

BAB VI

PENUTUP

A. Kesimpulan

Analisis sentimen terhadap teks ulasan produk kecantikan dapat dilakukan dalam beberapa tahapan yang dapat dibagi dalam dua kelompok. Tahapan dalam kelompok pertama berfungsi untuk mempersiapkan dan memvisualisasikan *dataset*, sedangkan tahapan dalam kelompok kedua berfungsi untuk pembentukan model dan implementasi model ke dalam sistem web. Tahapan dalam kelompok pertama terdiri dari pelabelan *dataset*, pengumpulan *dataset*, *data preprocessing*, dan visualisasi teks ulasan menggunakan grafik *wordcloud*. Tahapan dalam kelompok kedua, yaitu perancangan arsitektur model awal, pelatihan model awal, evaluasi performa model awal, *hyperparameter tuning*, pelatihan dan evaluasi performa model dengan *hyperparameter tuning*, dan implementasi model dan pengujian sistem. Dengan menggunakan metode *deep learning* dengan arsitektur *Long Short-Term Memory* (LSTM), penelitian ini berhasil membentuk model yang bisa digunakan untuk melakukan analisis sentimen positif dan negatif terhadap ulasan produk kecantikan. Model yang dihasilkan mendapatkan skor *specificity* dan *recall* masing-masing sebesar 0,945 dan 0,909.

B. Saran

Penelitian ini memiliki dua kekurangan yang dapat diperbaiki pada penelitian selanjutnya. Kekurangan pertama adalah *imbalanced dataset*, sedangkan kekurangan kedua adalah *dataset* yang digunakan kemungkinan masih mengandung nilai *rating* dan teks ulasan yang tidak sejalan. *Imbalanced dataset* dapat diatasi dengan menambah data baru untuk kelas minoritas, menghapus data pada kelas mayoritas, serta menggunakan teknik *Synthetic Minority Oversampling* (SMOTE). Kekurangan kedua dapat ditanggulangi dengan meningkatkan kualitas pada tahap *data preprocessing*.

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LAMPIRAN

A. Lazada

Tabel 8.1 Daftar *header* untuk pengambilan data ulasan di *e-commerce* Lazada

Nama Header	Nilai
authority	my.lazada.co.id
accept	*/*
accept-language	en-GB,en;q=0.9,en-US;q=0.8
dnt	1
origin	https://www.lazada.co.id/
refer	https://www.lazada.co.id/
sec-ch-ua	"Not/A)Brand";v="99", "Microsoft Edge";v="115", "Chromium";v="115"
sec-fetch-mode	cors
sec-fetch-site	same-site
user-agent	Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/115.0.0.0 Safari/537.36 Edg/115.0.1901.188
x-requested-with	XMLHttpRequest
x-csrf-token	f45bbe793b87e

Tabel 8.2 Daftar konstanta untuk pengambilan data ulasan di *e-commerce* Lazada

Nama Konstanta	Nilai	Keterangan
API_URL	https://my.lazada.co.id/pdp/review/getReviewList	Alamat URL dari API Lazada untuk mendapatkan komentar pembeli
DEFAULT_PAGE_SIZE	20	Batas jumlah komentar yang ingin di <i>request</i> setiap pengulangan
DS_DIR_PATH	<code>os.path.join(os.getcwd(), 'dataset')</code>	Alamat penyimpanan <i>dataset</i> yang telah berhasil didapatkan

Tabel 8.3 Daftar data produk untuk pengambilan data ulasan pada *e-commerce* Lazada

Nama Produk	Id Produk	Tanggal Pengambilan
Eyeshadow lameila 12 warna ~ play color eyes lameila 111 zoom fashion	6775042962	4 Agustus 2023
Lipstik padat Maybelline Revlon / hold morning lipstik warna terbaru	6574328602	4 Agustus 2023
Oil lash serum alis dan bulu mata	6654080152	4 Agustus 2023
Lameila 1001 bb cream foundation concealer super wearing lasting inbox fashion	6783170214	4 Agustus 2023
Lameila lip glaze	6771434242	4 Agustus 2023
Lameila fashion matte eyeshadow pallet makeup	5825704762	4 Agustus 2023

B. Sephora

Tabel 8.4 Daftar *header* untuk pengambilan data ulasan di *e-commerce* Sephora

Nama Header	Nilai
Accept	*/*
Accept-Encoding	gzip, deflate, br
Connection	keep-alive
Accept-Language	id-ID

Tabel 8.5 Daftar konstanta untuk pengambilan data ulasan di *e-commerce* Sephora

Nama Konstanta	Nilai	Keterangan
API_URL	<code>https://www.sephora.co.id/api/v2.4/products/{product_name}/reviews?page[number]={page_number}&page[size]={page_size}</code>	Alamat URL dari API Sephora untuk mendapatkan komentar pembeli
DEFAULT_PAGE_SIZE	500	Batas jumlah komentar yang ingin diambil dalam setiap <i>request</i>
DS_DIR_PATH	<code>os.path.join(os.getcwd(), 'dataset')</code>	Alamat penyimpanan <i>dataset</i> yang telah berhasil didapatkan

Tabel 8.6 Daftar produk untuk pengambilan data ulasan pada *e-commerce* Sephora

Nama Produk	Id Produk	Tanggal Pengambilan
Sunday riley luna sleeping night oil	sunday-riley-luna-sleeping-night-oil	12 Maret 2023
Sephora collection waterproof eye makeup remover	sephora-collection-waterproof-eye-makeup-remover	12 Maret 2023
Sephora collection color hit nail polish 8400	sephora-collection-color-hit-nail-polish-8400	12 Maret 2023
Supergoop play everyday lotion spf 50 with sunflower extract	supergoop-play-everyday-lotion-spf-50-with-sunflower-extract	12 Maret 2023
Supergood glowscreen spf 40	supergoop-glowscreen-spf-40	12 Maret 2023
Sephora collection colorful eyeshadow mono	sephora-collection-colorful-eyeshadow-mono	12 Maret 2023
Sephora collection best skin ever perfect natural finish longwear foundation	sephora-collection-best-skin-ever-perfect-natural-finish-longwear-foundation	12 Maret 2023
Supergood cc screen 100% mineral cc cream broad spectrum sunscreen spf 50 pa+++	supergoop-cc-screen-100-percent-mineral-cc-cream-broad-spectrum-sunscreen-spf-50-pa-plus-plus-plus	12 Maret 2023
Sephora collection retract waterproof eyeliner	sephora-collection-retract-waterproof-eyeliner	12 Maret 2023
Sephora collection 12 th colorful contour eye pencil waterproof eyeliner	sephora-collection-12h-colorful-contour-eye-pencil-waterproof-eyeliner	12 Maret 2023

Supergood 100% mineral sunscreen mist spf 30	supergoop-100-percent-mineral-sunscreen-mist-spf-30	12 Maret 2023
Supergoop glow oil spf 50	supergoop-glow-oil-spf-50	12 Maret 2023
Anastasia Beverly hills dipbrow pomade	anastasia-beverly-hills-dipbrow-pomade	21 Juni 2023
Dior addict lip glow lip balm	dior-addict-lip-glow-lip-balm	21 Juni 2023
Rare beauty soft pinch liquid blush	rare-beauty-soft-pinch-liquid-blush	22 Juni 2023
Rare beauty lip souffle mate lip cream	rare-beauty-lip-souffle-matte-lip-cream	22 Juni 2023
Anastasia Beverly hills brow wiz	anastasia-beverly-hills-brow-wiz	22 Juni 2023
Rare beauty warm wishes effortless bronzer stick	rare-beauty-warm-wishes-effortless-bronzer-stick	22 Juni 2023
Bobbi brown vitamin enriched face base moisturizer and primer	bobbi-brown-vitamin-enriched-face-base-moisturizer-and-primer	22 Juni 2023
Rare beauty perfect strokes universal volumizing mascara	rare-beauty-perfect-strokes-universal-volumizing-mascara	22 Juni 2023
Rare beauty always an optimist pore diffusing primer	rare-beauty-always-an-optimist-pore-diffusing-primer	22 Juni 2023
Anastasia beverly hills brow definer	anastasia-beverly-hills-brow-definer	22 Juni 2023
Rare beauty an optimist soft radiance setting powder	rare-beauty-always-an-optimist-soft-radiance-setting-powder	22 Juni 2023
Rare beauty perfect strokes matte liquid eye liner	rare-beauty-perfect-strokes-matte-liquid-eye-liner	22 Juni 2023

Sephora collection cream lip stain	sephora-collection-cream-lip-stain	22 Juni 2023
Nars radiant creamy concealer	nars-radiant-creamy-concealer	22 Juni 2023
Rare beauty liquid touch brightening concealer	rare-beauty-liquid-touch-brightening-concealer	22 Juni 2023
Benefit cosmetic goof proof brow pencil	benefit-cosmetics-goof-proof-brow-pencil	22 Juni 2023
Anastasia beverly hills brow freeze brow styling wax	anastasia-beverly-hills-brow-freeze-brow-styling-wax	22 Juni 2023
Anastasia beverly hills clear brow gel	anastasia-beverly-hills-clear-brow-gel	22 Juni 2023
Benefit cosmetics gimme brow plus volumizing eyebrow gel mini 850	benefit-cosmetics-gimme-brow-plus-volumizing-eyebrow-gel-mini-850	22 Juni 2023
Rare beauty soft pinch tinted lip oil	rare-beauty-soft-pinch-tinted-lip-oil	3 Agustus 2023
Dior addict lip maximizer plumping gloss	dior-addict-lip-maximizer-plumping-gloss	3 Agustus 2023
Estee lauder advanced night repair synchronized multi recovery complex serum	estee-lauder-advanced-night-repair-synchronized-multi-recovery-complex-serum	3 Agustus 2023

C. Shopee

Tabel 8.7 Daftar *header* untuk pengambilan data ulasan di *e-commerce* Shopee

Nama Header	Nilai
authority	shopee.co.id
accept	*/*
accept-language	en-GB,en;q=0.9,en-US;q=0.8
dnt	1
if-none-match	55b03-a61e75a511bf8e56a499f48de3152bd9
referer	https://shopee.co.id/buyer/39480706/rating
sec-sc-ua	Chromium";v="112", "Microsoft Edge";v="112", "Not:A-Brand";v="99"
sec-sc-ua-mobile	?0
sec-sc-ua-platform	"Windows"
sec-fetch-site	same-origin
user-agent	Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/112.0.0.0 Safari/537.36 Edg/112.0.1722.68
x-api-source	pc
x-requested-with	XMLHttpRequest
x-shopee-language	id

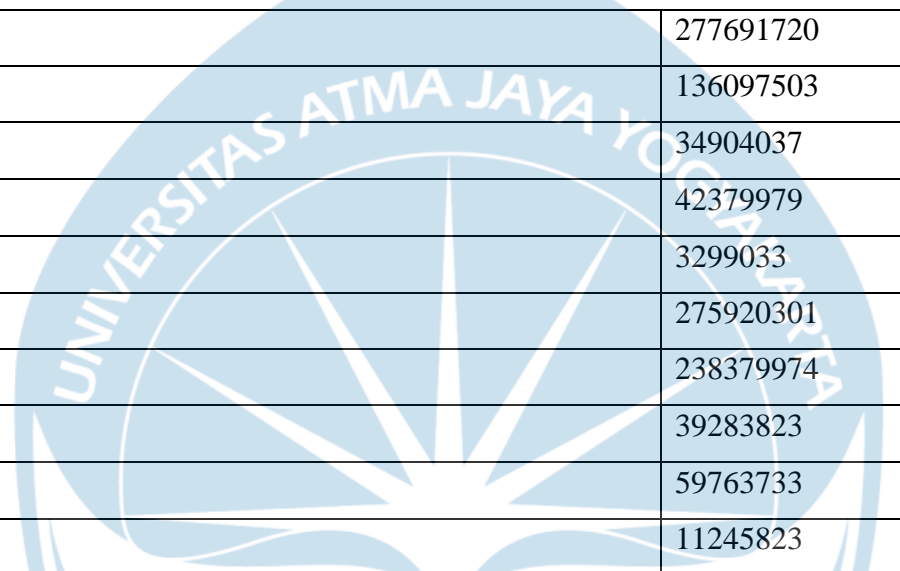
Tabel 8.8 Daftar konstanta untuk pengambilan data ulasan di *e-commerce* Shopee

Nama Konstanta	Nilai	Keterangan
API_URL	https://shopee.co.id/api/v4/seller_operation/get_shop_ratings?limit=10&offset=6&shop_id=39479320&user_id=5676	Alamat URL dari API Shopee untuk mendapatkan komentar pembeli
DEFAULT_LIMIT	10	Batas jumlah komentar yang ingin diambil dalam setiap <i>request</i>
DS_DIR_PATH	os.path.join(os.getcwd(), 'dataset')	Alamat penyimpanan <i>dataset</i> yang telah berhasil didapatkan

Tabel 8.9 Daftar data *brand* untuk pengambilan data ulasan pada *e-commerce* Shopee

Nama Brand	Id Produk	Tanggal Pengambilan
Scarlett Whitening	98113780	9 Maret 2023
Emina	63983008	9 Maret 2023
Purbasari	3741929	9 Maret 2023
Dear Me Beauty	45495764	9 Maret 2023
Makeover	63984475	9 Maret 2023
Moko Moko	76793963	9 Maret 2023
Rollover Reaction	80079301	9 Maret 2023

Goban	39101452	9 Maret 2023
Esqa	60328369	9 Maret 2023
Blp Beauty	127651884	9 Maret 2023
Mad for Makeup	59474489	9 Maret 2023
Luxcrime	3278276	10 Maret 2023
Rose All Day	61751874	10 Maret 2023
Somehinc	195455930	10 Maret 2023
Mineral Botanica	124549994	10 Maret 2023
Sariayu	138164542	10 Maret 2023
Viva	255024673	10 Maret 2023
Latulipe	131133483	10 Maret 2023
Madame Gie	94309880	10 Maret 2023
Sasc	64639547	10 Maret 2023
Polka	105981668	10 Maret 2023
Pink Berry	225446986	10 Maret 2023
Trope	58842579	10 Maret 2023
Rivera	15093776	10 Maret 2023
Roes	502216976	10 Maret 2023



Bueno	277691720	10 Maret 2023
Sada	136097503	10 Maret 2023
Marthatilaar	34904037	10 Maret 2023
Ql	42379979	10 Maret 2023
Bless	3299033	10 Maret 2023
Masami	275920301	10 Maret 2023
Nacific	238379974	10 Maret 2023
Nivea	39283823	10 Maret 2023
Wardah	59763733	10 Maret 2023
Mustika Ratu	11245823	10 Maret 2023

D. Sociolla

Tabel 8.10 Daftar *header* untuk pengambilan data ulasan di *e-commerce* Sociolla

Nama Header	Nilai
Accept	*/*
Connection	keep-alive
Host	soco-api.sociolla.com

Tabel 8.11 Daftar konstanta untuk pengambilan data ulasan di *e-commerce* Sociolla

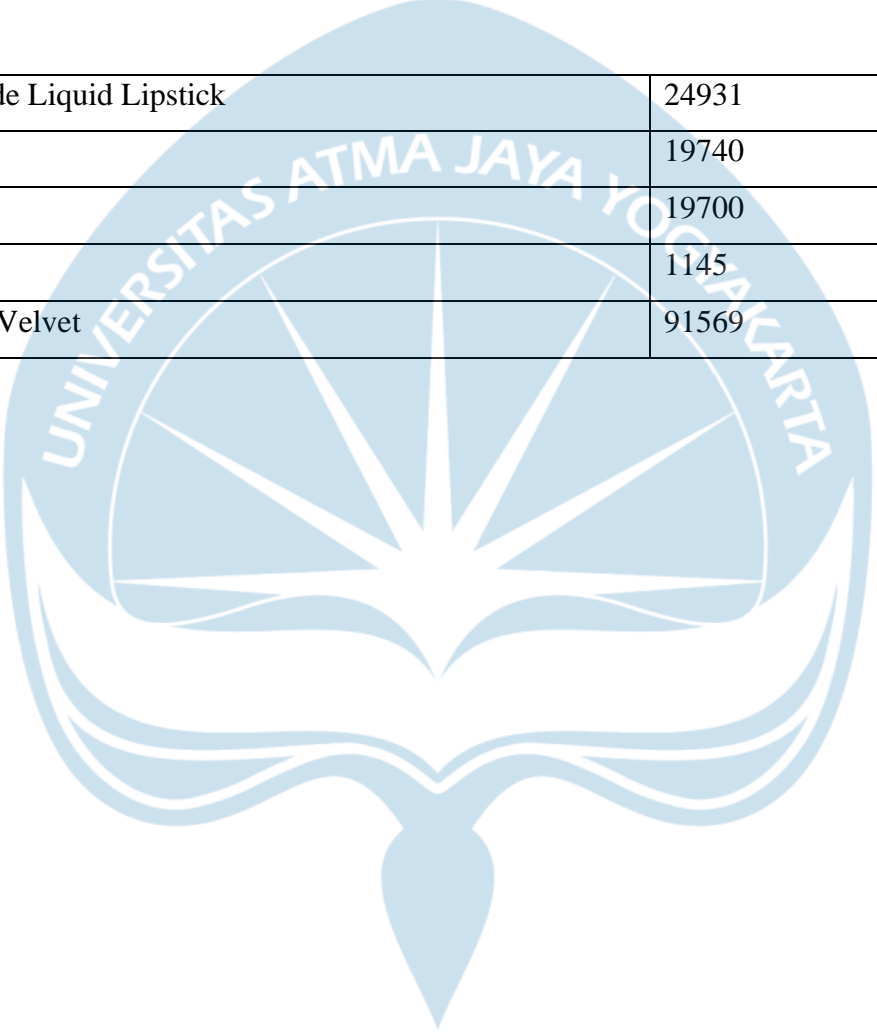
Nama Konstanta	Nilai	Keterangan
API_URL	https://soco-api.sociolla.com/reviews	Alamat URL dari API Sociolla untuk mendapatkan komentar pembeli
DEFAULT_LIMIT	20	Batas jumlah komentar yang ingin diambil dalam setiap <i>request</i>
DS_DIR_PATH	<code>os.path.join(os.getcwd(), 'dataset')</code>	Alamat penyimpanan <i>dataset</i> yang telah berhasil didapatkan

Tabel 8.12 Daftar data produk untuk pengambilan data ulasan pada *e-commerce* Sociolla

Nama Produk	Id Produk	Tanggal Pengambilan
Aloe Soothing Sun Cream SPF 50+ PA+++	19048	14 Maret 2023
Everyday BB Cream	2070	16 Maret 2023
Lightening Gentle Exfoliator	651	16 Maret 2023

Sun Battle SPF 30 PA+++	791	16 Maret 2023
Perfect Hydrating Treatment Essence	11251	16 Maret 2023
UV Defender Serum Protector Bright & Clear SPF50+ PA+++	84706	18 Maret 2023
Low ph Good Morning Cleanser	6400	18 Maret 2023
Extraordinary Oil – Gold	68332	18 Maret 2023
AHA BHA Clarifying Treatment Toner	6386	18 Maret 2023
Garnier Micellar Water	19471	18 Maret 2023
Biore UV Aqua Rich Watery Essence SPF 50+ PA+++	2559	18 Maret 2023
Senka – Perfect Whip	19133	19 Maret 2023
Essence Toner	21979	19 Maret 2023
Micellar Water Biphase	19485	19 Maret 2023
Skin Conditioner	1216	19 Maret 2023
Teatree Essential Mask	19576	19 Maret 2023
Miraculous Refining Toner	33303	19 Maret 2023
Carasun Solar Smart UV Protector SPF 45 PA+++ Sunscreen	80032	19 Maret 2023
Advanced Snail Mucin 96 Power Essence	6384	19 Maret 2023
Hydrashoothe Sunscreen Gel Spf45+++	82166	19 Maret 2023
Face Toner Cica Series	36290	19 Maret 2023

Salicylic Acid Daily Gentle Cleanser	19703	19 Maret 2023
Sensibo H2O Micellar Water	2047	19 Maret 2023
Sugar Rush Lip Scrub	959	19 Maret 2023
5X Creamie Barrier Moisture Gel	92496	19 Maret 2023
Garnier Hydrabomb Serum Mask	19764	19 Maret 2023
Acne Patch Night	24938	19 Maret 2023
UV Moisture Milk	1656	19 Maret 2023
Gentle Skin Cleanser	2021	22 Juni 2023
Ointment	19544	22 Juni 2023
Masquerade Face Mask	25323	22 Juni 2023
My Mood Maker Chic	72687	22 Juni 2023
Esqa Lip Gloss	34147	22 Juni 2023
Flawless Priming Water	19420	22 Juni 2023
Gokujyun Ultimate Moisturizing Milk	1665	22 Juni 2023
Face Wash Tamagohada Ultimate Mild Peeling	1673	22 Juni 2023
Sebium Gel Moussant	1970	22 Juni 2023
Moist In a Bottle Moisturizer	1000	22 Juni 2023
Garnier Light Complete White Speed Serum Cream Extra SPF 19 PA+++	19469	3 Agustus 2023



Superstay Matte Ink Un-Nude Liquid Lipstick	24931	3 Agustus 2023
Superstay Matte Ink	19740	4 Agustus 2023
Fresh Herb Origin Serum	19700	4 Agustus 2023
Intense Matte Lip Cream	1145	4 Agustus 2023
Cherry Makes Cheerful Lip Velvet	91569	4 Agustus 2023

E. Tokopedia

Tabel 8.13 Daftar *header* untuk pengambilan data ulasan di *e-commerce* Tokopedia

Nama Header	Nilai
authority	gql.tokopedia.com
accept	*/*
accept-language	en-GB,en;q=0.9,en-US;q=0.8
content-type	application/json
dnt	1
origin	https://www.tokopedia.com
sec-ch-ua	"Chromium";v="112", "Microsoft Edge";v="112", "Not:A-Brand";v="99"
sec-ch-ua-mobile	?0
sec-ch-ua-platform	Windows
sec-fetch-site	same-site
user-agent	Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/112.0.0.0 Safari/537.36 Edg/112.0.1722.68
x-source	tokopedia-lite
x-tkpd-lite-service	zeus
x-version	e9ad44a

Tabel 8.14 Daftar *request body* untuk pengambilan data ulasan di *e-commerce* Tokopedia

Nama Request Body	Nilai
	<pre>[{ "operationName": "ReviewList", "variables": { "shopID": "2625052", "page": 2, "limit": 10, "sortBy": "create_time desc", "filterBy": "" }, "query": "query ReviewList(\$shopID: String!, \$limit: Int!, \$page: Int!, \$filterBy: String, \$sortBy: String) {\n productrevGetShopReviewReadingList(shopID: \$shopID, limit: \$limit, page: \$page, filterBy: \$filterBy, sortBy: \$sortBy) {\n list {\n id: reviewID\n product {\n productID\n productName\n productImageURL\n productPageURL\n productStatus\n isDeletedProduct\n productVariant {\n variantID\n variantName\n __typename\n }\n __typename\n }\n rating\n reviewTime\n reviewText\n reviewerID\n reviewerName\n avatar\n replyText\n replyTime\n attachments {\n attachmentID\n thumbnailURL\n fullsizeURL\n __typename\n }\n videoAttachments {\n attachmentID\n videoUrl\n __typename\n }\n state {\n isReportable\n isAnonymous\n __typename\n }\n likeDislike {\n totalLike\n likeStatus\n __typename\n }\n badRatingReasonFmt\n __typename\n }\n hasNext\n shopName\n totalReviews\n __typename\n }\n}\n}" }]</pre>

Tabel 8.15 Daftar konstanta untuk pengambilan data ulasan di *e-commerce* Tokopedia

Nama Konstanta	Nilai	Keterangan
API_URL	<code>https://gql.tokopedia.com/graphql/ReviewList</code>	Alamat URL dari API Tokopedia untuk mendapatkan komentar pembeli
DEFAULT_LIMIT	10	Batas jumlah komentar yang ingin diambil dalam setiap <i>request</i>
DS_DIR_PATH	<code>os.path.join(os.getcwd(), 'dataset')</code>	Alamat penyimpanan <i>dataset</i> yang telah berhasil didapatkan

Tabel 8.16 Daftar data *brand* untuk pengambilan data ulasan pada *e-commerce* Tokopedia

Nama Brand	Id Produk	URL Review Brand	Tanggal Pengambilan
Scarlett Whitening	2625052	<code>https://www.tokopedia.com/scarlettwhite/review</code>	8 Maret 2023
Emina	6091299	<code>https://www.tokopedia.com/emina-official/review</code>	8 Maret 2023
Purbasari	276092	<code>https://www.tokopedia.com/purbasari/review</code>	8 Maret 2023
Dear Me Beauty	2738461	<code>https://www.tokopedia.com/dearme/review</code>	8 Maret 2023
Makeover	6091553	<code>https://www.tokopedia.com/officialmakeover/review</code>	8 Maret 2023
Moko Moko	2770240	<code>https://www.tokopedia.com/mokomokoofficial/review</code>	8 Maret 2023
Rollover Reaction	8319453	<code>https://www.tokopedia.com/rolloverreaction/review</code>	9 Maret 2023
Goban	3605068	<code>https://www.tokopedia.com/gobancosmetics/review</code>	9 Maret 2023

Esqa	4761908	https://www.tokopedia.com/esqacosmetics/review	9 Maret 2023
Blp Beauty	2900897	https://www.tokopedia.com/blpbeauty/review	9 Maret 2023
Mad for Makeup	3365115	https://www.tokopedia.com/madformakeup/review	9 Maret 2023
Luxcrime	751247	https://www.tokopedia.com/luxcrime/review	9 Maret 2023
Rose all Day	2943211	https://www.tokopedia.com/rose-all-day/review	9 Maret 2023
Somethinc	5852874	https://www.tokopedia.com/somethinc/review	9 Maret 2023
Mineral Botanica	4782259	https://www.tokopedia.com/mineralbotanica/review	9 Maret 2023
Sariayu	5522695	https://www.tokopedia.com/sariayuofficial/review	9 Maret 2023
Viva	8489263	https://www.tokopedia.com/vivacosmetic/review	9 Maret 2023
Latulipe	12585846	https://www.tokopedia.com/latulipe/review	9 Maret 2023
Madame Gie	4413685	https://www.tokopedia.com/madamegie/review	9 Maret 2023
Sasc	2939101	https://www.tokopedia.com/sasc-cosmetic/review	9 Maret 2023
Polka	3965380	https://www.tokopedia.com/polkacosmetics/review	9 Maret 2023
Pink Berry	8417428	https://www.tokopedia.com/pinkberrybeautys/review	9 Maret 2023
Mizzu	7821016	https://www.tokopedia.com/mizzucosmetics/review	9 Maret 2023
Trope	3162155	https://www.tokopedia.com/tropecosmetics/review	9 Maret 2023
Rivera	1563679	https://www.tokopedia.com/riveracosmetics/review	9 Maret 2023
Roes	12010681	https://www.tokopedia.com/roescosmetics/review	9 Maret 2023

Bueno	8897903	https://www.tokopedia.com/bueno/review	9 Maret 2023
Sada	5754624	https://www.tokopedia.com/sadabycathy/review	9 Maret 2023
Marthatilaar	2570559	https://www.tokopedia.com/marthatilaarshop/review	9 Maret 2023
QL	2616426	https://www.tokopedia.com/qlcosmetic/review	9 Maret 2023
Bless	966379	https://www.tokopedia.com/blesscsmeticsid/review	9 Maret 2023
Igun Cosmetics	3337693	https://www.tokopedia.com/iguncosmetics/review	9 Maret 2023
Zoya	2127356	https://www.tokopedia.com/zoya-cosmetics/review	9 Maret 2023
Masami	11153266	https://www.tokopedia.com/masamiofficial/review	9 Maret 2023
Beauty USA	11624459	https://www.tokopedia.com/beautyusa/review	9 Maret 2023
Nacific	8044023	https://www.tokopedia.com/nacificofficial/review	9 Maret 2023
Kay	593654	https://www.tokopedia.com/kay-collection/review	9 Maret 2023
Nivea	5222533	https://www.tokopedia.com/niveaofficial/review	9 Maret 2023
Wardah	3404093	https://www.tokopedia.com/wardah-official/review	9 Maret 2023
Mustika Ratu	1672024	https://www.tokopedia.com/mustika-ratu/review	9 Maret 2023

F. Amazon

Tabel 8.17 Alamat situs penyedia *dataset* ulasan produk kecantikan dari *e-commerce* Amazon

Alamat Situs Penyedia <i>Dataset</i>
https://cseweb.ucsd.edu/~jmcauley/datasets/amazon_v2/
https://huggingface.co/datasets/amazon_us_reviews/viewer/Personal_Care_Appliances_v1_00/train