Application of Data Mining to Predict Sales of the Best-Selling Dolls at Chudalla Store Using the *K-Nearest Neighbor* (K-NN) Method

Winda Erika

Computer System, Faculty of Science and Technology
University Of Pembangunan Panca Budi, Indonesia

ABSTRACT

Sales are important for the success of a shop to survive amidst business competition. Chudalla Store continues to innovate to increase doll sales every day. So that the dolls sold experience continuous change of goods. So that the stock of dolls does not pile up and cause losses to the shop owner. Data mining is a data collection technique that is suitable for use in business, especially for predicting sales of goods. There are several methods in data mining, one of which is the *K-Nearest Neighbor* (K-NN) method which is suitable for use as a method for predicting sales of the best-selling dolls at the Chudalla Store. The *K-Nearest Neighbor (K-NN)* method is a method in data mining that is often used to classify new objects and is also often used as a predictive value for solving problems in the business industry. The *K-Nearest Neighbor (K-NN)* method helps in predicting the best selling dolls at Chudalla Store.

Keywords: ***Data Mining, K-Nearest Neighbor (K - NN) , Prediction, Dolls***

Corresponding Author:

Winda Erika
Computer System, Faculty of Science and Technology, University Of Pembangunan Panca Budi, Indonesia

Email: windaerika89@email.com

1. INTRODUCTION

Chudalla Store is located in the Pinang City area, South Labuhan Batu, which is one of the districts in North Sumatra . Chudalla Store sells all kinds of dolls, both dolls for children and adults, which are often used as gifts to give to friends, family and loved ones. There are approximately 50 types of dolls sold at the Chudalla Store at varying prices. Sometimes, of the various types of dolls sold, some are the best sellers and some are not sold at all, and some dolls even experience a decline in sales. This is because the dolls sold usually follow the trend of cartoons being used as dolls which are currently viral and are more popular among the public, especially children who like playing with dolls. Meanwhile, dolls that are not in great demand pile up and are not sold. To avoid this, a prediction of the best-selling doll sales was carried out using data mining techniques using the *K-Nearest Neighbor* (K-NN) method. So you can predict the sales of the best-selling dolls at the Chudalla Store to make it easier for the store to provide stock of the best-selling dolls. Where the *K-Nearest Neighbor method* produces best-selling doll predictions according to the target accuracy value achieved.

2. RESEARCH METHODOLOGY

1) Stages of Research Methods

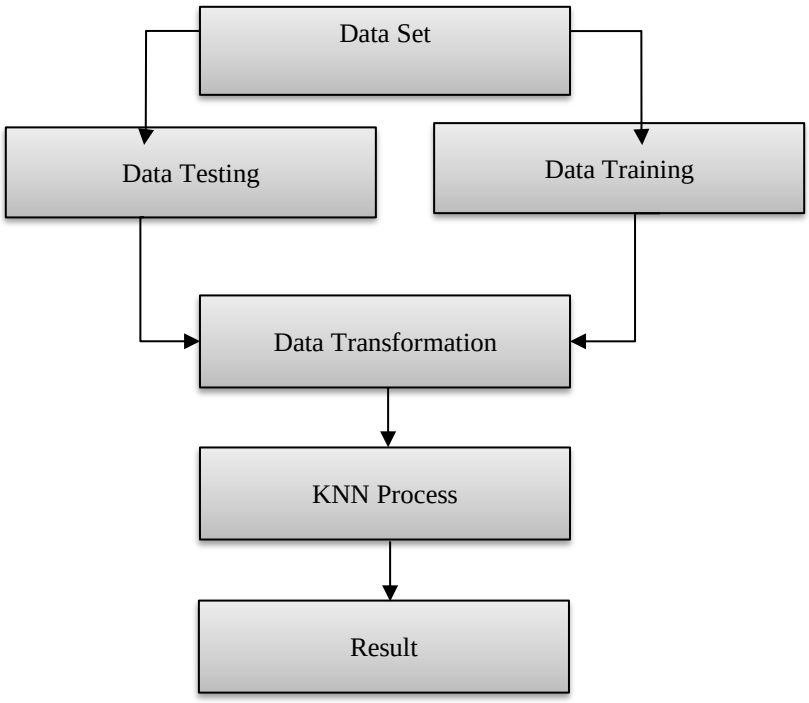

Figure 1. Research Framework

The steps for K-Nearest Neighbor (K-NN) :

a) Determine k, namely the shortest distance
b) Calculating distances with Euclidean Distance
   Formula : $\sqrt{\sum_{I=1}^{K}(X1-Y1)^2+(X2-Y2)^2}$
   Xi = Value in the training data
   Yi = The value in the testing data
   k = Attribute dimension
c) Sort the results in ascending order for ranking from the largest to the lowest doll sales data.

2) Data Analysis
   The training data used is doll sales data for the last 3 months taken from August, September and October 2023.

Table 1. Doll sales data from August, September and October 2023.

No.	Doll Name	Doll Stock	Products Sold		
			August	September	October
1	Hello Kitty doll	100	20	30	15
2	Spongebob doll	50	10	1	4
3	Mickey Mouse doll	50	5	2	0
4	Minnie Mouse Doll	50	5	0	0
5	Upin doll	50	5	2	1
6	Ipin doll	50	5	1	0
7	Smile Doll	50	4	3	1
8	Minion Dolls	50	5	7	1
9	Donut Doll	100	6	1	7
10	Winnie doll	50	2	3	9
11	Panda doll	50	12	5	3
12	Barbie doll	50	12	7	2
13	Unicorn Doll	50	18	4	6
14	LOL Dolls	50	10	3	8
15	Teddy Bear	50	35	5	0

16	Boba Doll	50	25	9	2
17	Mcqueen doll	50	6	5	0
18	Cropy Doll	50	0	5	10
19	Pororo doll	50	2	9	9
20	Doraemon doll	100	30	35	20
21	Pig Doll	100	13	2	2
22	Snoopy doll	50	0	1	1
23	Rabbit Doll	100	18	2	6
24	Crocodile Doll	50	0	9	2
25	Duck doll	50	6	4	1
26	Sheep Doll	50	1	5	5
27	Cow Doll	100	3	3	7
28	Baby Elephant Doll	50	0	10	4
29	Monkey Puppet	50	0	3	2
30	Marsha Doll	50	10	3	0
31	Love Doll	100	5	9	10
32	Stitch Doll	100	5	8	3
33	Pokemon Dolls	50	2	3	5
34	Petrick Doll	50	3	4	6
35	Dino Doll	50	0	4	2
36	Cinnamoro doll	50	10	20	5
37	Graduation Doll	100	35	15	20
38	Paint Doll	50	5	9	2
39	Candy Doll	50	5	10	0
40	Tiger doll	50	0	4	6
41	Lion doll	50	0	3	1
42	Hamster Doll	100	10	2	0
43	Character Sofa Doll	100	5	3	7
44	Yum-Yum Pillow Doll	50	2	4	0
45	Ball Puppet	50	1	8	2
46	Bird doll	50	4	2	1
47	Totoro doll	50	24	0	3
48	Boboboy doll	50	10	0	5
49	Bobo Doll	50	0	0	2
50	Giraffe Plush	50	10	0	5

3. RESEARCH RESULTS

1) The application of K-Nearest Neighbor (K-NN) to predict sales of the best-selling dolls based on doll sales provisions obtained the following data transformation results:

Table 2. Data Transformation

No.	Doll Name	Doll Stock	Dolls Sold			Total Sales	Information
			August	September	October		
1	Hello Kitty doll	100	20	30	15	65	Bestseller
2	Spongebob doll	50	10	1	4	15	Not Selling
3	Mickey Mouse doll	50	5	2	0	7	Not Selling
4	Minnie Mouse Doll	50	5	0	0	5	Not Selling
5	Upin doll	50	5	2	1	8	Not Selling
6	Ipin doll	50	5	1	0	6	Not Selling
7	Smile Doll	50	4	3	1	8	Not Selling
8	Minion Dolls	50	5	7	1	13	Not Selling
9	Donut Doll	100	6	1	7	14	Not Selling
10	Winnie doll	50	2	3	9	14	Not Selling
11	Panda doll	50	12	5	3	20	Not Selling
12	Barbie doll	50	12	7	2	21	Bestseller
13	Unicorn Doll	50	18	4	6	28	Bestseller
14	LOL Dolls	50	10	3	8	21	Not Selling

15	Teddy Bear	50	35	5	0	40	Bestseller
16	Boba Doll	50	25	9	2	36	Bestseller
17	Mcqueen doll	50	6	5	0	11	Not Selling
18	Cropy Doll	50	0	5	10	15	Not Selling
19	Pororo doll	50	2	9	9	20	Not Selling
20	Doraemon doll	100	30	35	20	85	Bestseller
21	Pig Doll	100	13	2	2	17	Not Selling
22	Snoopy doll	50	0	1	1	2	Not Selling
23	Rabbit Doll	100	18	2	6	26	Bestseller
24	Crocodile Doll	50	0	9	2	11	Not Selling
25	Duck doll	50	6	4	1	11	Not Selling
26	Sheep Doll	50	1	5	5	11	Not Selling
27	Cow Doll	100	3	3	7	13	Not Selling
28	Baby Elephant Doll	50	0	10	4	14	Not Selling
29	Monkey Puppet	50	0	3	2	5	Not Selling
30	Marsha Doll	50	10	3	0	13	Not Selling
31	Love Doll	100	5	9	10	24	Not Selling
32	Stitch Doll	100	5	8	3	16	Not Selling
33	Pokemon Dolls	50	2	3	5	10	Not Selling
34	Petrick Doll	50	3	4	6	13	Not Selling
35	Dino Doll	50	0	4	2	6	Not Selling
36	Cinnamoro doll	50	10	20	5	35	Bestseller
37	Graduation Doll	100	35	15	20	70	Bestseller
38	Paint Doll	50	5	9	2	16	Not Selling
39	Candy Doll	50	5	10	0	15	Not Selling
40	Tiger doll	50	0	4	6	10	Not Selling
41	Lion doll	50	0	3	1	4	Not Selling
42	Hamster Doll	100	10	2	0	12	Not Selling
43	Character Sofa Doll	100	5	3	7	15	Not Selling
44	Yum-Yum Pillow Doll	50	2	4	0	6	Not Selling
45	Ball Puppet	50	1	8	2	11	Not Selling
46	Bird doll	50	4	2	1	7	Not Selling
47	Totoro doll	50	24	0	3	27	Bestseller
48	Boboboy doll	50	10	0	5	15	Not Selling
49	Bobo Doll	50	0	0	2	2	Not Selling
50	Giraffe Plush	50	10	0	5	15	Not Selling

2) Next, normalize the data using the minimum and maximum values of doll sales during the last three months. The following are the results of data normalization calculations using minimum and maximum formulas:
Formula:

$$x' = x - \min(x) / \max(x) - \min(x)$$

Information:
x'= new scale value
x = data value before normalization
min = lowest data value
max = highest data value

Table 3. Max Min Normalization Calculation Results

No.	Min Max Doll Stock	Results	Min Max Doll Sold	Results
1	100 - 50 / 100 - 50 =	1	65 - 2 / 85 - 2 =	0.759
2	50 - 50 / 100 - 50 =	0	15 - 2 / 85 - 2 =	0.1566
3	50 - 50 / 100 - 50 =	0	7 - 2 / 85 - 2 =	0.0602
4	50 - 50 / 100 - 50 =	0	5 - 2 / 85 - 2 =	0.0361
5	50 - 50 / 100 - 50 =	0	8 - 2 / 85 - 2 =	0.0722
6	50 - 50 / 100 - 50 =	0	6 - 2 / 85 - 2 =	0,0481
7	50 - 50 / 100 - 50 =	0	8 - 2 / 85 - 2 =	0,0722
8	50 - 50 / 100 - 50 =	0	13 - 2 / 85 - 2 =	0,1325
9	100 - 50 / 100 - 50 =	1	14 - 2 / 85 - 2 =	0,1445

10	50 - 50 / 100 - 50 =	0	14 - 2 / 8 5 - 2 =	0,1445
11	50 - 50 / 100 - 50 =	0	20 - 2 / 85 - 2 =	0,2168
12	50 - 50 / 100 - 50 =	0	21 - 2 /85 - 2 =	0,2289
13	50 - 50 / 100 - 50 =	0	28 - 2 / 85 - 2 =	0,3132
14	50 - 50 / 100 - 50 =	0	21 - 2 / 85 - 2 =	0,2289
15	50 - 50 / 100 - 50 =	0	40 - 2 / 85 - 2 =	0,4578
16	50 - 50 / 100 - 50 =	0	36 - 2 / 85 - 2 =	0,4096
17	50 - 50 / 100 - 50 =	0	11 - 2 / 85 - 2 =	0,1048
18	50 - 50 / 100 - 50 =	0	15 - 2 / 85 - 2 =	0,1566
19	50 - 50 / 100 - 50 =	0	20 - 2 / 85 - 2 =	0,2168
20	100 - 50 / 100 - 50 =	1	85 - 2 / 85 - 2 =	1
21	100 - 50 / 100 - 50 =	1	17 - 2 / 85 - 2 =	0,1807
22	50 - 50 / 100 - 50 =	0	2 - 2 / 85 - 2 =	0
23	100 - 50 / 100 - 50 =	1	26 - 2 / 85 - 2 =	0,2891
24	50 - 50 / 100 - 50 =	0	11 - 2 / 85 - 2 =	0,1048
25	50 - 50 / 100 - 50 =	0	11 - 2 / 85 - 2 =	0,1048
26	50 - 50 / 100 - 50 =	0	11 - 2 / 85 - 2 =	0,1048
27	100 - 50 / 100 - 50 =	1	13 - 2/ 85 - 2 =	0,1325
28	50 - 50 / 100 - 50 =	0	14 - 2 / 85 - 2 =	0,1445
29	50 - 50 / 100 - 50 =	0	5 - 2 / 85 - 2 =	0,0361
30	50 - 50 / 100 - 50 =	0	13 - 2 / 85 - 2=	0,1325
31	100 - 50 / 100 - 50 =	1	24 - 2 / 85 - 2 =	0,265
32	100 - 50 / 100 - 50 =	1	16 - 2 / 85 - 2 =	0,1686
33	50 - 50 /100 - 50 =	0	10 - 2 / 85 - 2 =	0.0963
34	50 - 50 / 100 - 50 =	0	13 - 2 / 85 - 2 =	0,1325
35	50 - 50 / 100 - 50 =	0	6 - 2 / 85 - 2 =	0,0481
36	50 - 50 / 100 - 50 =	0	35 - 2 / 85 - 2 =	0,3975
37	100 - 50 / 100 - 50 =	1	70 - 2 / 85 - 2 =	0,8192
38	50 - 50 / 100 - 50 =	0	16 - 2 / 85 - 2 =	0,1686
39	50 - 50 / 100 - 50 =	0	15 - 2 / 85 - 2 =	0,1566
40	50 - 50 / 100 - 50 =	0	10 - 2 / 85 - 2 =	0,0963
41	50 - 50 / 100 - 50 =	0	4 - 2 / 85 - 2 =	0,024
42	100 - 50 / 100 - 50 =	1	12 - 2 / 85 -2 =	0,1204
43	100 - 50 / 100 - 50 =	1	15 - 2 / 85 - 2 =	0,1566
44	50 - 50 / 100 - 50 =	0	6 - 2 / 85 - 2 =	0,0481
45	50 - 50 / 100 - 50 =	0	11 - 2 / 85 - 2 =	0,1048
46	50 - 50 / 100 - 50 =	0	7 - 2 / 85 - 2 =	0,0602
47	50 - 50 / 100 - 50 =	0	27 - 2 / 85 -2 =	0,3012
48	50 - 50 / 100 - 50 =	0	15 - 2 / 85 -2 =	0,1566
49	50 - 50 / 100 - 50 =	0	2 - 2 / 85 -2 =	0
50	50 - 50 / 100 - 50 =	0	15 - 2 / 85 -2 =	0,1566

3) Calculating the Euclidean distance is by determining the parameter k, calculating the distance between the testing data and the training data at the data transformation stage.

Table 4. Euclidean Distance Calculation Results

No.	Product name	Product Stock	Dolls Sold	Euclidean distance
1	Hello Kitty doll	100	65	$\sqrt{1-(0)^2+(0{,}759\ -0)^2}$= 1.3262
2	Spongebob doll	50	15	$\sqrt{0-(0)^2+(0{,}1566\ -0)^2}$= 0.1566
3	Mickey Mouse doll	50	7	$\sqrt{0-(0)^2+(0{,}0602\ -0)^2}$= 0.0602
4	Minnie Mouse Doll	50	5	$\sqrt{0-(0)^2+(0{,}0361\ -0)^2}$= 0.0361
5	Upin doll	50	8	$\sqrt{0-(0)^2+(0{,}0722\ -0)^2}$= 0.0722
6	Ipin doll	50	6	$\sqrt{0-(0)^2+(0{,}0481\ -0)^2}$= 0.0481
7	Smile Doll	50	8	$\sqrt{0-(0)^2+(0{,}0722\ -0)^2}$= 0.0722

8	Minion Dolls	50	13	$\sqrt{0-(0)^2+(0{,}1325-0)^2}$ = 0,1325
9	Donut Doll	100	14	$\sqrt{0-(0)^2+(0{,}1445-0)^2}$ = 1,0104
10	Winnie doll	50	14	$\sqrt{0-(0)^2+(0{,}1455-0)^2}$ = 0,1455
11	Panda doll	50	20	$\sqrt{0-(0)^2+(0{,}2168-0)^2}$ = 0,2168
12	Barbie doll	50	21	$\sqrt{0-(0)^2+(0{,}2289-0)^2}$ = 0,2289
13	Unicorn Doll	50	28	$\sqrt{0-(0)^2+(0{,}3132-0)^2}$ = 0,3132
14	LOL Dolls	50	21	$\sqrt{0-(0)^2+(0{,}2289-0)^2}$ = 0,2289
15	Teddy Bear	50	40	$\sqrt{0-(0)^2+(0{,}4578-0)^2}$ = 0,4578
16	Boba Doll	50	36	$\sqrt{0-(0)^2+(0{,}4096-0)^2}$ = 0,4096
17	Mcqueen doll	50	11	$\sqrt{0-(0)^2+(0{,}1048-0)^2}$ = 0,1048
18	Cropy Doll	50	15	$\sqrt{0-(0)^2+(0{,}1566-0)^2}$ = 0,1566
19	Pororo doll	50	20	$\sqrt{0-(0)^2+(0{,}2168-0)^2}$ = 0,2168
20	Doraemon doll	100	85	$\sqrt{1-(0)^2+(1-0)^2}$ = 1,4142
21	Pig Doll	100	17	$\sqrt{1-(0)^2+(0,,1807-0)^2}$ = 1,0161
22	Snoopy doll	50	2	$\sqrt{0-(0)^2+(0-0)^2}$ = 0
23	Rabbit Doll	100	26	$\sqrt{1-(0)^2+(0,\ 2891-0)^2}$ = 1,0409
24	Crocodile Doll	50	11	$\sqrt{0-(0)^2+(0{,}1048-0)^2}$ = 0,1048
25	Duck doll	50	11	$\sqrt{0-(0)^2+(0{,}1048-0)^2}$ = 0,1048
26	Sheep Doll	50	11	$\sqrt{0-(0)^2+(0{,}1048-0)^2}$ = 0,1048
M, 27	Cow Doll	100	13	$\sqrt{1-(0)^2+(0{,}1325-0)^2}$ = 1,0087
28	Baby Elephant Doll	50	14	$\sqrt{0-(0)^2+(0{,}1455-0)^2}$ = 0,1455
29	Monkey Puppet	50	5	$\sqrt{0-(0)^2+(0{,}0361-0)^2}$ = 0,0361
30	Marsha Doll	50	13	$\sqrt{0-(0)^2+(0{,}1325-0)^2}$ = 0,1325
31	Love Doll	100	24	$\sqrt{1-(0)^2+(0{,}265-0)^2}$ = 1,0345
32	Stitch Doll	100	16	$\sqrt{1-(0)^2+(0{,}1686-0)^2}$ = 1,0141
33	Pokemon Dolls	50	10	$\sqrt{0-(0)^2+(0{,}0963-0)^2}$ = 0,0963
34	Petrick Doll	50	13	$\sqrt{0-(0)^2+(0{,}1325-0)^2}$ = 0,1325
35	Dino Doll	50	6	$\sqrt{0-(0)^2+(0,\ 0481-0)^2}$ = 0,0481
36	Cinnamoro doll	50	35	$\sqrt{0-(0)^2+(0{,}3975-0)^2}$ = 0,3975
37	Graduation Doll	100	70	$\sqrt{1-(0)^2+(0,\ 8192-0)^2}$ = 1,2926
38	Paint Doll	50	16	$\sqrt{0-(0)^2+(0{,}1686-0)^2}$ = 0,1686
39	Candy Doll	50	15	$\sqrt{0-(0)^2+(0{,}1566-0)^2}$ = 0,1566
40	Tiger doll	50	10	$\sqrt{0-(0)^2+(0{,}0963-0)^2}$ = 0,0963
41	Lion doll	50	4	$\sqrt{0-(0)^2+(0{,}579-0)^2}$= 1.1581
42	Hamster Doll	100	12	$\sqrt{1-(0)^2+(0{,}1204-0)^2}$ = 1,058
43	Character Sofa Doll	100	15	$\sqrt{1-(0)^2+(0{,}566-0)^2}$ = 1,0075
44	Yum-Yum Pillow Doll	50	6	$\sqrt{0-(0)^2+(0{,}0481-0)^2}$ = 0,0481

45	Ball Puppet	50	11	$\sqrt{0-(0)^2+(0{,}1048-0)^2}$= 0,1048
46	Bird doll	50	7	$\sqrt{0-(0)^2+(0{,}0602-0)^2}$ = 0,0602
47	Totoro doll	50	27	$\sqrt{0-(0)^2+(0{,}579-0)^2}$ = 0,579
48	Boboboy doll	50	15	$\sqrt{0-(0)^2+(0{,}3012-0)^2}$ = 0,3012
49	Bobo Doll	50	2	$\sqrt{0-(0)^2+(0,\ -0)^2}$ = 0
50	Giraffe Plush	50	15	$\sqrt{0-(0)^2+(0{,}1566\ -0)^2}$= 0.1566

4) Sort the results ascending, namely from high to low

Table 5. Ascending Data

No.	Product name	Euclidean Distance	Rank
1	Hello Kitty doll	$\sqrt{1-(0)^2+(0{,}759\ -0)^2}$ = 1.1544	3
2	Spongebob doll	$\sqrt{0-(0)^2+(0{,}1566\ -0)^2}$ = 0.1566	23
3	Mickey Mouse doll	$\sqrt{0-(0)^2+(0{,}0602\ -0)^2}$ = 0.0602	42
4	Minnie Mouse Doll	$\sqrt{0-(0)^2+(0{,}0361\ -0)^2}$ = 0.0361	47
5	Upin doll	$\sqrt{0-(0)^2+(0{,}0722\ -0)^2}$ = 0.0722	40
6	Ipin doll	$\sqrt{0-(0)^2+(0{,}0481\ -0)^2}$ = 0.0481	44
7	Smile Doll	$\sqrt{0-(0)^2+(0{,}0722\ -0)^2}$ = 0.0722	41
8	Minion Dolls	$\sqrt{0-(0)^2+(0{,}1325\ -0)^2}$ = 0,1325	30
9	Donut Doll	$\sqrt{1-(0)^2+(0{,}1445\ -0)^2}$ = 1,0104	9
10	Winnie doll	$\sqrt{0-(0)^2+(0{,}1455-0)^2}$ = 0,1455	28
11	Panda doll	$\sqrt{0-(0)^2+(0{,}2168\ -0)^2}$ = 0,2168	20
12	Barbie doll	$\sqrt{0-(0)^2+(0{,}2168\ -0)^2}$ = 0,2168	18
13	Unicorn Doll	$\sqrt{0-(0)^2+(0{,}2289\ -0)^2}$ = 0,2289	16
14	LOL Dolls	$\sqrt{0-(0)^2+(0{,}3132\ -0)^2}$ = 0,3132	199
15	Teddy Bear	$\sqrt{0-(0)^2+(0{,}2289\ -0)^2}$ = 0,2289	13
16	Boba Doll	$\sqrt{0-(0)^2+(0{,}4578\ -0)^2}$ = 0,4578	14
17	Mcqueen doll	$\sqrt{0-(0)^2+(0{,}4096\ -0)^2}$ = 0,4096	33
18	Cropy Doll	$\sqrt{0-(0)^2+(0{,}1048\ -\ 0)^2}$ = 0,1048	24
19	Pororo doll	$\sqrt{0-(0)^2+(0{,}1566\ -0)^2}$ = 0,1566	21
20	Doraemon doll	$\sqrt{1-(0)^2+(1\ -0)^2}$ = 1,4142	1
21	Pig Doll	$\sqrt{1-(0)^2+(0,,1807\ -0)^2}$ = 1,0161	7
22	Snoopy doll	$\sqrt{0-(0)^2+(0-0)^2}$ = 0	49
23	Rabbit Doll	$\sqrt{1-(0)^2+(0,\ 2891-0)^2}$ = 1,0409	5
24	Crocodile Doll	$\sqrt{0-(0)^2+(0{,}1048\ -0)^2}$ = 0,1048	34
25	Duck doll	$\sqrt{0-(0)^2+(0{,}1048\ -0)^2}$ = 0,1048	35
26	Sheep Doll	$\sqrt{0-(0)^2+(0{,}1048\ -0)^2}$ = 0,1048	36
27	Cow Doll	$\sqrt{1-(0)^2+(0{,}1325\ -0)^2}$ = 1,0087	10

28	Baby Elephant Doll	$\sqrt{0-(0)^2+(0{,}1455\ -0)^2}$ = 0,1455	29
29	Monkey Puppet	$\sqrt{0-(0)^2+(0{,}0361\ -0)^2}$ = 0,0361	48
30	Marsha Doll	$\sqrt{0-(0)^2+(0{,}1325\ -0)^2}$ = 0,1325	31
31	Love Doll	$\sqrt{1-(0)^2+(0{,}265\ -0)^2}$ = 1,0345	6
32	Stitch Doll	$\sqrt{1-(0)^2+(0{,}1686\ -0)^2}$ = 1,0141	8
33	Pokemon Dolls	$\sqrt{0-(0)^2+(0{,}0963\ -0)^2}$ = 0,0963	38
34	Petrick Doll	$\sqrt{0-(0)^2+(0{,}1325\ -0)^2}$ = 0,1325	32
35	Dino Doll	$\sqrt{0-(0)^2+(0,\ 0481-0)^2}$ = 0,0481	45
36	Cinnamoro doll	$\sqrt{0-(0)^2+(0{,}3975\ -0)^2}$ = 0,3975	15
37	Graduation Doll	$\sqrt{1-(0)^2+(0,\ 8192-0)^2}$ = 1,2926	2
38	Paint Doll	$\sqrt{0-(0)^2+(0{,}1686\ -0)^2}$ = 0,1686	22
39	Candy Doll	$\sqrt{0-(0)^2+(0{,}1566\ -0)^2}$ = 0,1566	25
40	Tiger doll	$\sqrt{0-(0)^2+(0{,}0963\ -0)^2}$ = 0,0963	39
41	Lion doll	$\sqrt{0-(0)^2+(0{,}024\ -0)^2}$= 0024	12
42	Hamster Doll	$\sqrt{1-(0)^2+(0{,}1204-0)^2}$ = 1,058	4
43	Character Sofa Doll	$\sqrt{1-(0)^2+(0{,}566\ -0)^2}$ = 1,0075	11
44	Yum-Yum Pillow Doll	$\sqrt{0-(0)^2+(0{,}0481\ -0)^2}$ = 0,0481	46
45	Ball Puppet	$\sqrt{0-(0)^2+(0{,}1048-0)^2}$= 0,1048	37
46	Bird doll	$\sqrt{0-(0)^2+(0{,}0602-0)^2}$ = 0,0602	43
47	Totoro doll	$\sqrt{0-(0)^2+(0{,}579-0)^2}$= 0,579	17
48	Boboboy doll	$\sqrt{0-(0)^2+(0{,}3012-0)^2}$= 0,3012	25
49	Bobo Doll	$\sqrt{0-(0)^2+(0,\ -0)^2}$= 0	50
50	Giraffe Plush	$\sqrt{0-(0)^2+(0{,}1566\ -0)^2}$= 0.1566	26

5) Determining the results of testing data from k where the value k = 3 is taken, the sales results for the best-selling doll with a value of 1.4142 are Doraemon dolls.

4. CONCLUSION

Based on the results of data calculated using K-Nearest Neighbor, the doll that people are most interested in at the Chudalla Store is Doraemon doll.

References

[1] S. P. Dewi, Nurwati and E. Rahayu, "Penerapan Data MiningUntuk Prediksi Penjualan Produk Terlaris Menggunakan Metode K-Nearest Neighbor," *Building of Informatics, Technology and Science (BITS)* , vol. Volume.3 Nomor.4, p. 639−648, 2022.

[2] I. Yolanda and H. Fahmi, "Penerapan Data Mining Untuk Prediksi Penjualan Produk Roti Terlaris Pada PT.Nippon Indosari Corpindo Tbk Menggunakan Metode K-Nearest Neighbor," *JIKOMSI [Jurnal Ilmu Komputer dan Sistem Informasi]*, vol. Volume.3 Nomor.3, pp. 9-15, 2021.

[3] A. U. Haspriyanti and P. W. Prasetyaningrum, "Penerapan Data Mining Untuk Prediksi Layanan Produk Indihome Menggunakan Metode K-Nearst Neighbor," *JURNAL INFORMATION SYSTEM & ARTIFICIAL INTELLIGENCE*, vol. Volume 1, pp. 100-107, 2021.

[4] Rismala, I. Ali and A. R. Rinaldi, "PENERAPAN METODE K-NEAREST NEIGHBOR UNTUK PREDIKSI PENJUALAN SEPEDA MOTOR TERLARIS," *JATI (Jurnal Mahasiswa Teknik Informatika)*, vol. Volume.7 No.1, pp. 585-590, 2023.

[5] C. Anisa and Andri, "PENERAPAN ALGORITMA K-NEAREST NEIGHBOR UNTUK PREDIKSI PENJUALAN OBAT PADA APOTEK KIMIA FARMA ATMO PALEMBANG," *Bina Darma Conference on Computer Science*, pp. 199-208, 2020.

[6] A. Pratama, B. S. Ginting and Nurhayati, "PENERAPAN DATA MINING UNTUK PREDIKSI MEREK PAKAIAN YANG PALING DIMINATI DENGAN METODE K-NEAREST NEIGHBOR (STUDI KASUS : PT. MATAHARI DEPARTEMENT STORE BINJAI)," *Jurnal Pancabudi*, vol. 14 No.2, pp. 54-64, 2021.