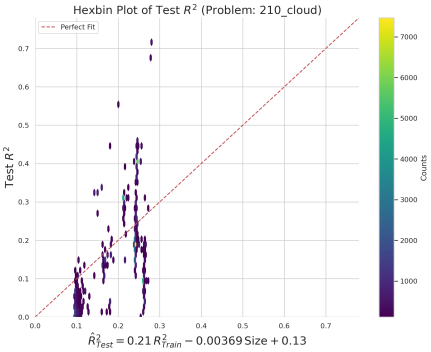
(b) LSLR with Expression Size



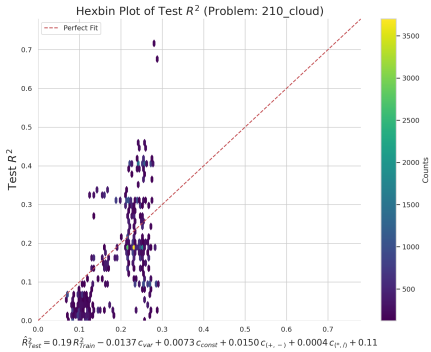
(c) LSLR with $c_{var}, c_{const}, c_{(+,-)}, c_{(/,*)}$



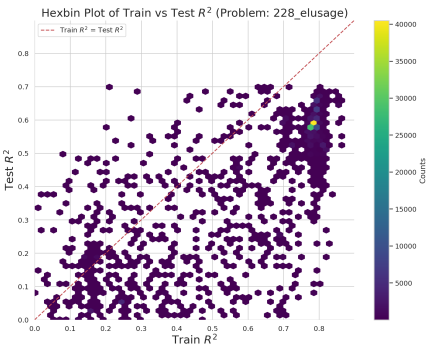
(d) 210_cloud



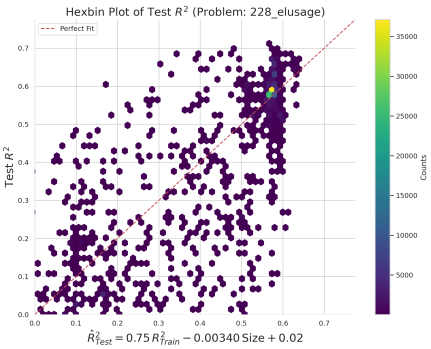
(e) LSLR with Expression Size



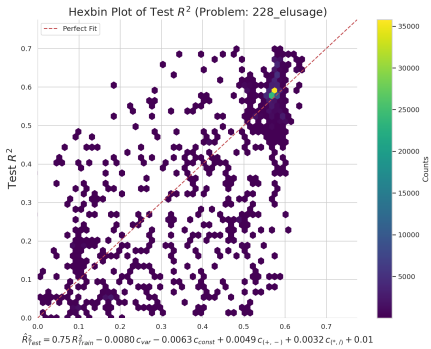
(f) LSLR with $c_{var}, c_{const}, c_{(+,-)}, c_{(/,*)}$



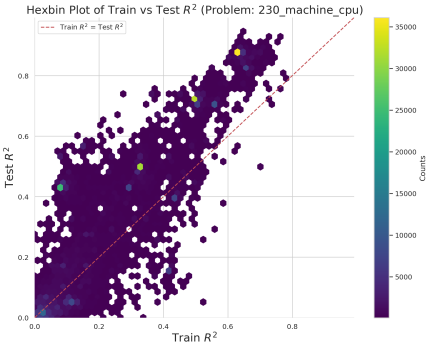
(g) 228_elusage



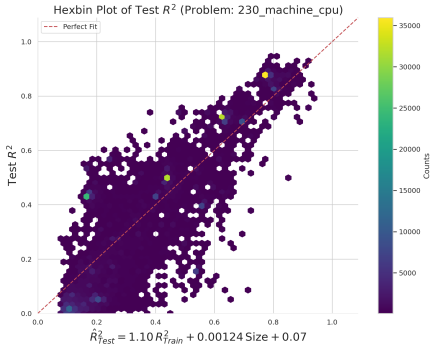
(h) LSLR with Expression Size



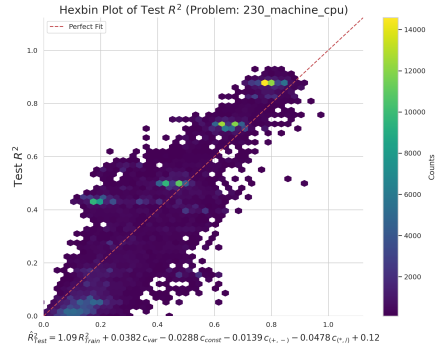
(i) LSLR with $c_{var}, c_{const}, c_{(+,-)}, c_{(/,*)}$



(j) 230_machine_cpu

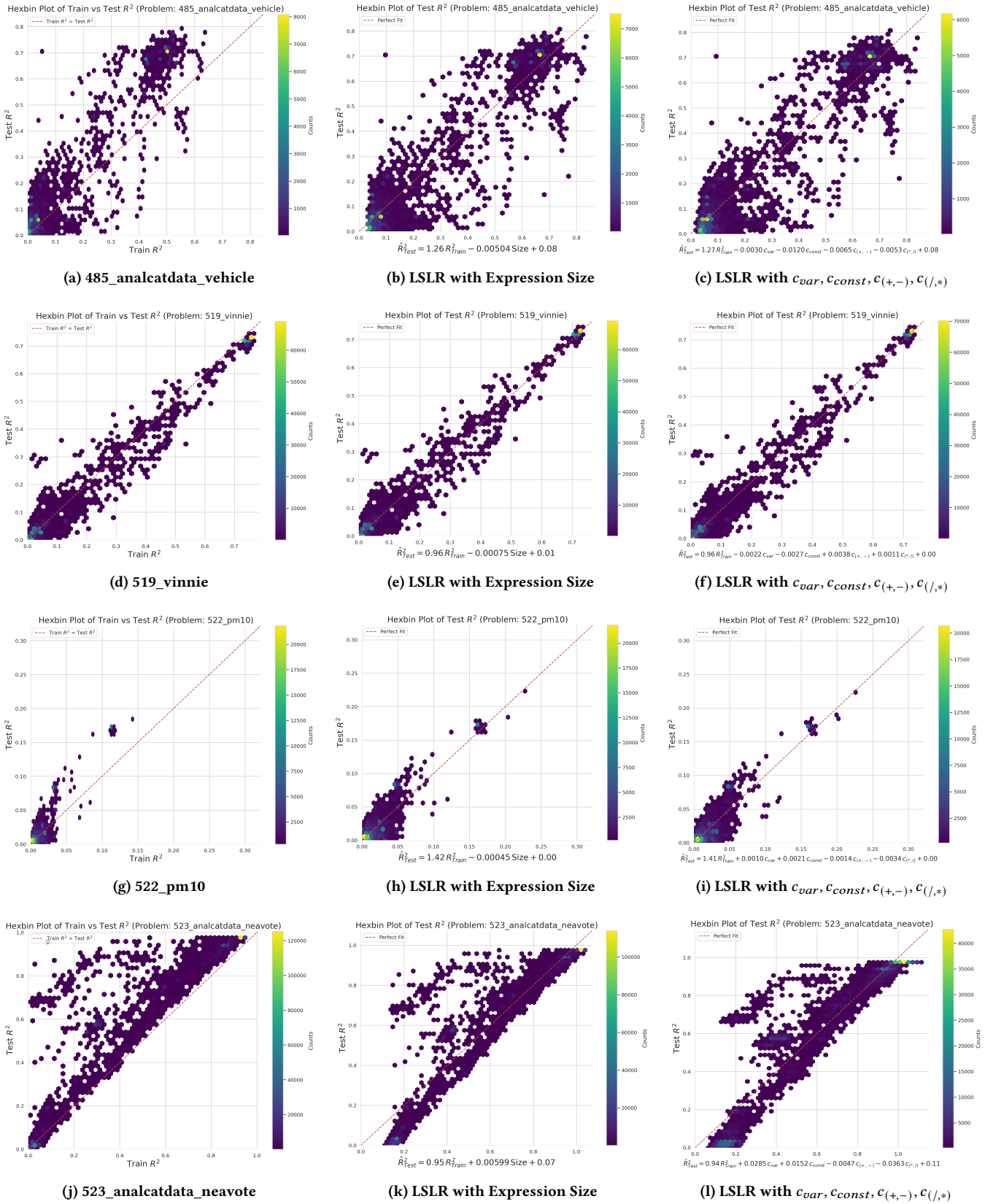


(k) LSLR with Expression Size



(l) LSLR with $c_{var}, c_{const}, c_{(+,-)}, c_{(/,*)}$

Figure 7: Problems from 192_vineyard to 230_machine_cpu



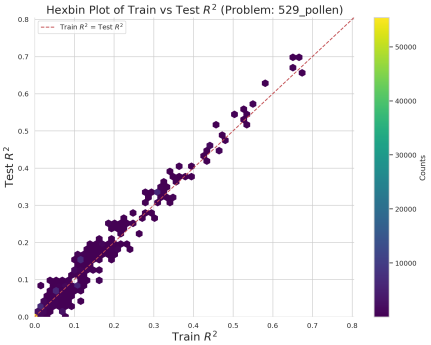
(a) 485_analcatdata_vehicle **(b) LSLR with Expression Size** **(c) LSLR with $c_{var}, c_{const}, c_{(+,-)}, c_{(/,*)}$**

(d) 519_vinnie **(e) LSLR with Expression Size** **(f) LSLR with $c_{var}, c_{const}, c_{(+,-)}, c_{(/,*)}$**

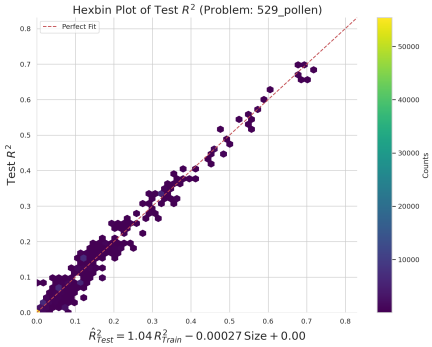
(g) 522_pm10 **(h) LSLR with Expression Size** **(i) LSLR with $c_{var}, c_{const}, c_{(+,-)}, c_{(/,*)}$**

(j) 523_analcatdata_neavote **(k) LSLR with Expression Size** **(l) LSLR with $c_{var}, c_{const}, c_{(+,-)}, c_{(/,*)}$**

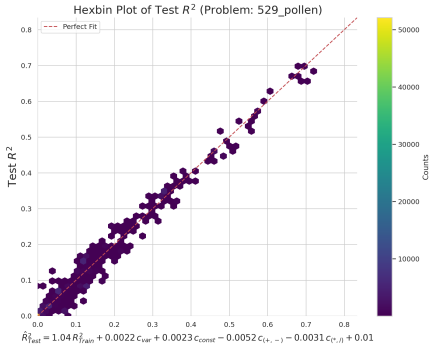
Figure 8: Problems from 485_analcatdata_vehicle to 523_analcatdata_neavote



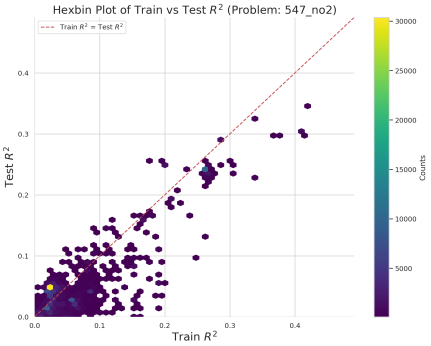
(a) 529_pollen



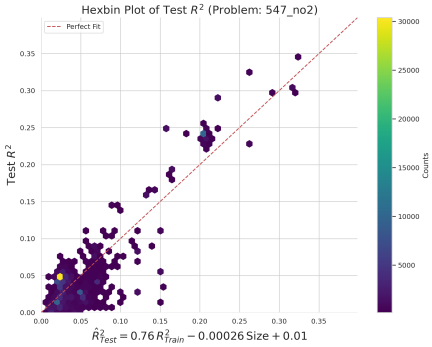
(b) LSLR with Expression Size



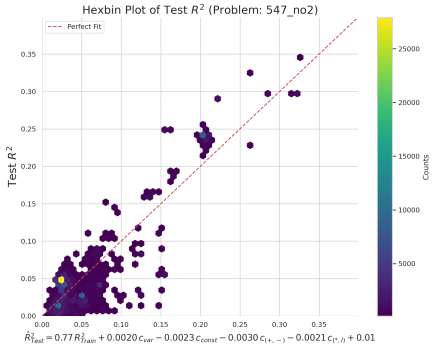
(c) LSLR with $c_{var}, c_{const}, c_{(+,-)}, c_{(/,*)}$



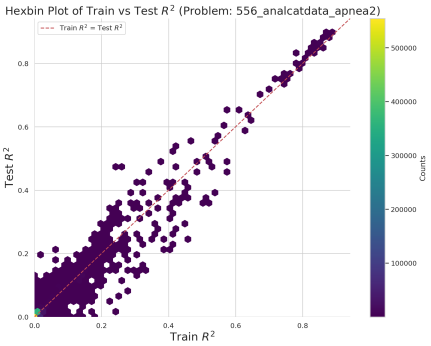
(d) 547_no2



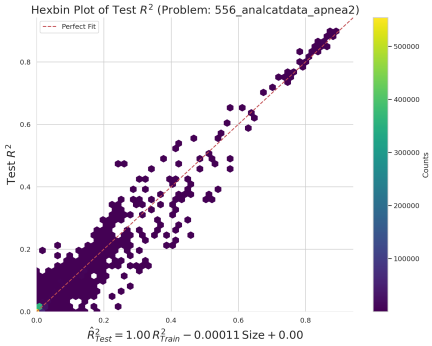
(e) LSLR with Expression Size



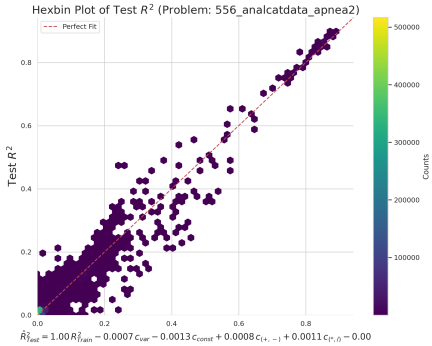
(f) LSLR with $c_{var}, c_{const}, c_{(+,-)}, c_{(/,*)}$



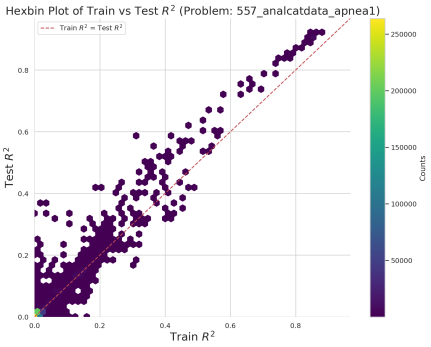
(g) 556_analcatdata_apnea2



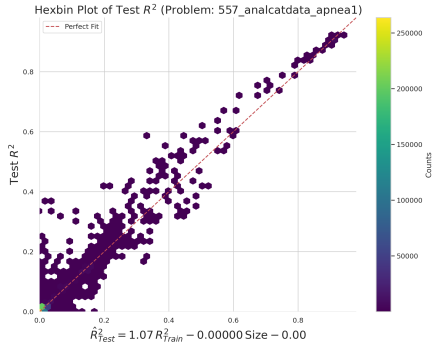
(h) LSLR with Expression Size



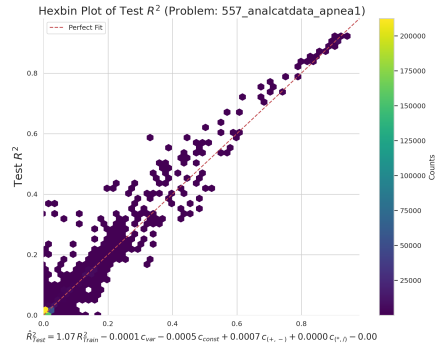
(i) LSLR with $c_{var}, c_{const}, c_{(+,-)}, c_{(/,*)}$



(j) 557_analcatdata_apnea1

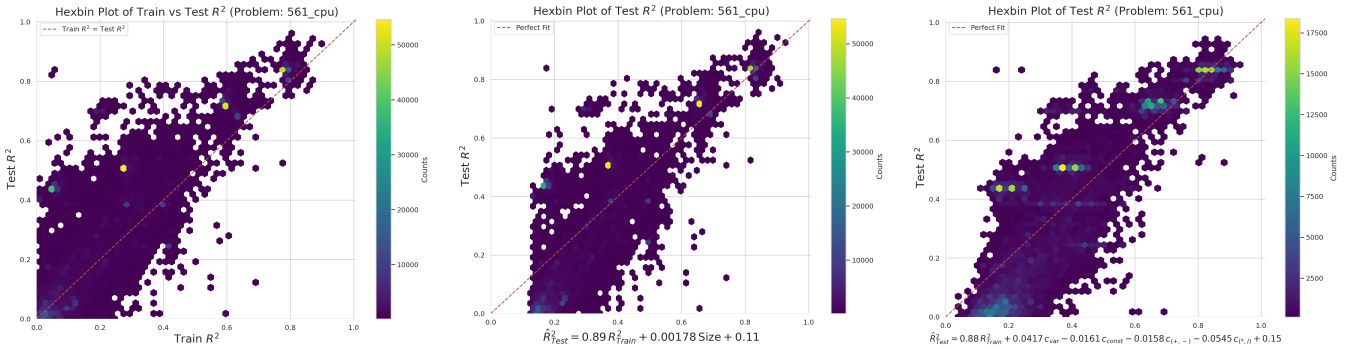


(k) LSLR with Expression Size

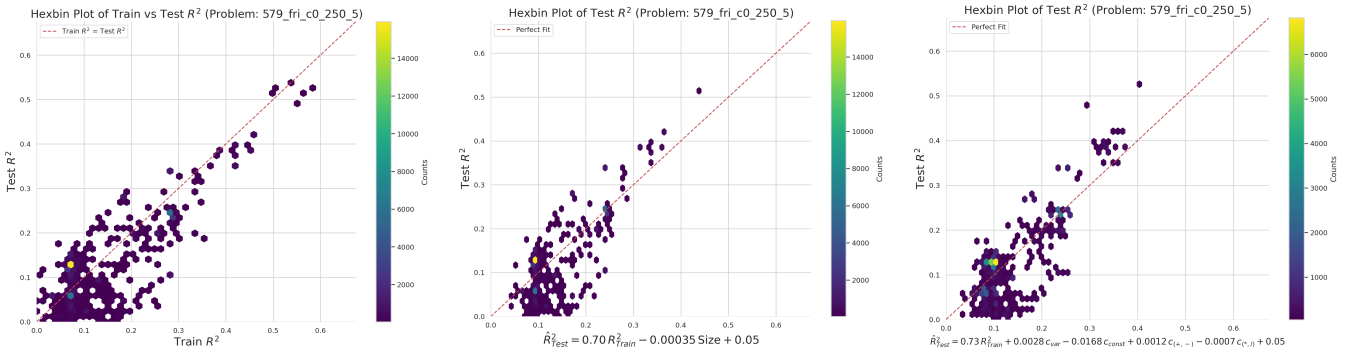


(l) LSLR with $c_{var}, c_{const}, c_{(+,-)}, c_{(/,*)}$

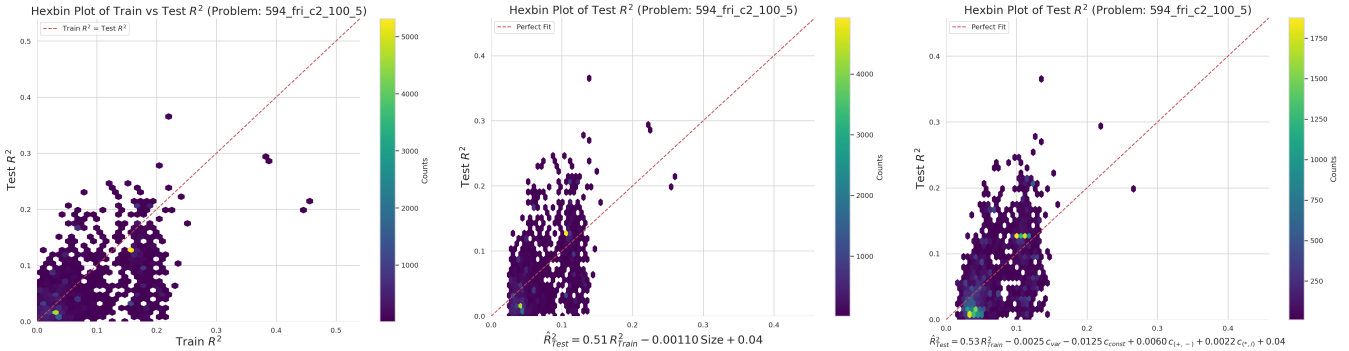
Figure 9: Problems from 529_pollen to 557_analcatdata_apnea1



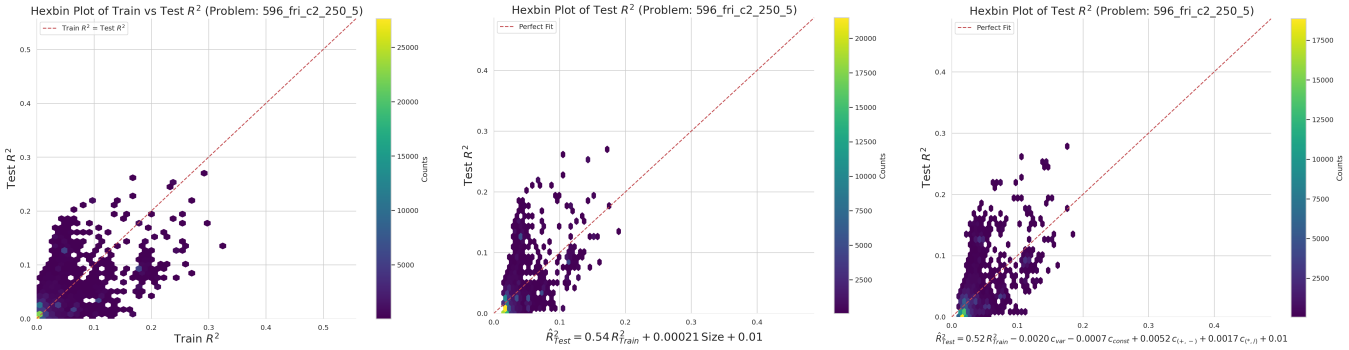
(a) 561_cpu **(b) LSLR with Expression Size** **(c) LSLR with $c_{var}, c_{const}, c_{(+,-)}, c_{(/,*)}$**



(d) 579_fri_c0_250_5 **(e) LSLR with Expression Size** **(f) LSLR with $c_{var}, c_{const}, c_{(+,-)}, c_{(/,*)}$**

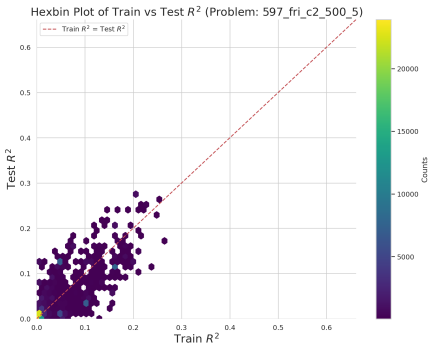


(g) 594_fri_c2_100_5 **(h) LSLR with Expression Size** **(i) LSLR with $c_{var}, c_{const}, c_{(+,-)}, c_{(/,*)}$**

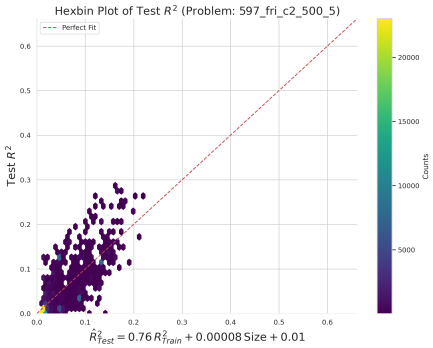


(j) 596_fri_c2_250_5 **(k) LSLR with Expression Size** **(l) LSLR with $c_{var}, c_{const}, c_{(+,-)}, c_{(/,*)}$**

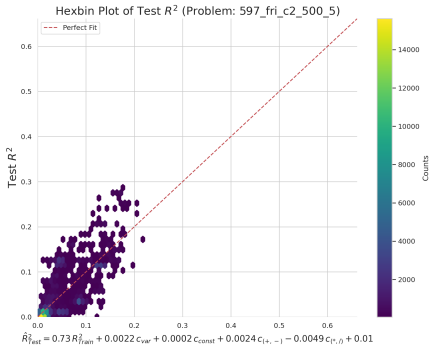
Figure 10: Problems from 561_cpu to 596_fri_c2_250_5



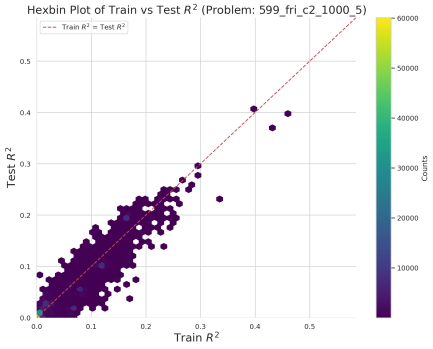
(a) 597_fri_c2_500_5



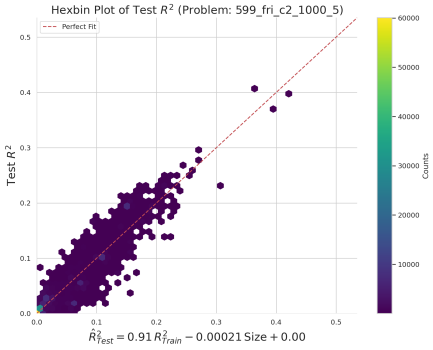
(b) LSLR with Expression Size



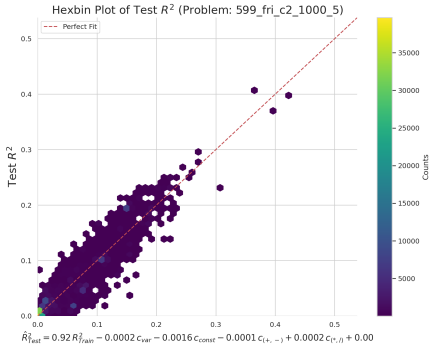
(c) LSLR with $c_{var}, c_{const}, c_{(+,-)}, c_{(/,*)}$



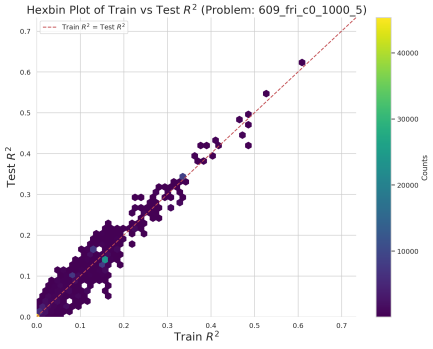
(d) 599_fri_c2_1000_5



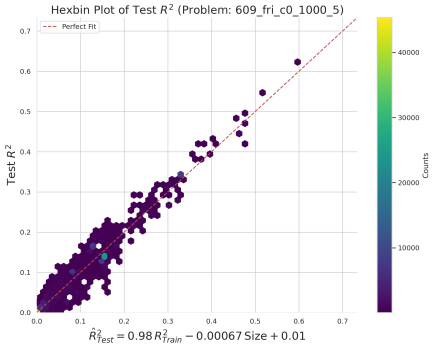
(e) LSLR with Expression Size



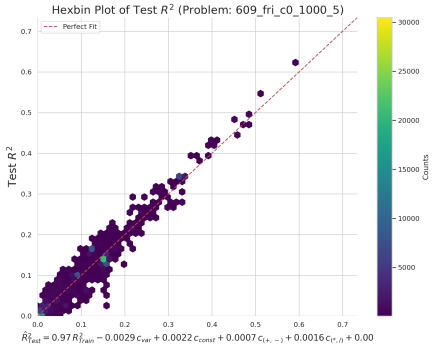
(f) LSLR with $c_{var}, c_{const}, c_{(+,-)}, c_{(/,*)}$



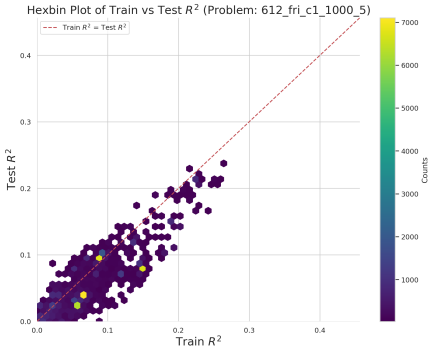
(g) 609_fri_c0_1000_5



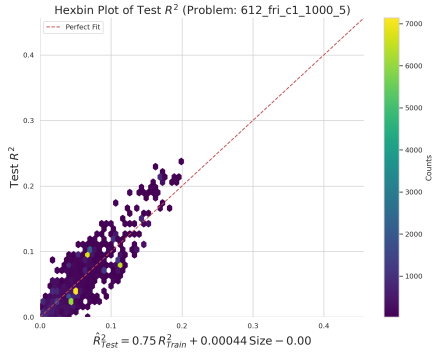
(h) LSLR with Expression Size



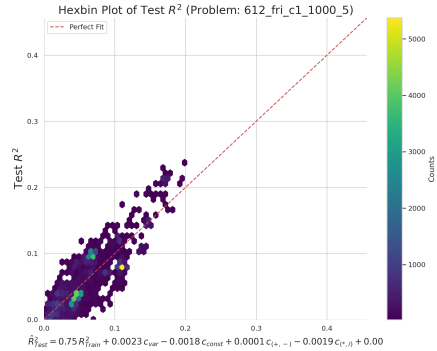
(i) LSLR with $c_{var}, c_{const}, c_{(+,-)}, c_{(/,*)}$



(j) 612_fri_c1_1000_5

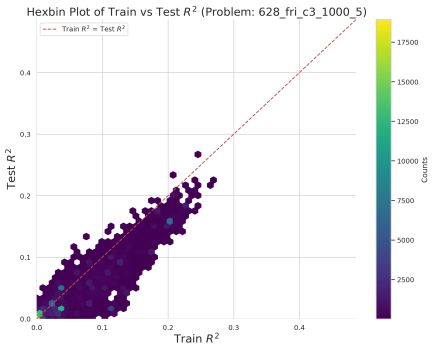


(k) LSLR with Expression Size

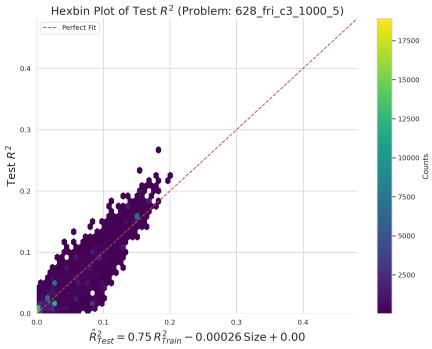


(l) LSLR with $c_{var}, c_{const}, c_{(+,-)}, c_{(/,*)}$

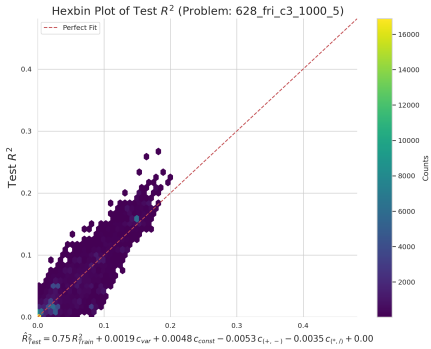
Figure 11: Problems from 597_fri_c2_500_5 to 612_fri_c1_1000_5



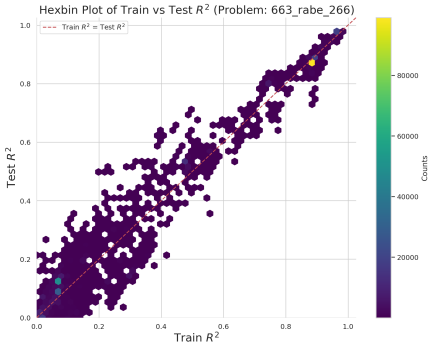
(a) 628_fri_c3_1000_5



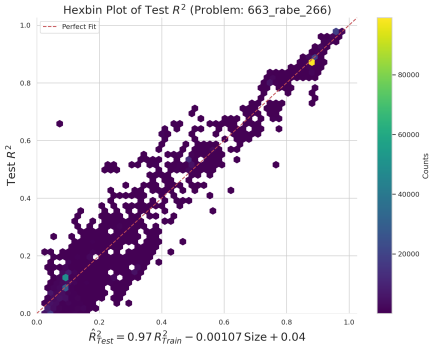
(b) LSLR with Expression Size



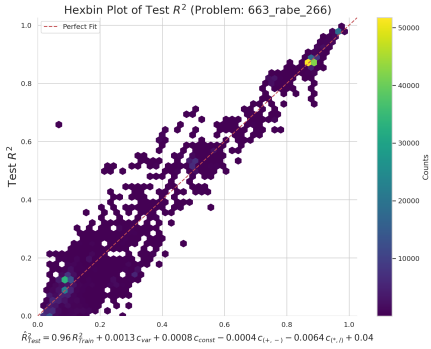
(c) LSLR with $c_{var}, c_{const}, c_{(+,-)}, c_{(/,*)}$



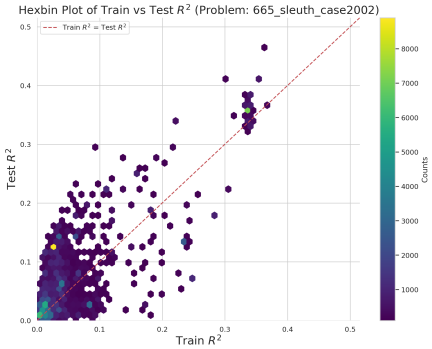
(d) 663_rabe_266



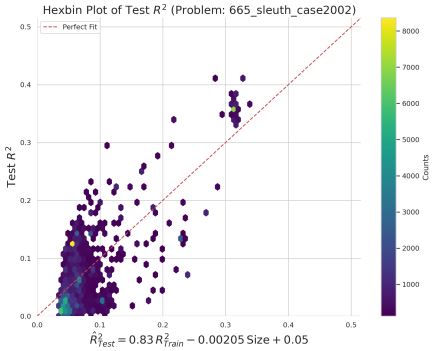
(e) LSLR with Expression Size



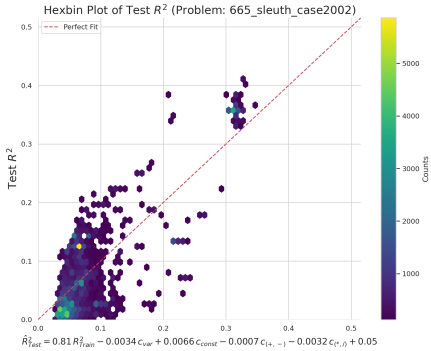
(f) LSLR with $c_{var}, c_{const}, c_{(+,-)}, c_{(/,*)}$



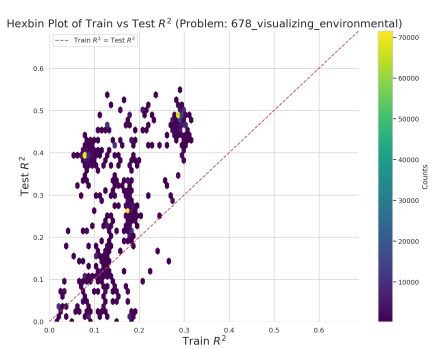
(g) 665_sleuth_case2002



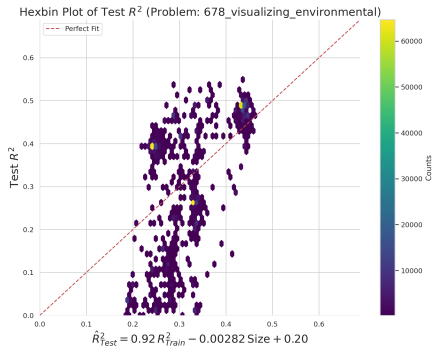
(h) LSLR with Expression Size



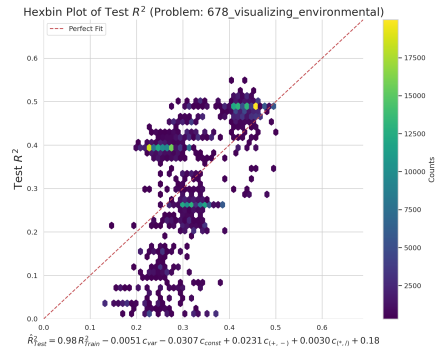
(i) LSLR with $c_{var}, c_{const}, c_{(+,-)}, c_{(/,*)}$



(j) 678_visualizing_environmental

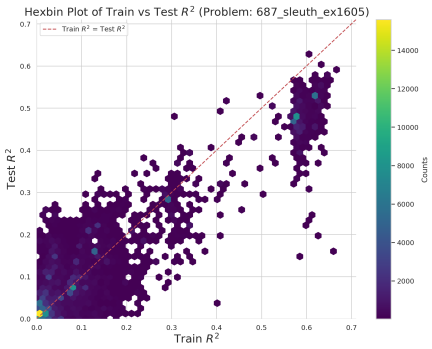


(k) LSLR with Expression Size

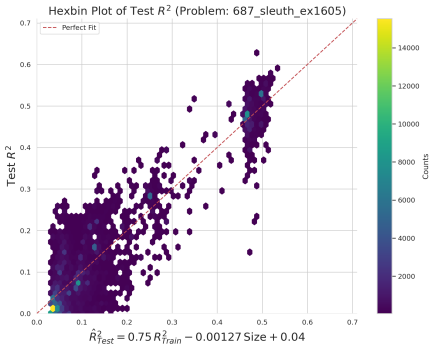


(l) LSLR with $c_{var}, c_{const}, c_{(+,-)}, c_{(/,*)}$

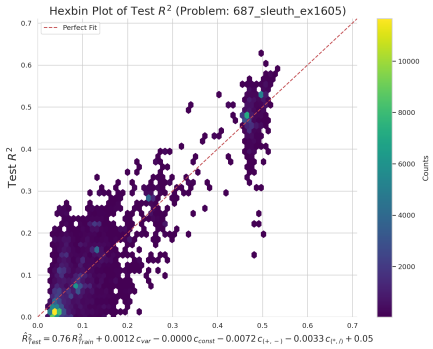
Figure 12: Problems from 628_fri_c3_1000_5 to 678_visualizing_environmental



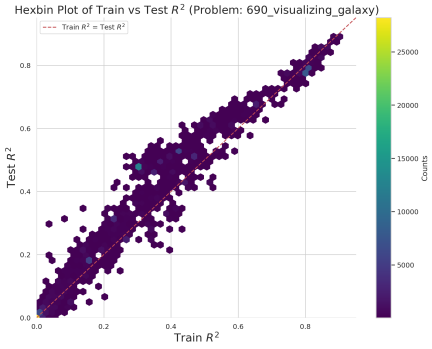
(a) 687_sleuth_ex1605



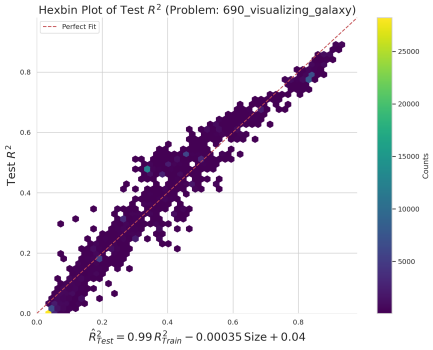
(b) LSLR with Expression Size



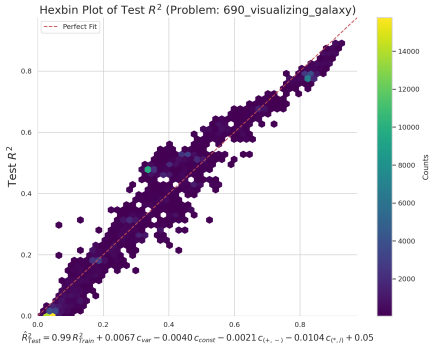
(c) LSLR with $c_{var}, c_{const}, c_{(+,-)}, c_{(/,*)}$



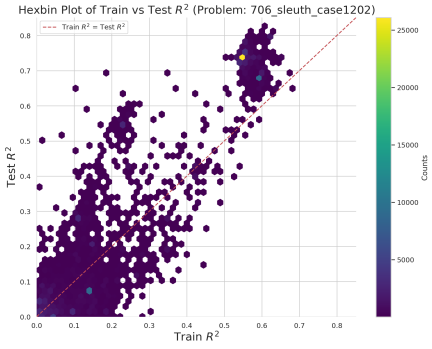
(d) 690_visualizing_galaxy



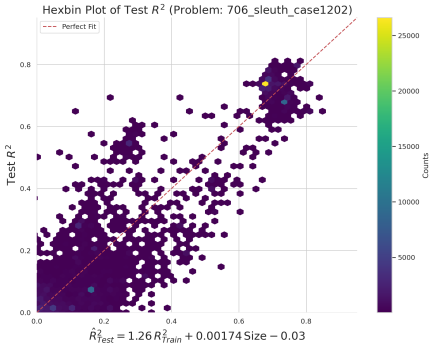
(e) LSLR with Expression Size



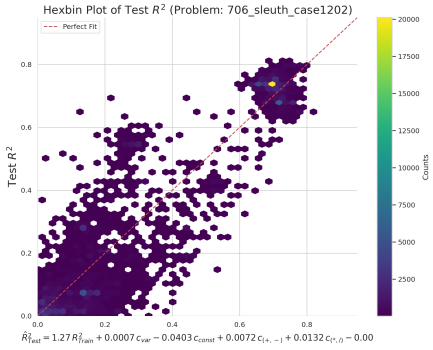
(f) LSLR with $c_{var}, c_{const}, c_{(+,-)}, c_{(/,*)}$



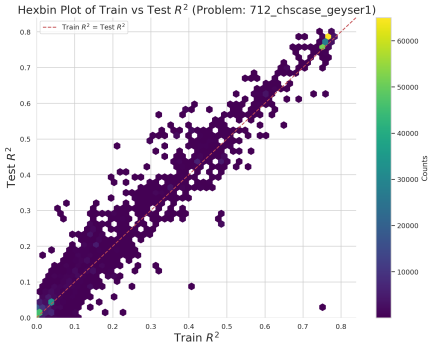
(g) 706_sleuth_case1202



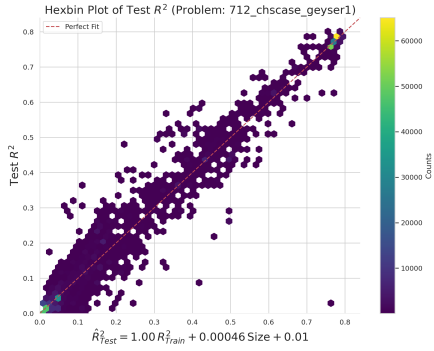
(h) LSLR with Expression Size



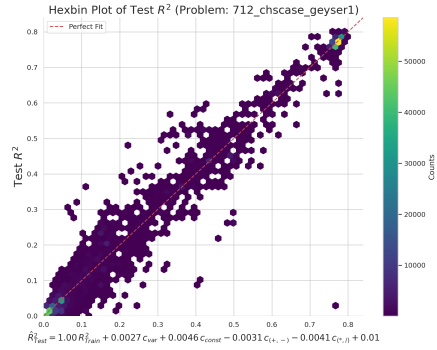
(i) LSLR with $c_{var}, c_{const}, c_{(+,-)}, c_{(/,*)}$



(j) 712_chscase_geyser1



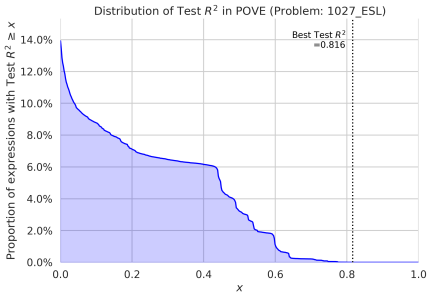
(k) LSLR with Expression Size



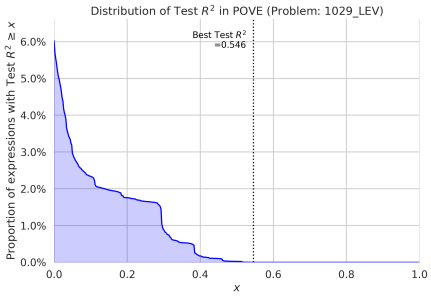
(l) LSLR with $c_{var}, c_{const}, c_{(+,-)}, c_{(/,*)}$

Figure 13: Problems from 687_sleuth_ex1605 to 712_chscase_geyser1

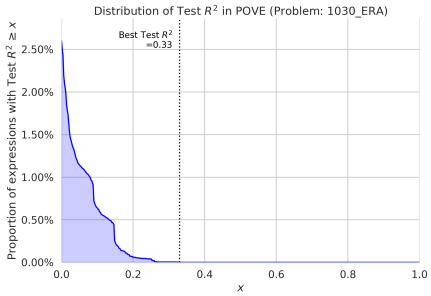
D All Distribution of Test R^2 Plots



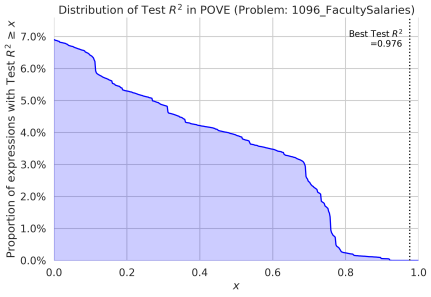
(a) 1027_ESL



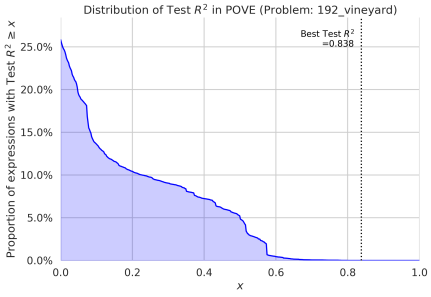
(b) 1029_LEV



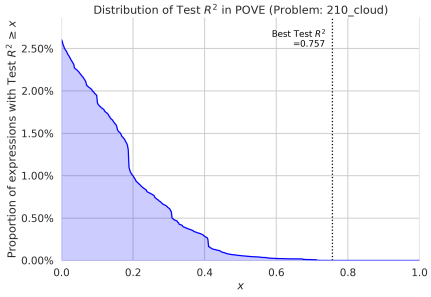
(c) 1030_ERA



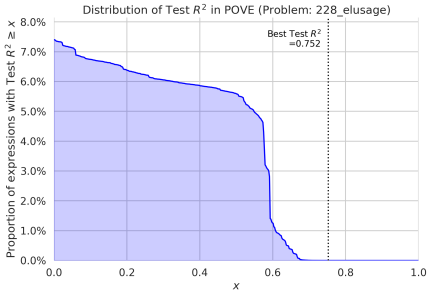
(d) 1096_FacultySalaries



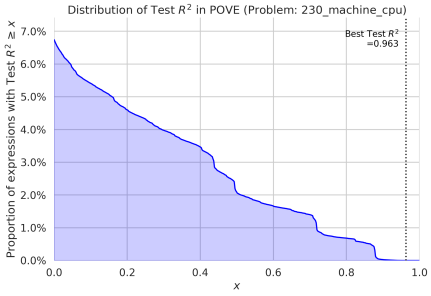
(e) 192_vineyard



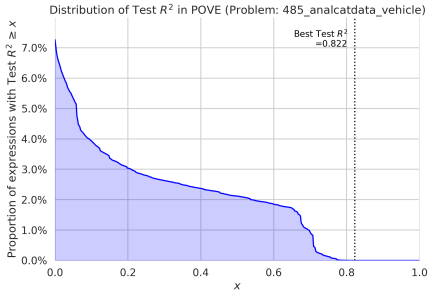
(f) 210_cloud



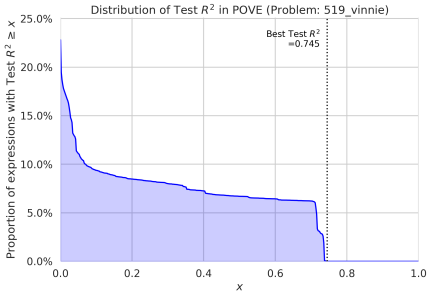
(g) 228_elusage



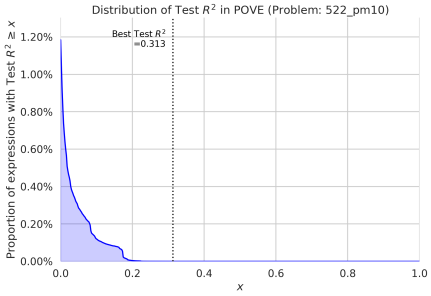
(h) 230_machine_cpu



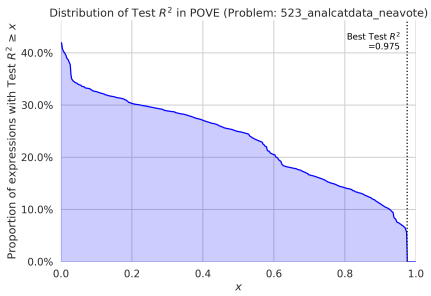
(i) 485_analcatdata_vehicle



(j) 519_vinnie

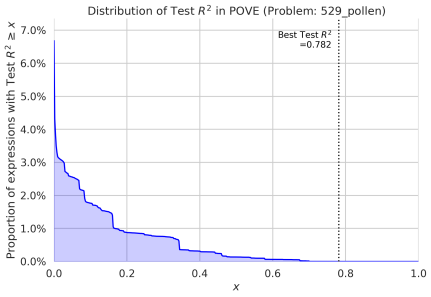


(k) 522_pm10

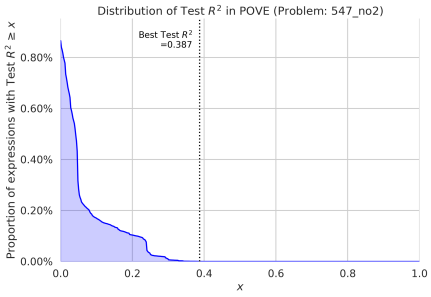


(l) 523_analcatdata_neavote

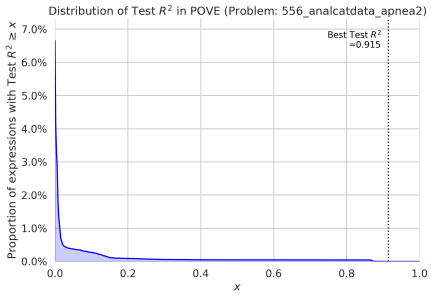
Figure 14: 1st to 12th problem



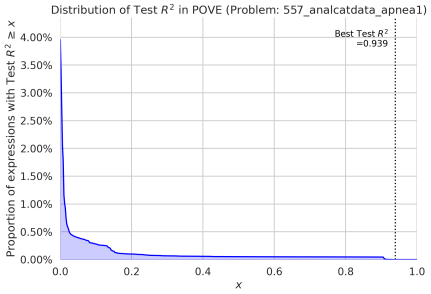
(a) 529_pollen



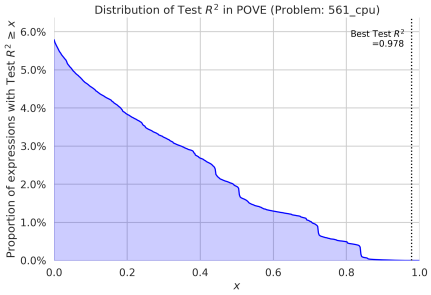
(b) 547_no2



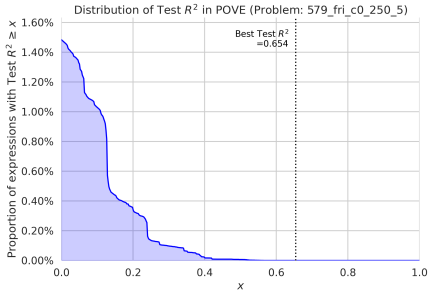
(c) 556_analcatdata_apnea2



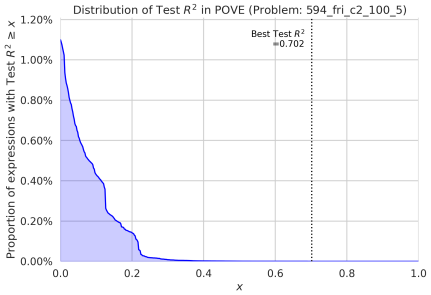
(d) 557_analcatdata_apnea1



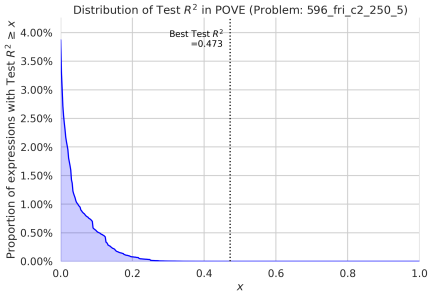
(e) 561_cpu



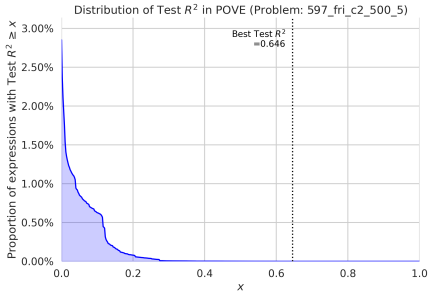
(f) 579_fri_c0_250_5



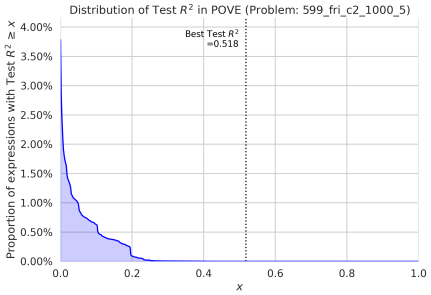
(g) 594_fri_c2_100_5



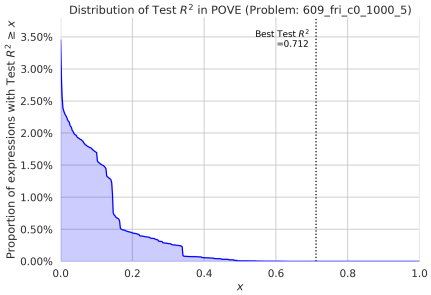
(h) 596_fri_c2_250_5



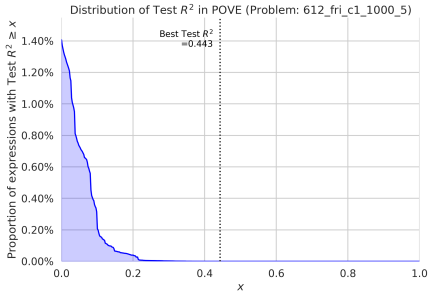
(i) 597_fri_c2_500_5



(j) 599_fri_c2_1000_5

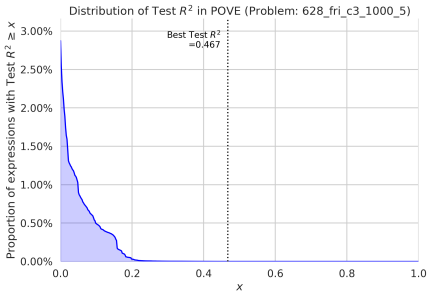


(k) 609_fri_c0_1000_5

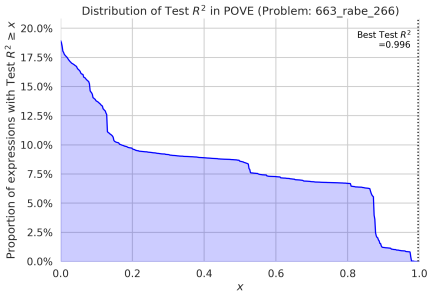


(l) 612_fri_c1_1000_5

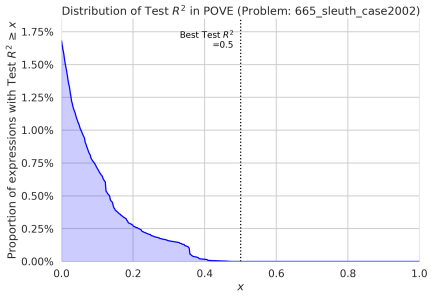
Figure 15: 13th to 24th problem



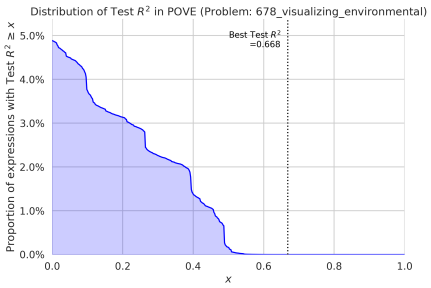
(a) 628_fri_c3_1000_5



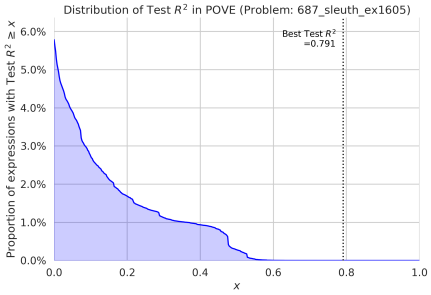
(b) 663_rabe_266



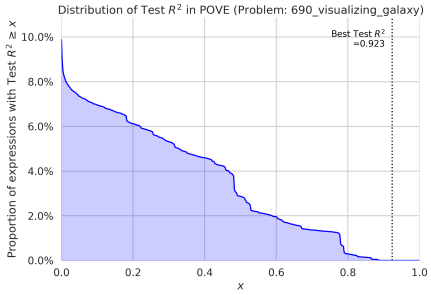
(c) 665_sleuth_case2002



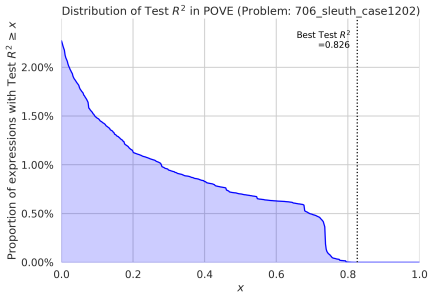
(d) 678_visualizing_environmental



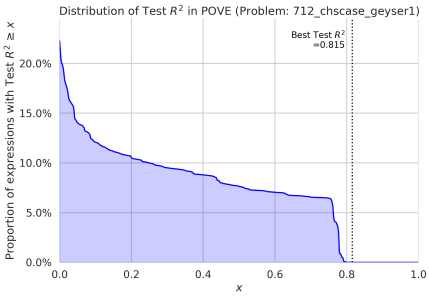
(e) 687_sleuth_ex1605



(f) 690_visualizing_galaxy



(g) 706_sleuth_case1202



(h) 712_chscase_geyser1

Figure 16: 25th to 32nd problem