Tythorradiney rarredons			supy ter notebooks	
Data representing Data splitting Data sampling Data transforming	SVD SAR RLRMC NCF FM/FFM Wide&Deep xDeepFM DKN LightGBM	Ranking metrics Rating metrics Bitwise metrics	 Real-time recommendation with batch-mode model building pipeline Real-time recommendation generation for personalization Knowledge graph based recommendation 	
Data preprocessing	Model selection	Model evaluating	Data preservation	Model / results deployment
CI/CD build pipeline				
CPU	Spark	GPU	Globally distributed	Kubernetes cluster
Docker container Vii		/irtual machine	database	Rubemetes cluster