Table 3. Overall results across 16 methods for the online pipeline

Variant	ROC AUC (↑)	Log Loss (↓)	Accuracy (↑)	Precision (↑)	Recall (↑)	SPD (∼0)	EOD (∼0)	Rank Perf (↓)	Rank Fair (↓)
rep=0.5 | lbl=0.0									
none	**0.912**	**0.424**	**0.795**	0.688	**0.909**	-0.386	-0.138	**1**	5
reweight_auto	0.886	0.432	0.775	0.684	0.829	-0.311	-0.125	3	4
reweight_manual_A0.5_B1.5	0.909	0.427	0.791	**0.693**	0.870	-0.329	-0.070	2	3
mitigator_demographic_parity	0.546	0.719	0.578	0.476	0.363	**-0.033**	0.040	5	**1**
mitigator_equalized_odds	0.639	0.654	0.617	0.529	0.537	-0.133	**-0.017**	4	2
rep=0.5 | lbl=0.4									
none	**0.922**	0.381	**0.809**	**0.705**	0.876	-0.490	-0.262	**1**	5
reweight_auto	0.896	**0.365**	0.766	0.637	**0.926**	-0.507	-0.173	2	4
reweight_manual_A0.5_B1.5	0.907	0.457	0.790	0.687	0.849	-0.461	-0.193	3	3
mitigator_demographic_parity	0.549	0.745	0.594	0.461	0.254	**-0.023**	0.108	5	**1**
mitigator_equalized_odds	0.701	0.626	0.644	0.537	0.616	-0.234	**-0.049**	4	2
rep=0.5 | lbl=0.5									
none	**0.892**	**0.374**	**0.765**	**0.666**	0.830	-0.503	-0.198	**1**	5
reweight_auto	0.884	0.377	0.756	0.652	**0.837**	-0.426	-0.083	2	3
reweight_manual_A0.5_B1.5	0.884	0.489	0.763	0.665	0.825	-0.438	-0.187	3	4
mitigator_demographic_parity	0.518	0.764	0.549	0.426	0.361	**0.006**	0.078	5	**1**
mitigator_equalized_odds	0.673	0.655	0.618	0.518	0.700	-0.211	**-0.033**	4	2
rep=0.5 | lbl=0.6									
none	0.883	0.452	0.773	0.675	0.807	-0.470	-0.409	3	4
reweight_auto	**0.905**	0.471	**0.792**	**0.684**	0.867	-0.492	-0.394	2	5
reweight_manual_A0.5_B1.5	0.892	**0.426**	0.781	0.664	**0.892**	-0.514	-0.363	**1**	3
mitigator_demographic_parity	0.519	0.780	0.581	0.424	0.206	**-0.011**	**0.021**	5	**1**
mitigator_equalized_odds	0.646	0.671	0.604	0.495	0.684	-0.220	-0.159	4	2
rep=0.6 | lbl=0.0									
none	0.885	0.458	0.769	0.690	0.850	-0.332	-0.138	3	5
reweight_auto	0.888	**0.394**	0.781	0.700	0.864	-0.237	**0.031**	**1**	3
reweight_manual_A0.5_B1.5	**0.898**	0.461	**0.788**	**0.706**	**0.877**	-0.310	-0.054	2	4
mitigator_demographic_parity	0.622	0.667	0.599	0.552	0.388	**-0.082**	-0.036	5	**1**
mitigator_equalized_odds	0.691	0.627	0.631	0.582	0.531	-0.184	-0.068	4	2
rep=0.6 | lbl=0.4									
none	**0.897**	0.439	0.785	**0.723**	0.883	-0.476	-0.231	2	5
reweight_auto	0.881	**0.397**	0.765	0.701	0.876	-0.483	-0.122	3	3
reweight_manual_A0.5_B1.5	0.896	0.434	**0.790**	0.720	**0.909**	-0.486	-0.205	**1**	4
mitigator_demographic_parity	0.590	0.704	0.561	0.525	0.737	**-0.112**	**0.008**	5	**1**
mitigator_equalized_odds	0.685	0.644	0.627	0.581	0.746	-0.240	-0.049	4	2
rep=0.6 | lbl=0.5									
none	0.896	0.443	0.786	0.712	0.892	-0.453	-0.264	2	4
reweight_auto	0.883	0.454	0.772	0.690	0.905	-0.420	-0.210	3	3
reweight_manual_A0.5_B1.5	**0.904**	**0.434**	**0.794**	**0.712**	**0.918**	-0.479	-0.257	**1**	5
mitigator_demographic_parity	0.570	0.729	0.535	0.490	0.549	**-0.054**	**0.026**	5	**1**
mitigator_equalized_odds	0.661	0.670	0.604	0.547	0.758	-0.221	-0.098	4	2
rep=0.6 | lbl=0.6									
none	0.893	0.453	**0.792**	**0.729**	0.892	-0.508	-0.408	**1**	5
reweight_auto	0.874	0.464	0.764	0.711	0.844	-0.417	-0.405	3	3
reweight_manual_A0.5_B1.5	**0.896**	**0.436**	0.781	0.714	**0.894**	-0.465	-0.401	2	4
mitigator_demographic_parity	0.603	0.707	0.562	0.527	0.702	**-0.105**	0.012	5	**1**
mitigator_equalized_odds	0.689	0.655	0.618	0.567	0.815	-0.224	**-0.002**	4	2
rep=0.7 | lbl=0.0									
none	0.897	0.446	0.791	0.727	0.907	-0.339	-0.140	3	5
reweight_auto	0.897	**0.417**	**0.800**	**0.747**	0.885	-0.283	-0.102	2	3
reweight_manual_A0.5_B1.5	**0.904**	0.421	0.800	0.738	**0.907**	-0.346	-0.120	**1**	4
mitigator_demographic_parity	0.663	0.655	0.608	0.589	0.613	**-0.115**	0.052	5	**1**
mitigator_equalized_odds	0.673	0.649	0.633	0.594	0.748	-0.204	**-0.037**	4	2
rep=0.7 | lbl=0.4									
none	0.871	0.460	0.777	**0.767**	0.826	-0.440	-0.283	3	5
reweight_auto	0.889	**0.393**	**0.790**	0.755	0.888	-0.538	-0.130	**1**	4
reweight_manual_A0.5_B1.5	**0.889**	0.465	0.790	0.738	**0.928**	-0.431	-0.192	2	3
mitigator_demographic_parity	0.630	0.674	0.601	0.594	0.763	**-0.134**	0.036	5	**1**
mitigator_equalized_odds	0.660	0.661	0.609	0.591	0.825	-0.206	**-0.015**	4	2
rep=0.7 | lbl=0.5									
none	**0.884**	0.475	**0.793**	**0.760**	0.891	-0.468	-0.357	3	5
reweight_auto	0.872	**0.414**	0.773	0.726	**0.919**	-0.406	-0.165	**1**	3
reweight_manual_A0.5_B1.5	0.880	0.443	0.783	0.751	0.885	-0.413	-0.312	2	4
mitigator_demographic_parity	0.623	0.682	0.586	0.577	0.822	**-0.100**	**0.022**	5	**1**
mitigator_equalized_odds	0.670	0.658	0.621	0.594	0.903	-0.197	-0.043	4	2
rep=0.7 | lbl=0.6									
none	**0.907**	0.433	**0.817**	**0.780**	0.917	-0.503	-0.414	**1**	5
reweight_auto	0.900	0.421	0.809	0.778	0.901	-0.454	-0.269	3	3
reweight_manual_A0.5_B1.5	0.903	**0.420**	0.811	0.769	**0.925**	-0.471	-0.305	2	4
mitigator_demographic_parity	0.628	0.680	0.606	0.595	0.827	**-0.152**	-0.077	5	**1**
mitigator_equalized_odds	0.678	0.656	0.635	0.607	0.905	-0.225	**-0.051**	4	2
rep=0.8 | lbl=0.0									
none	0.895	0.451	0.804	**0.762**	0.907	-0.364	-0.151	2	5
reweight_auto	**0.907**	**0.401**	**0.813**	0.759	**0.937**	-0.332	-0.070	**1**	3
reweight_manual_A0.5_B1.5	0.881	0.432	0.780	0.730	0.916	-0.333	-0.081	3	4
mitigator_demographic_parity	0.672	0.648	0.624	0.625	0.693	**-0.142**	0.037	5	**1**
mitigator_equalized_odds	0.680	0.646	0.630	0.619	0.752	-0.184	**-0.027**	4	2
rep=0.8 | lbl=0.4									
none	**0.913**	**0.421**	**0.829**	**0.809**	0.929	-0.513	-0.332	**1**	5
reweight_auto	0.899	0.481	0.812	0.807	0.892	-0.455	-0.259	3	3
reweight_manual_A0.5_B1.5	0.908	0.446	0.827	0.800	0.939	-0.544	-0.282	2	4
mitigator_demographic_parity	0.669	0.633	0.660	0.655	0.891	**-0.177**	0.041	5	**1**
mitigator_equalized_odds	0.689	0.629	0.675	0.653	**0.948**	-0.249	**0.030**	4	2
rep=0.8 | lbl=0.5									
none	0.884	0.479	0.800	0.769	**0.942**	-0.459	-0.272	2	3
reweight_auto	0.874	**0.404**	0.788	0.777	0.896	-0.402	-0.391	**1**	4
reweight_manual_A0.5_B1.5	**0.896**	0.531	**0.813**	**0.792**	0.924	-0.491	-0.378	3	5
mitigator_demographic_parity	0.668	0.632	0.653	0.658	0.847	**-0.220**	-0.135	5	**1**
mitigator_equalized_odds	0.691	0.624	0.668	0.661	0.890	-0.244	**-0.116**	4	2
rep=0.8 | lbl=0.6									
none	0.879	0.450	0.813	0.804	0.916	-0.513	-0.395	2	5
reweight_auto	**0.901**	**0.420**	**0.825**	**0.817**	0.920	-0.498	-0.398	**1**	4
reweight_manual_A0.5_B1.5	0.867	0.445	0.799	0.782	0.931	-0.452	-0.317	3	3
mitigator_demographic_parity	0.632	0.647	0.670	0.660	0.948	**-0.160**	-0.058	5	2
mitigator_equalized_odds	0.668	0.633	0.671	0.658	**0.958**	-0.179	**-0.032**	4	**1**