

DAFTAR ISI

Halaman Judul	ii
Halaman Pengesahan	iii
Halaman Pernyataan	iv
Halaman Persembahan	v
PRAKATA	vi
DAFTAR ISI	vii
DAFTAR TABEL	x
DAFTAR GAMBAR	xii
INTISARI	xv
ABSTRACT	xvi
I PENDAHULUAN	1
1.1 Latar Belakang	1
1.2 Rumusan Masalah	2
1.3 Batasan Masalah	2
1.4 Tujuan Penelitian	3
1.5 Manfaat Penelitian	3
1.6 Tahapan Penelitian	3
1.7 Sistematika Penulisan	4
II TINJAUAN PUSTAKA	6
III LANDASAN TEORI	12
3.1 Sistem Rekomendasi	12
3.2 <i>Feedback</i>	13
3.3 <i>Collaborative Filtering</i>	13
3.3.1 <i>Matrix Factorization</i>	14

3.3.2	<i>Bayesian Personalized Ranking</i>	15
3.3.3	<i>Collaborative Less is More Filtering</i>	18
3.4	<i>Content-based Filtering</i>	21
3.4.1	Pra-pemrosesan kalimat	22
3.4.2	<i>Term Frequency-Inverse Document Frequency (TF-IDF)</i>	23
3.4.3	Perhitungan <i>similarity</i>	24
3.5	Sistem rekomendasi <i>hybrid</i>	24
3.6	Metrik	25
3.6.1	<i>Mean Reciprocal Ranking (MRR)</i>	25
3.6.2	<i>Normal Discounted Cumulative Gain (NDCG)</i>	26
3.6.3	<i>Area Under the ROC Curve (AUC)</i>	26
IV	ANALISIS DAN PERANCANGAN SISTEM	29
4.1	Analisis Sistem	29
4.1.1	Deskripsi umum	29
4.1.2	Analisis Permasalahan	29
4.2	Dataset	29
4.2.1	Canvas Network	29
4.2.2	MOOC Cube	30
4.3	Perancangan sistem	32
4.3.1	Pra-pemrosesan Data	32
4.3.2	<i>Modeling</i>	36
4.4	Evaluasi	44
4.4.1	<i>Mean Reciprocal Ranking (MRR)</i>	44
4.4.2	<i>Normal Discounted Cumulative Gain (NDCG)</i>	45
4.4.3	<i>Area Under the ROC Curve (AUC)</i>	47
V	IMPLEMENTASI SISTEM	49
5.1	Spesifikasi perangkat	49
5.2	Implementasi Kode	49
5.3	Implementasi Pra-pemrosesan Data	50
5.3.1	Canvas Network	50
5.3.2	MOOC Cube	53
5.4	Implementasi Algoritma <i>Collaborative Filtering</i>	61
5.4.1	<i>Bayesian Personalized Ranking (BPR)</i>	63
5.4.2	<i>Collaborative Less is More Filtering (CLiMF)</i>	70

5.5	Implementasi Evaluasi	76
5.5.1	<i>Mean Reciprocal Rank (MRR)</i>	77
5.5.2	<i>Normalized Discounted Cumulative Gain (NDCG)</i>	78
5.5.3	<i>Area Under the ROC Curve (AUC)</i>	79
VI	HASIL DAN PEMBAHASAN	81
6.1	Pendahuluan	81
6.2	Sampel Hasil Rekomendasi	85
6.3	Hasil Pengujian Menggunakan BPR	87
6.4	Hasil Pengujian Menggunakan CLiMF	89
6.5	Perbandingan BPR dan CLiMF	91
6.6	Pengaruh <i>Content-based Filtering</i>	92
VII	KESIMPULAN DAN SARAN	94
7.1	Kesimpulan	94
7.2	Saran	94
	DAFTAR PUSTAKA	95