Reading: GLM.Validation GLM_LRChart (Problem 1)
Model: Source Text
Problem Type: Investigate which rating plan performs best using a loss ratio chart.

Given A GLM is used to produce a new rating plan and its performance is measured using a holdout sample of 30 risks. Each risk represents a single exposure.

Risk	Current Premium	Actual Loss	Predicted Loss
1	1,374	709	794
2	1,754	1,443	1,558
3	158	169	147
4	1,080	520	577
5	3,371	1,599	1,775
6	1,366	1,326	1,313
7	1,178	1,008	907
8	1,575	748	695
9	2,974	1,391	1,391
10	160	163	141
11	1,083	572	492
12	3,691	1,950	1,794
13	1,005	975	1,004
14	1,183	1,131	961
15	691	598	520
16	2,175	1,937	1,782
17	1,782	1,781	1,781
18	1,738	1,430	1,530
19	1,435	1,352	1,284
20	2,298	1,892	2,175
21	2,880	1,463	1,638
22	1,594	774	696
23	1,677	1,651	1,866
24	877	826	925
25	118	117	103
26	2,915	1,554	1,460
27	211	182	189
28	1,458	1,554	1,647
29	392	345	351
30	1,663	813	837

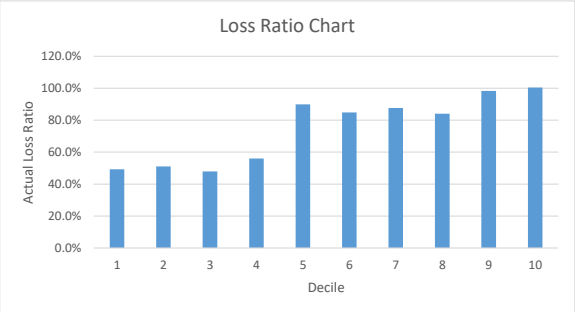
Find Use a loss ratio chart with deciles to demonstrate whether the new plan represents an improvement over the current plan.

Solution

First compute the predicted loss ratio as Predicted Loss / Current Premium.
Then order the resulting table by increasing predicted loss ratio

Risk	Current Premium	Actual Loss	Predicted Loss Ratio	Quantile
22	1,594	774	43.7%	1
8	1,575	748	44.1%	1
11	1,083	572	45.4%	1
9	2,974	1,391	46.8%	2
12	3,691	1,950	48.6%	2
26	2,915	1,554	50.1%	2
30	1,663	813	50.3%	3
5	3,371	1,599	52.7%	3
4	1,080	520	53.4%	3
21	2,880	1,463	56.9%	4
1	1,374	709	57.8%	4
15	691	598	75.3%	4
7	1,178	1,008	77.0%	5
14	1,183	1,131	81.2%	5
16	2,175	1,937	81.9%	5
25	118	117	87.3%	6
18	1,738	1,430	88.0%	6
10	160	163	88.1%	6
2	1,754	1,443	88.8%	7
19	1,435	1,352	89.5%	7
29	392	345	89.5%	7
27	211	182	89.6%	8
3	158	169	93.0%	8
20	2,298	1,892	94.6%	8
6	1,366	1,326	96.1%	9
13	1,005	975	99.9%	9
17	1,782	1,781	99.9%	9
24	877	826	105.5%	10
23	1,677	1,651	111.3%	10
28	1,458	1,554	113.0%	10

Quantile	Actual Loss	Current Premium	Actual Loss Ratio
1	2,094	4,252	49.2%
2	4,895	9,580	51.1%
3	2,932	6,114	48.0%
4	2,770	4,945	56.0%
5	4,076	4,536	89.9%
6	1,710	2,016	84.8%
7	3,140	3,581	87.7%
8	2,243	2,667	84.1%
9	4,082	4,153	98.3%
10	4,031	4,012	100.5%



As we view the deciles from left to right the loss ratios are generally increasing which means the proposed model performs better than the current model.

Reading: GLM.Validation GLM_LRChart (Problem 2)
Model: Source Text
Problem Type: Investigate which rating plan performs best using a loss ratio chart.

Given A GLM is used to produce a new rating plan and its performance is measured using a holdout sample of 30 risks. Each risk represents a single exposure.

Risk	Current Premium	Actual Loss	Predicted Loss
1	696	709	1,594
2	695	1,443	1,575
3	492	169	1,083
4	1,391	520	2,974
5	1,794	1,599	3,691
6	1,460	1,326	2,915
7	837	1,008	1,663
8	1,775	748	3,371
9	577	1,391	1,080
10	1,638	163	2,880
11	794	572	1,374
12	520	1,950	691
13	907	975	1,178
14	961	1,131	1,183
15	1,782	598	2,175
16	103	1,937	118
17	1,530	1,781	1,738
18	141	1,430	160
19	1,558	1,352	1,754
20	1,284	1,892	1,435
21	351	1,463	392
22	189	774	211
23	147	1,651	158
24	2,175	826	2,298
25	1,313	117	1,366
26	1,004	1,554	1,005
27	1,781	182	1,782
28	925	1,554	877
29	1,866	345	1,677
30	1,647	813	1,458

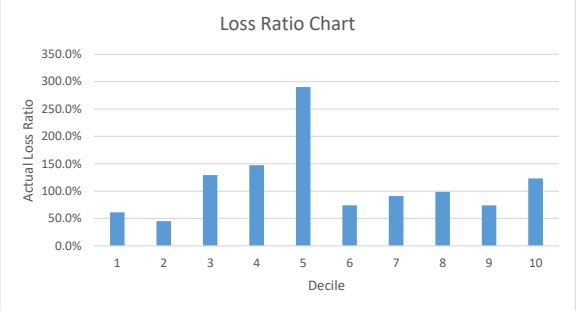
Find Use a loss ratio chart with deciles to demonstrate whether the new plan represents an improvement over the current plan.

Solution

First compute the predicted loss ratio as Predicted Loss / Current Premium.
Then order the resulting table by increasing predicted loss ratio

Risk	Current Premium	Actual Loss	Predicted Loss Ratio	Quantile
30	1,647	813	88.5%	1
29	1,866	345	89.9%	1
28	925	1,554	94.8%	1
27	1,781	182	100.1%	2
26	1,004	1,554	100.1%	2
25	1,313	117	104.0%	2
24	2,175	826	105.7%	3
23	147	1,651	107.5%	3
22	189	774	111.6%	3
21	351	1,463	111.7%	4
20	1,284	1,892	111.8%	4
19	1,558	1,352	112.6%	4
18	141	1,430	113.5%	5
17	1,530	1,781	113.6%	5
16	103	1,937	114.6%	5
15	1,782	598	122.1%	6
14	961	1,131	123.1%	6
13	907	975	129.9%	6
12	520	1,950	132.9%	7
11	794	572	173.0%	7
10	1,638	163	175.8%	7
9	577	1,391	187.2%	8
8	1,775	748	189.9%	8
7	837	1,008	198.7%	8
6	1,460	1,326	199.7%	9
5	1,794	1,599	205.7%	9
4	1,391	520	213.8%	9
3	492	169	220.1%	10
2	695	1,443	226.6%	10
1	696	709	229.0%	10

Quantile	Actual Loss	Current Premium	Actual Loss Ratio
1	2,712	4,438	61.1%
2	1,853	4,098	45.2%
3	3,251	2,511	129.5%
4	4,707	3,193	147.4%
5	5,148	1,774	290.2%
6	2,704	3,650	74.1%
7	2,685	2,952	91.0%
8	3,147	3,189	98.7%
9	3,445	4,645	74.2%
10	2,321	1,883	123.3%



The loss ratios are volatile due to the small number of risks used to assess the models. However, there is no clear pattern across all deciles so we conclude the proposed model is not a material improvement over the current model.