

BAB 4

IMPLEMENTASI DAN PENGUJIAN

4.1. Implementasi

Tahap implementasi merupakan tahap setelah analisis dan perancangan sistem, hasil analisis akan di implementasikan ke dalam program agar selanjutnya bisa dilakukan pengujian. Bahasa pemrograman yang digunakan adalah *Python*.

4.1.1. Implementasi Hardware

Spesifikasi *hardware* yang digunakan pada implementasi dan pengujian dalam penelitian ini dapat dilihat pada tabel 4.1 *Hardware yang Digunakan*.

Tabel 4.1 Hardware yang Digunakan

<i>Hardware</i>	<i>Spesifikasi</i>
<i>Processor</i>	Core i3 7020U (2.3GHz, 3MB L3 Cache)
<i>RAM</i>	4 GB
<i>Harddisk</i>	1 TB
<i>Monitor</i>	(1366 x 768)
<i>Keyboard & Mouse</i>	<i>Standard</i>

4.1.2. Implementasi Software

Spesifikasi *software* yang digunakan pada implementasi dan pengujian dalam penelitian ini dapat dilihat pada tabel 4.2 *Software yang Digunakan*.

Tabel 4.2 Software yang Digunakan

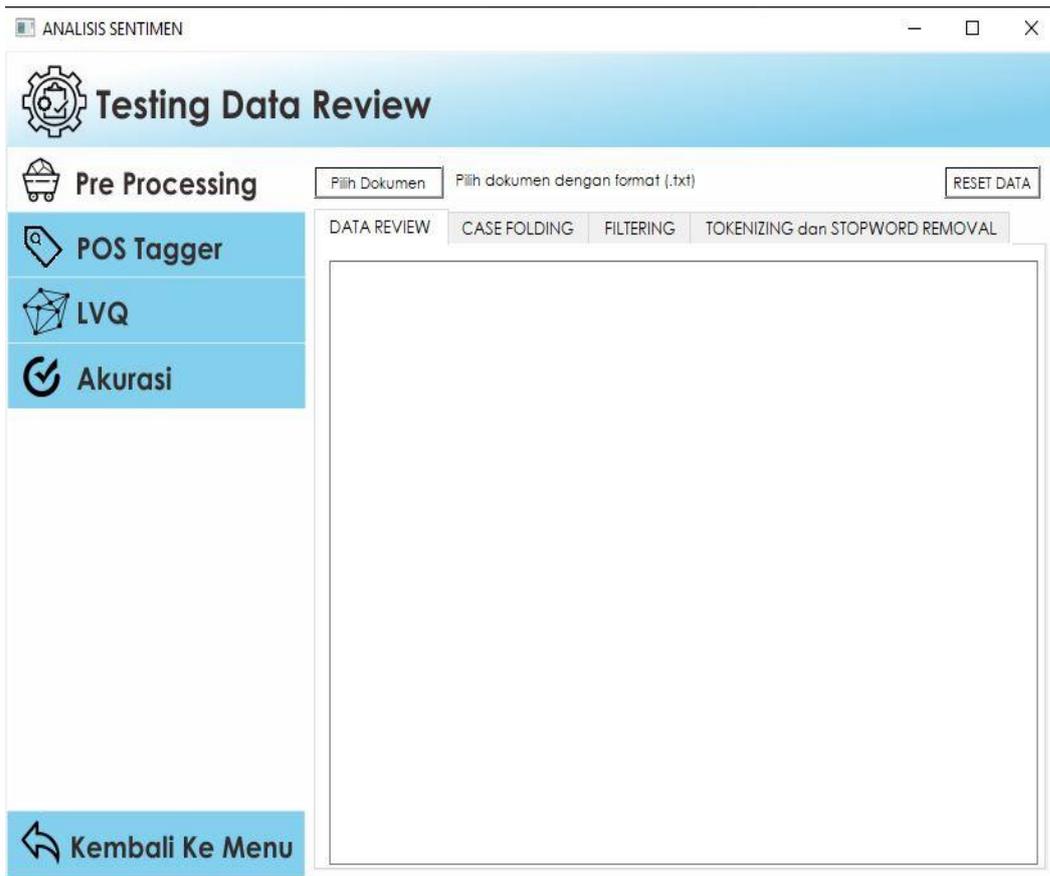
<i>Software</i>	<i>Spesifikasi</i>
<i>Operating System</i>	<i>Microsoft Windows 10</i>
<i>Development Kit</i>	Python 3.7.2 Spyder

4.1.3. Implementasi Antarmuka

Implementasi antarmuka sistem dibuat berdasarkan perancangan antarmuka pada bab 3. Pada perangkat lunak sistem Analisis sentiment Knowledge Pattern dan Learning Vector Quantization terdapat lima implementasi antarmuka, yaitu:

4.1.3.1. Implementasi Antarmuka Halaman Menu

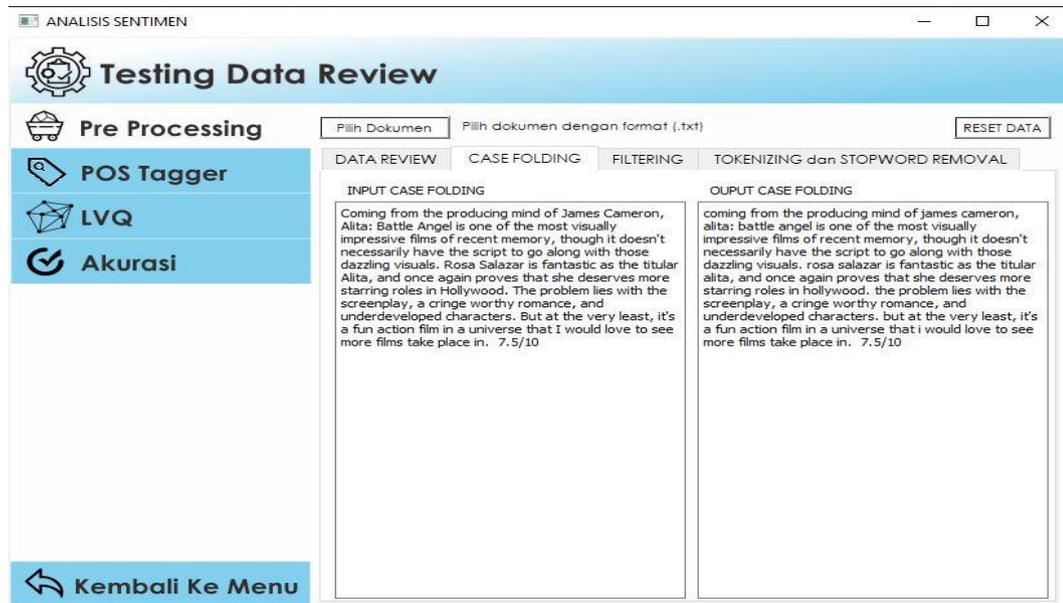
Antarmuka halaman menu adalah tampilan awal pada saat membuka perangkat lunak. Pada implementasi antarmuka ini terdapat halaman nama sistem dan beberapa menu dalam tahapan preprocessing. Seperti pada Gambar 4.1 dibawah.



Gambar 4.1 Halaman Menu

4.1.3.2. Implementasi Antarmuka Halaman Praprosesing

Antarmuka halaman preprocessing adalah tampilan pada saat data di masukan kedalam sistem dan melakukan proses beberapa tahapan yang ada dalam preprocessing. Seperti tampak pada Gambar 4.2 dibawah.



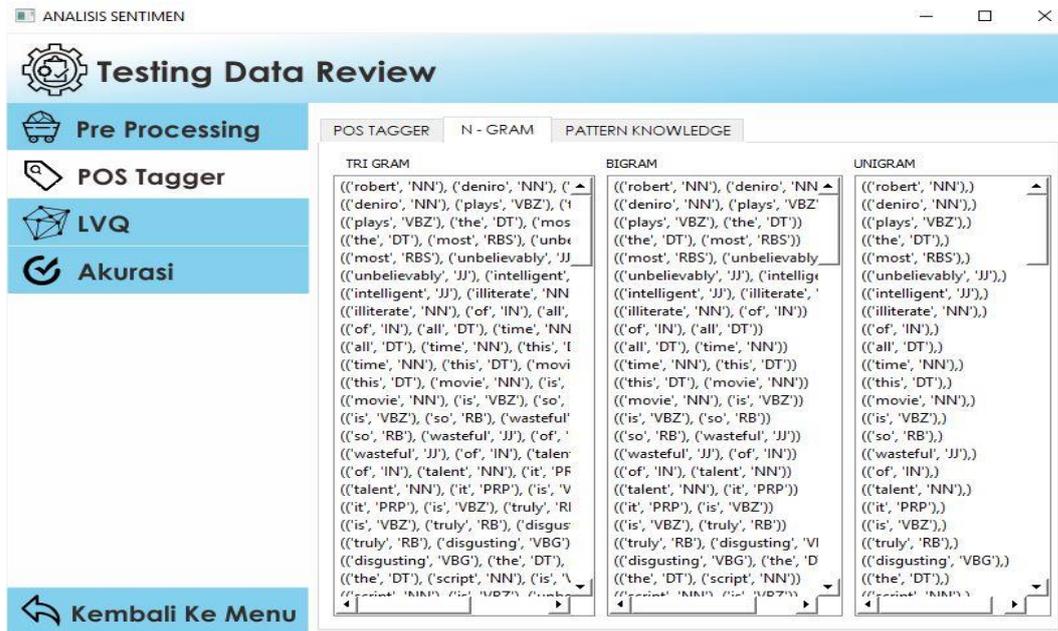
Gambar 4.2 Implementasi Antarmuka Halaman Proses Case Folding

4.1.3.2. Implementasi Antarmuka Halaman Pattern Knowledge

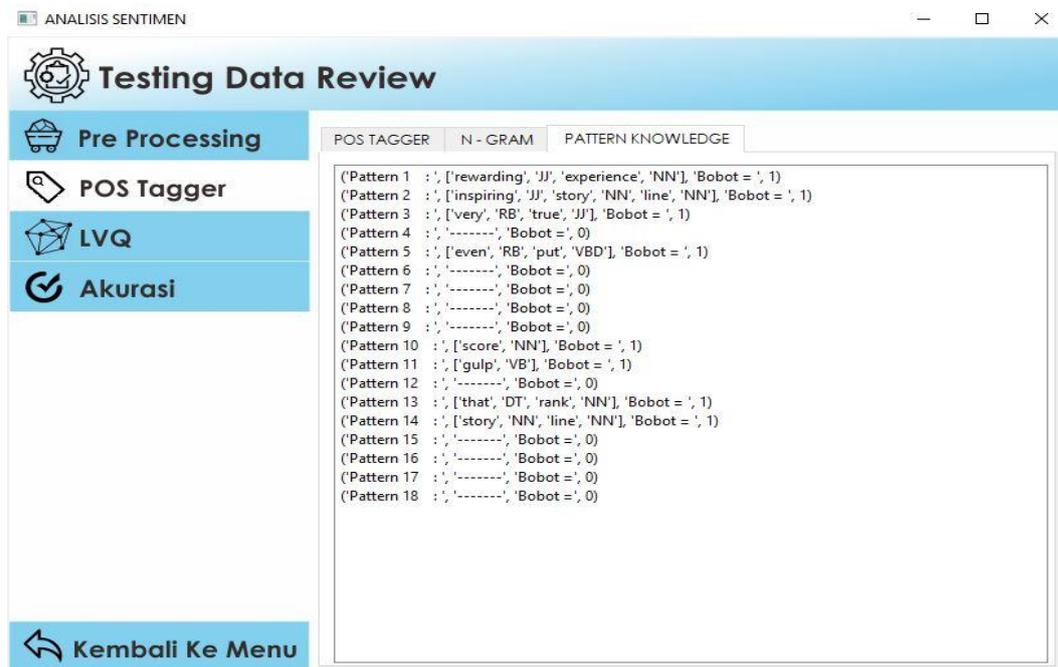
Antarmuka halaman *Pattern Knowledge* adalah tampilan pada saat data di masukan kedalam sistem dan melakukan proses perhitungan pemilihan fitur yang dilakukan dengan metode *Pattern Knowledge* dan melalui beberapa tahapan. Seperti tampak pada Gambar 4.3, Gambar 4.4, dan Gambar 4.5 dibawah.



Gambar 4.3 Antarmuka Proses Pos Tag Pada Pattern Knowledge



Gambar 4.4 Antarmuka Proses N-grams Pada Pattern Knowledge



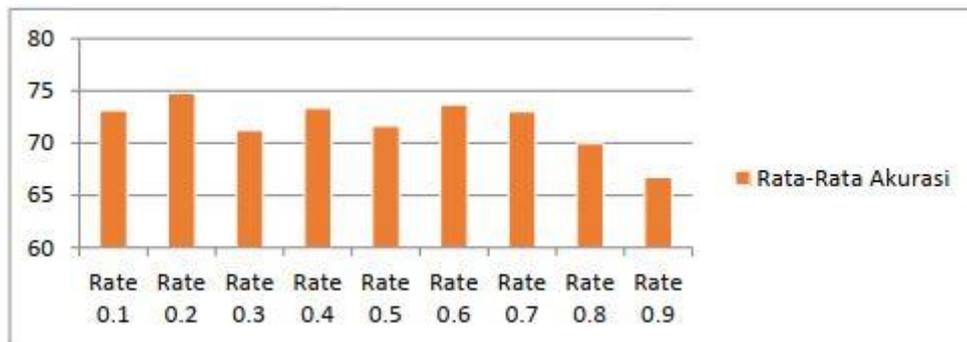
Gambar 4.5 Antarmuka Hasil Pattern Knowledge

4.2. Pengujian Hasil Klasifikasi

Pengujian performansi dilakukan dengan menguji perubahan yang terjadi apabila nilai learning rate dan jumlah iterasi berubah. Nilai learning rate sebuah

parameter yang umum dalam proses belajar algoritma jaringan syaraf tiruan yang mempengaruhi kecepatan dimana JST tiba disolusi minimum. Sedangkan jumlah iterasi (epoch) adalah jumlah perulangan pelatihan yang dilakukan dalam suatu jangka waktu sehingga tingkat kesalahan menjadi nol.

Berdasarkan dari perhitungan sebelumnya Hasil uji coba klasifikasi metode LVQ pada 100 data training dengan learning rate 0,1 dan maxEpoch = 500 didapat hasil.



Gambar 4.6 Gambar Hasil Akurasi 100 data Dengan Learning Rate

Dengan menguji learning rate dan menggunakan jumlah iterasi sebanyak 500 kali didapatkan hasil seperti diatas. Dari hasil pengujian di atas didapatkan akurasi tertinggi pada saat *learning rate* 0.2 dengan nilai akurasi sebesar 74.8%, sedangkan akurasi terendah didapatkan pada saat *learning rate* 0.9 dengan nilai akurasi sebesar 66.75%.

Setelah mendapatkan hasil dari pelatihan sebelumnya maka hasil klasifikasi tersebut akan di uji dengan menggunakan untuk mendapatkan nilai akurasi dari metode *Learning Vector Quantization*. Hasil dari klasifikasi yaitu pada tabel 4.3 dibawah.

Tabel 4. 3 Hasil Klasifikasi LVQ

No	Review	Jarak ke Bobot Positif	Jarak ke Bobot Negatif	Hasil
1	Robert DeNiro plays the most unbelievably intelligent illiterate of all time. This movie is so wasteful of talent, it is truly	2.5821	2.4316	Negatif

	<p>disgusting. The script is unbelievable. The dialog is unbelievable. Jane Fonda's character is a caricature of herself, and not a funny one. The movie moves at a snail's pace, is photographed in an ill-advised manner, and is insufferably preachy. It also plugs in every cliché in the book. Swoozie Kurtz is excellent in a supporting role, but so what? Equally annoying is this new IMDB rule of requiring ten lines for every review. When a movie is this worthless, it doesn't require ten lines of text to let other readers know that it is a waste of time and tape. Avoid this movie.</p>			
2	<p>I saw the capsule comment said "great acting." In my opinion, these are two great actors giving horrible performances, and with zero chemistry with one another, for a great director in his all-time worst effort. Robert De Niro has to be the most ingenious and insightful illiterate of all time. Jane Fonda's performance uncomfortably drifts all over the map as she clearly has no handle on this character, mostly because the character is so poorly written. Molasses-like would be too swift an adjective for this film's excruciating pacing. Although the film's intent is to be an uplifting story of curing illiteracy, watching it is a true "bummer." I give it 1 out of 10, truly one of the worst 20 movies for its budget level that I have ever seen.</p>	2.9136	1.7064	Negatif
3	<p>This film has a special place in my heart, as when I caught it the first time, I was teaching adult literacy. It rang very true to me and even an outstanding student I had at the time. There are scenes which make you</p>	2.3046	2.6367	Positif

	<p>gulp with sudden emotion, and those which even put a smile on your face through sheer identification with the characters and their situation. Excellent performances by Jane Fonda and Robert DeNiro that rank with their best work, a great turn by a young Martha Plimpton, an inspiring story line, and a haunting musical score makes for a most enjoyable and rewarding experience.</p>			
4	<p>This movie was terrible. at first i just read the plot summary and it looked OK, so i watched it. The acting was TERRIBLE. it was like the actor were almost camera shy. everything seemed fake. i feel bad for Edward Furlong, terminator 2 was my favorite a few years ago.. I've watched it at least 20 times.... the plot was also crap. the writers were probably sleep deprived when they came up with the lines. on the plus side, it's the good kind of bad movie. the one you keep watching just to see how much worst could it will get, so that later you can tell other people how you couldn't believe how terrible the movie was. i think everybody should watch this, so that then we could appreciate better other, REAL, movies.</p>	2.8438	2.6338	Negatif
5	<p>I very much looked forward to this movie. Its a good family movie; however, if Michael Landon Jr.'s editing team did a better job of editing, the movie would be much better. Too many scenes out of context. I do hope there is another movie from the series, they're all very good. But, if another one is made, I beg them to take better care at editing. This story was all over the place and didn't seem to have a</p>	2.3768	2.4298	Negatif

	center. Which is unfortunate because the other movies of the series were great. I enjoy the story of Willie and Missy; they're both great role models. Plus, the romantic side of the viewers always enjoy a good love story.			
...
21	Very good drama although it appeared to have a few blank areas leaving the viewers to fill in the action for themselves. I can imagine life being this way for someone who can neither read nor write. This film simply smacked of the real world: the wife who is suddenly the sole supporter, the live-in relatives and their quarrels, the troubled child who gets knocked up and then, typically, drops out of school, a jackass husband who takes the nest egg and buys beer with it. 2 thumbs up.	2.8438	3.3166	Positif
22	If only to avoid making this type of film in the future. This film is interesting as an experiment but tells no cogent story. One might feel virtuous for sitting thru it because it touches on so many IMPORTANT issues but it does so without any discernable motive. The viewer comes away with no new perspectives (unless one comes up with one while one's mind wanders, as it will invariably do during this pointless film. One might better spend one's time staring out a window at a tree growing	2.8124	2.2397	Negatif
23	Although this was obviously a low-budget production, the performances and the songs in this movie are worth seeing. One of Walken's few musical roles to date. (he is a marvelous dancer and singer and he demonstrates his acrobatic skills as well -	2.4995	2.5243	Positif

	watch for the cartwheel!) Also starring Jason Connery. A great children's story and very likable characters.			
24	<p>“All the world's a stage and its people actors in it"--or something like that. Who the hell said that theatre stopped at the orchestra pit--or even at the theatre door? Why is not the audience participants in the theatrical experience, including the story itself? This film was a grand experiment that said: "Hey! the story is you and it needs more than your attention, it needs your active participation". "Sometimes we bring the story to you, sometimes you have to go to the story” Alas no one listened, but that does not mean it should not have been said.</p>	2.5122	2.5322	Positif
25	<p>If you like adult comedy cartoons, like South Park, then this is nearly a similar format about the small adventures of three teenage girls at Bromwell High. Keisha, Natella and Latrina have given exploding sweets and behaved like bitches, I think Keisha is a good leader. There are also small stories going on with the teachers of the school. There's the idiotic principal, Mr. Bip, the nervous Maths teacher and many others. The cast is also fantastic, Lenny Henry's Gina Yashere, EastEnders Chrissie Watts, Tracy-Ann Oberman, Smack The Pony's Doon Mackichan, Dead Ringers' Mark Perry and Blunder's Nina Conti. I didn't know this came from Canada, but it is very good. Very good!</p>	2.6129	2.7225	Positif

4.3. Pengujian *Confusion Matriks*

Pengujian akurasi ini dilakukan untuk mengetahui tingkat akurasi klasifikasi *review* film yang dilakukan dengan menggunakan *Learning Vector Quantization*. Pengujian dilakukan dengan menggunakan *confusion matrix* yaitu sebuah matrik dari prediksi yang akan dibandingkan dengan kelas yang asli dari data inputa. Pengujian dilakukan dengan menggunakan 25 data *review* film yang diambil secara acak dan sudah diberi label. Data *review* tersebut akan dibandingkan dengan hasil klasifikasi yang dilakukan oleh system. Hasil pengujian akurasi analisis sentiment dapat dilihat pada Tabel 4.1

Tabel 4. 4 Tabel Pengujian Akurasi Review Film

NO	Review	Sentimen	
		Klasifikasi Secara Manual	Klasifikasi Oleh Sistem
1	Robert DeNiro plays the most unbelievably intelligent illiterate of all time. This movie is so wasteful of talent, it is truly disgusting. The script is unbelievable. The dialog is unbelievable. Jane Fonda's character is a caricature of herself, and not a funny one. The movie moves at a snail's pace, is photographed in an ill-advised manner, and is insufferably preachy. It also plugs in every cliché in the book. Swoozie Kurtz is excellent in a supporting role, but so what? Equally annoying is this new IMDB rule of requiring ten lines for every review. When a movie is this worthless, it doesn't require ten lines of text to let other readers know that it is a waste of time and tape. Avoid this movie.	Negatif	Positif
2	I saw the capsule comment said "great acting." In my opinion, these are two great actors giving horrible performances, and with zero chemistry with one another, for a great director in his all-time worst effort. Robert De Niro has to be the	Negatif	Positif

	<p>most ingenious and insightful illiterate of all time. Jane Fonda's performance uncomfortably drifts all over the map as she clearly has no handle on this character, mostly because the character is so poorly written. Molasses-like would be too swift an adjective for this film's excruciating pacing. Although the film's intent is to be an uplifting story of curing illiteracy, watching it is a true "bummer." I give it 1 out of 10, truly one of the worst 20 movies for its budget level that I have ever seen.</p>		
3	<p>This film has a special place in my heart, as when I caught it the first time, I was teaching adult literacy. It rang very true to me and even an outstanding student I had at the time. There are scenes which make you gulp with sudden emotion, and those which even put a smile on your face through sheer identification with the characters and their situation. Excellent performances by Jane Fonda and Robert DeNiro that rank with their best work, a great turn by a young Martha Plimpton, an inspiring story line, and a haunting musical score makes for a most enjoyable and rewarding experience.</p>	Positif	Positif
4	<p>This movie was terrible. at first i just read the plot summary and it looked OK, so i watched it. The acting was TERRIBLE. it was like the actor were almost camera shy. everything seemed fake. i feel bad for Edward Furlong, terminator 2 was my favorite a few years ago.. I've watched it at least 20 times.... the plot was also crap. the writers were probably sleep deprived when they came up with the lines. on the plus side, it's the good kind of bad movie. the one you keep watching just to see how much worst could it will get, so that later you can tell other people how you couldn't believe how terrible the movie</p>	Negatif	Negatif

	was. i think everybody should watch this, so that then we could appreciate better other, REAL, movies.		
5	I very much looked forward to this movie. Its a good family movie; however, if Michael Landon Jr.'s editing team did a better job of editing, the movie would be much better. Too many scenes out of context. I do hope there is another movie from the series, they're all very good. But, if another one is made, I beg them to take better care at editing. This story was all over the place and didn't seem to have a center. Which is unfortunate because the other movies of the series were great. I enjoy the story of Willie and Missy; they're both great role models. Plus, the romantic side of the viewers always enjoy a good love story.	Negatif	Positif
...
21	Very good drama although it appeared to have a few blank areas leaving the viewers to fill in the action for themselves. I can imagine life being this way for someone who can neither read nor write. This film simply smacked of the real world: the wife who is suddenly the sole supporter, the live-in relatives and their quarrels, the troubled child who gets knocked up and then, typically, drops out of school, a jackass husband who takes the nest egg and buys beer with it. 2 thumbs up.	Positif	Positif
22	If only to avoid making this type of film in the future. This film is interesting as an experiment but tells no cogent story. One might feel virtuous for sitting thru it because it touches on so many IMPORTANT issues but it does so without any discernable motive. The viewer comes away with no new perspectives (unless one comes up with one while one's mind wanders, as it will invariably do during this pointless film. One might better spend	Negatif	Positif

	one's time staring out a window at a tree growing		
23	Although this was obviously a low-budget production, the performances and the songs in this movie are worth seeing. One of Walken's few musical roles to date. (he is a marvelous dancer and singer and he demonstrates his acrobatic skills as well - watch for the cartwheel!) Also starring Jason Connery. A great children's story and very likable characters.	Positif	Positif
24	"All the world's a stage and its people actors in it"--or something like that. Who the hell said that theatre stopped at the orchestra pit--or even at the theatre door? Why is not the audience participants in the theatrical experience, including the story itself? This film was a grand experiment that said: "Hey! the story is you and it needs more than your attention, it needs your active participation". "Sometimes we bring the story to you, sometimes you have to go to the story" Alas no one listened, but that does not mean it should not have been said.	Positif	Negatif
25	If you like adult comedy cartoons, like South Park, then this is nearly a similar format about the small adventures of three teenage girls at Bromwell High. Keisha, Natella and Latrina have given exploding sweets and behaved like bitches, I think Keisha is a good leader. There are also small stories going on with the teachers of the school. There's the idiotic principal, Mr. Bip, the nervous Maths teacher and many others. The cast is also fantastic, Lenny Henry's Gina Yashere, EastEnders Chrissie Watts, Tracy-Ann Oberman, Smack The Pony's Doon Mackichan, Dead Ringers' Mark Perry and Blunder's Nina Conti. I didn't know this came from Canada, but it is very good. Very good!	Positif	Negatif

Berikut tabel *confusion matrix* :

Tabel 4. 5 Confusion Matrix

		Kelas Hasil Sistem	
		Positif	Negatif
Kelas Sudah Ditetapkan	Positif	6	4
	Negatif	0	15

Setelah sistem melakukan klasifikasi, lalu hitung *precision*, dan akurasi.

$$\text{Akurasi} = \frac{6+15}{6+15+0+4} * 100\% = 84 \%$$

$$\text{Precision} = \frac{6}{0+6} * 100\% = 100 \%$$

$$\text{Recall} = \frac{6}{4+6} * 100\% = 60 \%$$

Data pengujian akurasi yang digunakan pada Tabel 4.3 sebanyak 25 *review* film, yang terdiri dari 15 *review* positif dan 10 *review* negatif. Hasil klasifikasi yang dilakukan oleh sistem, sebanyak 19 *review* termasuk sentimen positif dan 6 *review* termasuk sentiment negatif. Berdasarkan pengujian akurasi, didapatkan hasil akurasi dari analisis sentiment dengan menggunakan *Pattern Knowegde* dan metode *Learning Vector Quantization* sebesar 84% dengan *precision* 100% dan *recall* 60%. Jadi hasil klasifikasi dengan menggunakan *Pattern Knowledge* dan metode *Learning Vector Quantization* dengan jumlah data latih 100 dan data uji 25 mendapatkan nilai akurasi sebesar 84%.

4.4. Pembahasan Hasil pengujian

Performansi akurasi dari metode didapatkan dengan menguji *learning rate*, dan *epoch* dan jumlah data yang digunakan. Dari hasil pengujian performansi algoritma *Learning Vector Quantization* (LVQ) diketahui bahwa semakin tinggi *learning rate* maka akurasi yang di dapat semakin kecil, kemudian semakin tinggi jumlah *epoch* maka akurasi semakin besar. Kalimat *review* pada data set memiliki karakteristik yang berbeda – beda, diman stiap data memiliki jumlah kalimat yang berbeda – beda sehingga memberikan hasil yang tidak konsisten. Data salah di pengaruhi oleh beberapa factor yang diantaranya sebagai berikut :

Tabel 4. 6. Analisis Hasil Klasifikasi tidak Sesuai

No	Sentimen		Indikator yang menyebabkan hasil klasifikasi tidak sama
	Klasifikasi Manual	Klasifikasi Sistem	
1.	Positif	Negatif	<p>1. Data latih ada komentar yang membandingkan antar film sehingga data yang di proses menjadi ambigu.</p> <p>2. Proses <i>pattern knowledge</i> yang mengacu pada <i>pattern rule</i> yang berjumlah 18 <i>pattern</i>. Banyak token token yang tidak memenuhi aturan dalam <i>pattern rule</i> sehingga nilai bobot yang di hasilkan ketika keluar dari <i>pattern rule</i> menjadi 0 (nol) dan nilai jarak yang di hasilkan menjadi tidak sesuai dengan kelas target sebelumnya seperti contoh berikut :</p> <pre> ----- PATTERN 1 : ['good', 'JJ', 'adaptation', 'NN'] BOBOT : 1 PATTERN 2 : ----- BOBOT : 0 PATTERN 3 : ----- BOBOT : 0 PATTERN 4 : ----- BOBOT : 0 PATTERN 5 : ----- BOBOT : 0 PATTERN 6 : ----- BOBOT : 0 PATTERN 7 : ----- BOBOT : 0 PATTERN 8 : ----- BOBOT : 0 PATTERN 9 : ----- BOBOT : 0 PATTERN 10 : ['story', 'NN'] BOBOT : 1 PATTERN 11 : ----- BOBOT : 0 PATTERN 12 : ----- BOBOT : 0 PATTERN 13 : ----- BOBOT : 0 PATTERN 14 : ----- BOBOT : 0 PATTERN 15 : ----- BOBOT : 0 PATTERN 16 : ----- BOBOT : 0 PATTERN 17 : ----- BOBOT : 0 PATTERN 18 : ----- BOBOT : 0 Codebook Vector : [1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0] ----- </pre>

