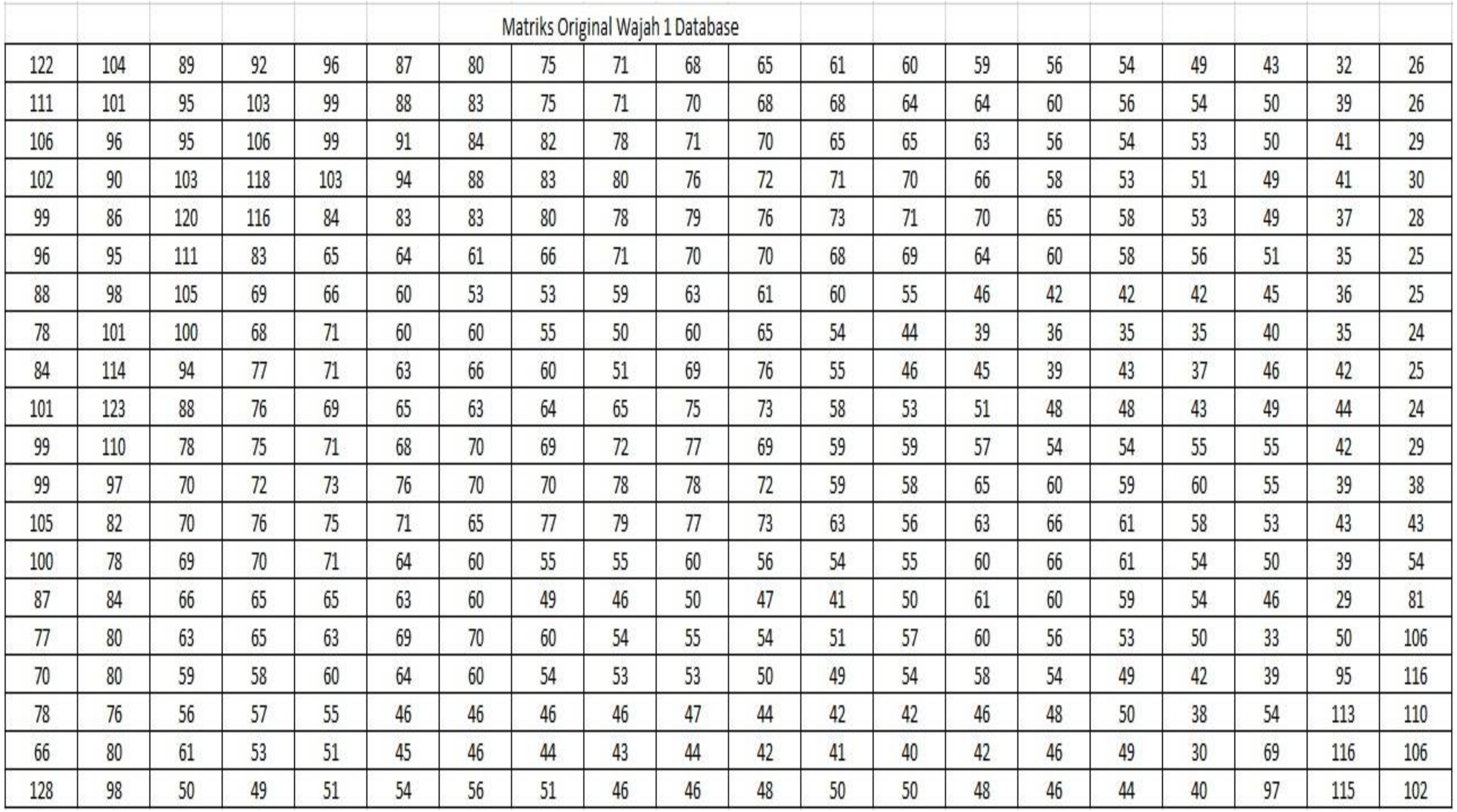
LAMPIRAN

Lampiran 1 matriks citra wajah *original* dan matriks *histogram* citra wajah



							Matriks Original Wajah 1 Database												
122	104	89	92	96	87	80	75	71	68	65	61	60	59	56	54	49	43	32	26
111	101	95	103	99	88	83	75	71	70	68	68	64	64	60	56	54	50	39	26
106	96	95	106	99	91	84	82	78	71	70	65	65	63	56	54	53	50	41	29
102	90	103	118	103	94	88	83	80	76	72	71	70	66	58	53	51	49	41	30
99	86	120	116	84	83	83	80	78	79	76	73	71	70	65	58	53	49	37	28
96	95	111	83	65	64	61	66	71	70	70	68	69	64	60	58	56	51	35	25
88	98	105	69	66	60	53	53	59	63	61	60	55	46	42	42	42	45	36	25
78	101	100	68	71	60	60	55	50	60	65	54	44	39	36	35	35	40	35	24
84	114	94	77	71	63	66	60	51	69	76	55	46	45	39	43	37	46	42	25
101	123	88	76	69	65	63	64	65	75	73	58	53	51	48	48	43	49	44	24
99	110	78	75	71	68	70	69	72	77	69	59	59	57	54	54	55	55	42	29
99	97	70	72	73	76	70	70	78	78	72	59	58	65	60	59	60	55	39	38
105	82	70	76	75	71	65	77	79	77	73	63	56	63	66	61	58	53	43	43
100	78	69	70	71	64	60	55	55	60	56	54	55	60	66	61	54	50	39	54
87	84	66	65	65	63	60	49	46	50	47	41	50	61	60	59	54	46	29	81
77	80	63	65	63	69	70	60	54	55	54	51	57	60	56	53	50	33	50	106
70	80	59	58	60	64	60	54	53	53	50	49	54	58	54	49	42	39	95	116
78	76	56	57	55	46	46	46	46	47	44	42	42	46	48	50	38	54	113	110
66	80	61	53	51	45	46	44	43	44	42	41	40	42	46	49	30	69	116	106
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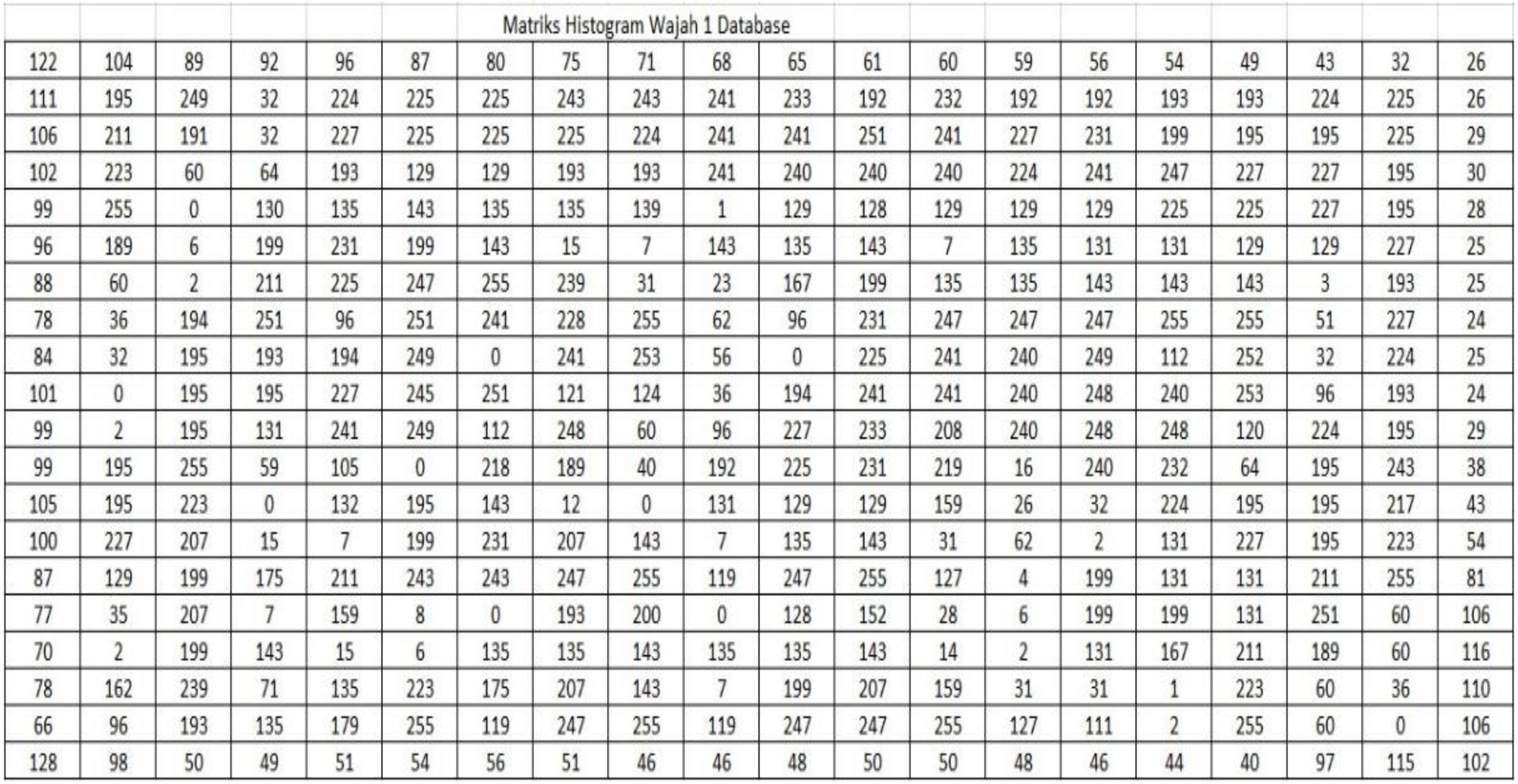
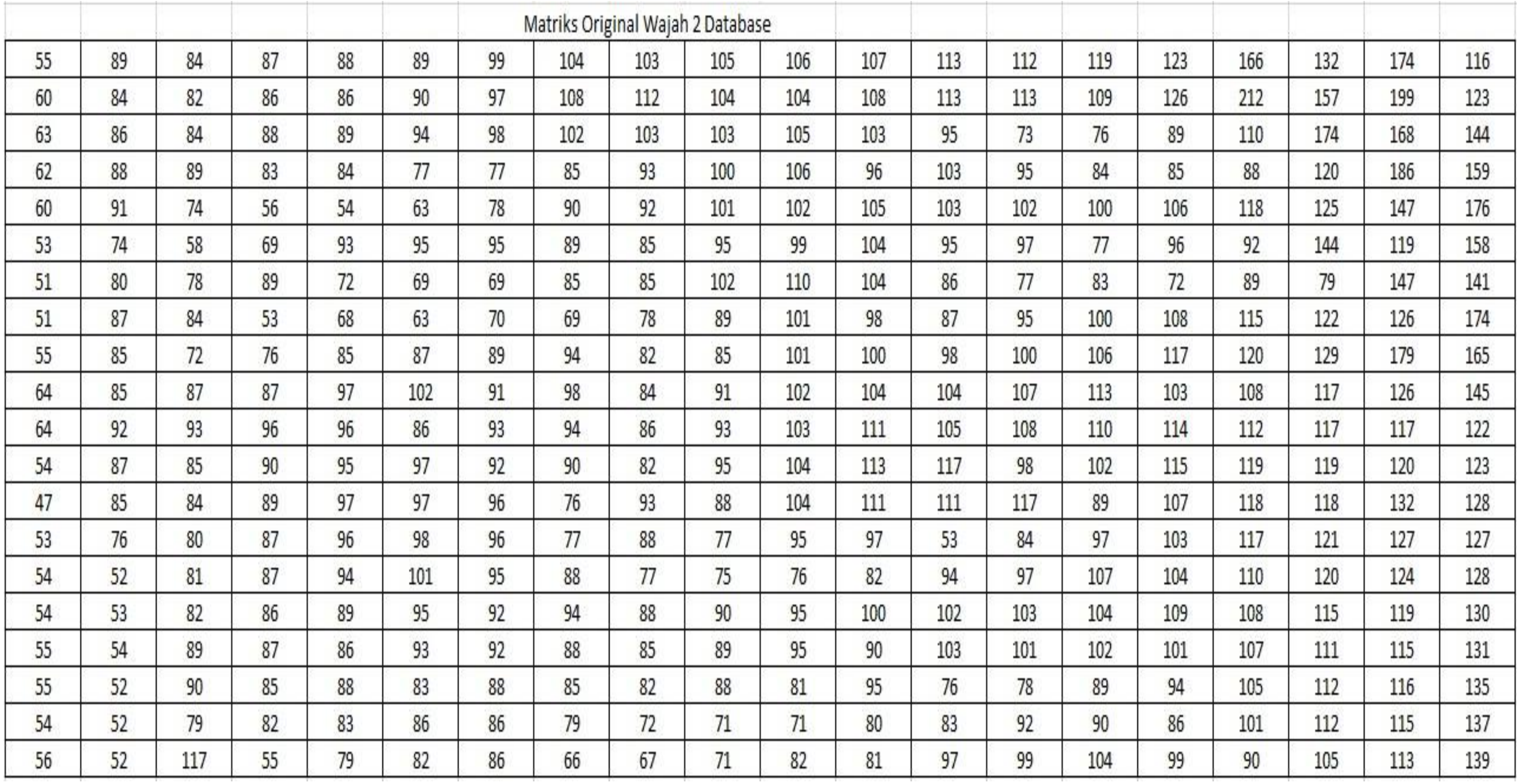


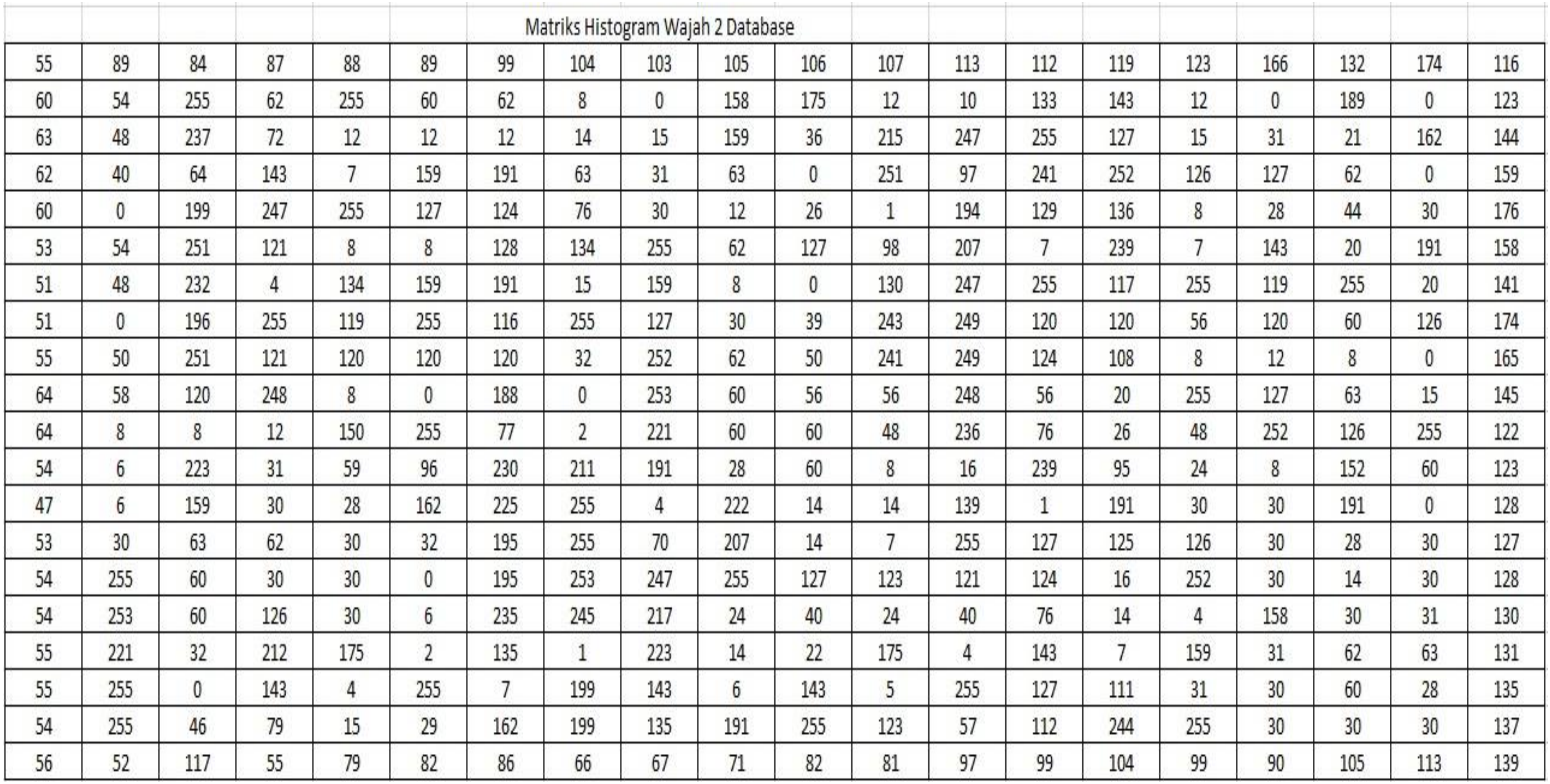
Matriks Histogram Wajah 1 Database

122	104	89	92	96	87	80	75	71	68	65	61	60	59	56	54	49	43	32	26
111	195	249	32	224	225	225	243	243	241	233	192	232	192	192	193	193	224	225	26
106	211	191	32	227	225	225	225	224	241	241	251	241	227	231	199	195	195	225	29
102	223	60	64	193	129	129	193	193	241	240	240	240	224	241	247	227	227	195	30
99	255	0	130	135	143	135	135	139	1	129	128	129	129	129	225	225	227	195	28
96	189	6	199	231	199	143	15	7	143	135	143	7	135	131	131	129	129	227	25
88	60	2	211	225	247	255	239	31	23	167	199	135	135	143	143	143	3	193	25
78	36	194	251	96	251	241	228	255	62	96	231	247	247	247	255	255	51	227	24
84	32	195	193	194	249	0	241	253	56	0	225	241	240	249	112	252	32	224	25
101	0	195	195	227	245	251	121	124	36	194	241	241	240	248	240	253	96	193	24
99	2	195	131	241	249	112	248	60	96	227	233	208	240	248	248	120	224	195	29
99	195	255	59	105	0	218	189	40	192	225	231	219	16	240	232	64	195	243	38
105	195	223	0	132	195	143	12	0	131	129	129	159	26	32	224	195	195	217	43
100	227	207	15	7	199	231	207	143	7	135	143	31	62	2	131	227	195	223	54
87	129	199	175	211	243	243	247	255	119	247	255	127	4	199	131	131	211	255	81
77	35	207	7	159	8	0	193	200	0	128	152	28	6	199	199	131	251	60	106
70	2	199	143	15	6	135	135	143	135	135	143	14	2	131	167	211	189	60	116
78	162	239	71	135	223	175	207	143	7	199	207	159	31	31	1	223	60	36	110
66	96	193	135	179	255	119	247	255	119	247	247	255	127	111	2	255	60	0	106
128	98	50	49	51	54	56	51	46	46	48	50	50	48	46	44	40	97	115	102



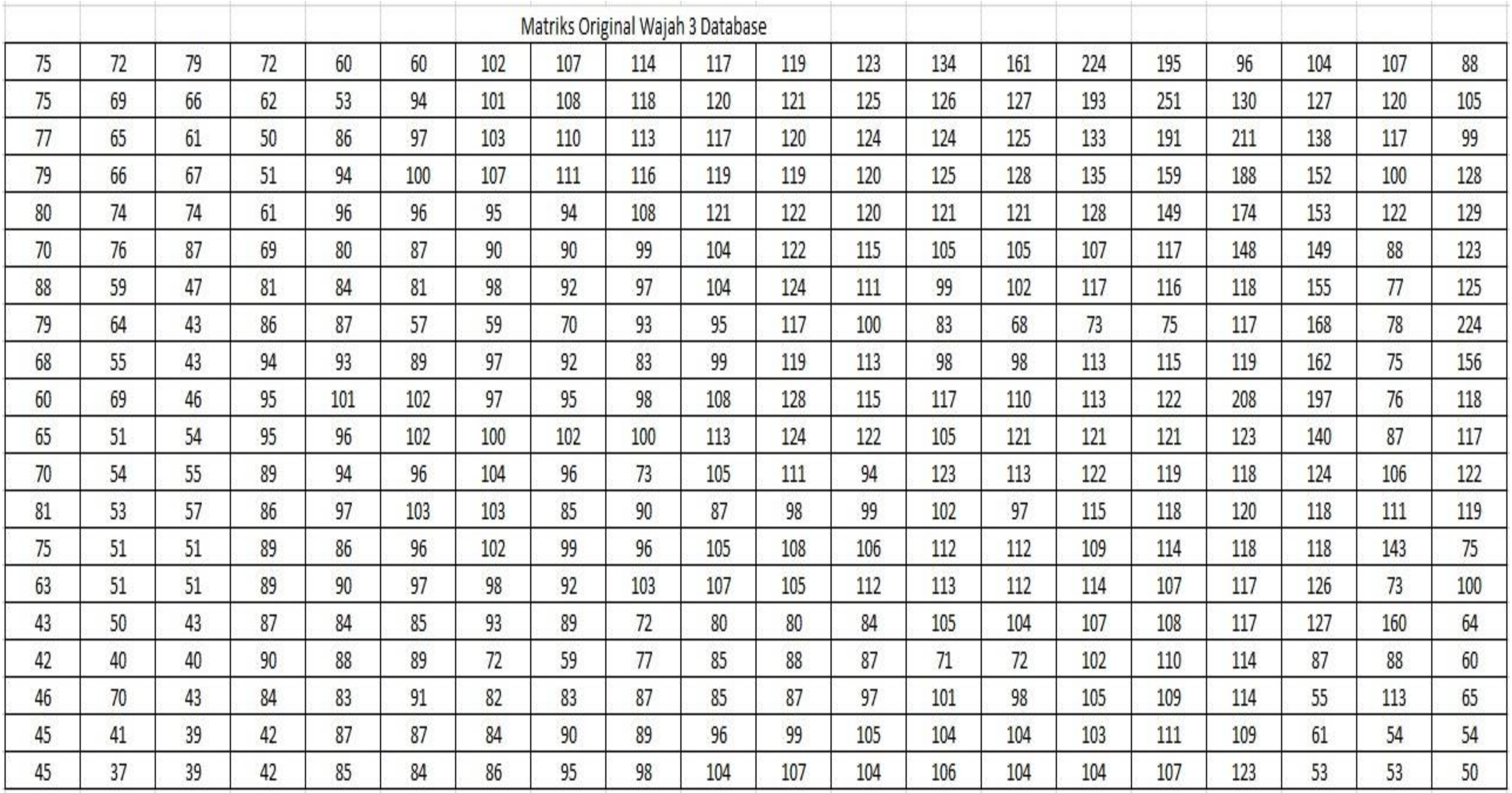
Matriks Original Wajah 2 Database

55	89	84	87	88	89	99	104	103	105	106	107	113	112	119	123	166	132	174	116
60	84	82	86	86	90	97	108	112	104	104	108	113	113	109	126	212	157	199	123
63	86	84	88	89	94	98	102	103	103	105	103	95	73	76	89	110	174	168	144
62	88	89	83	84	77	77	85	93	100	106	96	103	95	84	85	88	120	186	159
60	91	74	56	54	63	78	90	92	101	102	105	103	102	100	106	118	125	147	176
53	74	58	69	93	95	95	89	85	95	99	104	95	97	77	96	92	144	119	158
51	80	78	89	72	69	69	85	85	102	110	104	86	77	83	72	89	79	147	141
51	87	84	53	68	63	70	69	78	89	101	98	87	95	100	108	115	122	126	174
55	85	72	76	85	87	89	94	82	85	101	100	98	100	106	117	120	129	179	165
64	85	87	87	97	102	91	98	84	91	102	104	104	107	113	103	108	117	126	145
64	92	93	96	96	86	93	94	86	93	103	111	105	108	110	114	112	117	117	122
54	87	85	90	95	97	92	90	82	95	104	113	117	98	102	115	119	119	120	123
47	85	84	89	97	97	96	76	93	88	104	111	111	117	89	107	118	118	132	128
53	76	80	87	96	98	96	77	88	77	95	97	53	84	97	103	117	121	127	127
54	52	81	87	94	101	95	88	77	75	76	82	94	97	107	104	110	120	124	128
54	53	82	86	89	95	92	94	88	90	95	100	102	103	104	109	108	115	119	130
55	54	89	87	86	93	92	88	85	89	95	90	103	101	102	101	107	111	115	131
55	52	90	85	88	83	88	85	82	88	81	95	76	78	89	94	105	112	116	135
54	52	79	82	83	86	86	79	72	71	71	80	83	92	90	86	101	112	115	137
56	52	117	55	79	82	86	66	67	71	82	81	97	99	104	99	90	105	113	139



Matriks Histogram Wajah 2 Database

55	89	84	87	88	89	99	104	103	105	106	107	113	112	119	123	166	132	174	116
60	54	255	62	255	60	62	8	0	158	175	12	10	133	143	12	0	189	0	123
63	48	237	72	12	12	12	14	15	159	36	215	247	255	127	15	31	21	162	144
62	40	64	143	7	159	191	63	31	63	0	251	97	241	252	126	127	62	0	159
60	0	199	247	255	127	124	76	30	12	26	1	194	129	136	8	28	44	30	176
53	54	251	121	8	8	128	134	255	62	127	98	207	7	239	7	143	20	191	158
51	48	232	4	134	159	191	15	159	8	0	130	247	255	117	255	119	255	20	141
51	0	196	255	119	255	116	255	127	30	39	243	249	120	120	56	120	60	126	174
55	50	251	121	120	120	120	32	252	62	50	241	249	124	108	8	12	8	0	165
64	58	120	248	8	0	188	0	253	60	56	56	248	56	20	255	127	63	15	145
64	8	8	12	150	255	77	2	221	60	60	48	236	76	26	48	252	126	255	122
54	6	223	31	59	96	230	211	191	28	60	8	16	239	95	24	8	152	60	123
47	6	159	30	28	162	225	255	4	222	14	14	139	1	191	30	30	191	0	128
53	30	63	62	30	32	195	255	70	207	14	7	255	127	125	126	30	28	30	127
54	255	60	30	30	0	195	253	247	255	127	123	121	124	16	252	30	14	30	128
54	253	60	126	30	6	235	245	217	24	40	24	40	76	14	4	158	30	31	130
55	221	32	212	175	2	135	1	223	14	22	175	4	143	7	159	31	62	63	131
55	255	0	143	4	255	7	199	143	6	143	5	255	127	111	31	30	60	28	135
54	255	46	79	15	29	162	199	135	191	255	123	57	112	244	255	30	30	30	137
56	52	117	55	79	82	86	66	67	71	82	81	97	99	104	99	90	105	113	139



Matriks Original Wajah 3 Database

75	72	79	72	60	60	102	107	114	117	119	123	134	161	224	195	96	104	107	88
75	69	66	62	53	94	101	108	118	120	121	125	126	127	193	251	130	127	120	105
77	65	61	50	86	97	103	110	113	117	120	124	124	125	133	191	211	138	117	99
79	66	67	51	94	100	107	111	116	119	119	120	125	128	135	159	188	152	100	128
80	74	74	61	96	96	95	94	108	121	122	120	121	121	128	149	174	153	122	129
70	76	87	69	80	87	90	90	99	104	122	115	105	105	107	117	148	149	88	123
88	59	47	81	84	81	98	92	97	104	124	111	99	102	117	116	118	155	77	125
79	64	43	86	87	57	59	70	93	95	117	100	83	68	73	75	117	168	78	224
68	55	43	94	93	89	97	92	83	99	119	113	98	98	113	115	119	162	75	156
60	69	46	95	101	102	97	95	98	108	128	115	117	110	113	122	208	197	76	118
65	51	54	95	96	102	100	102	100	113	124	122	105	121	121	121	123	140	87	117
70	54	55	89	94	96	104	96	73	105	111	94	123	113	122	119	118	124	106	122
81	53	57	86	97	103	103	85	90	87	98	99	102	97	115	118	120	118	111	119
75	51	51	89	86	96	102	99	96	105	108	106	112	112	109	114	118	118	143	75
63	51	51	89	90	97	98	92	103	107	105	112	113	112	114	107	117	126	73	100
43	50	43	87	84	85	93	89	72	80	80	84	105	104	107	108	117	127	160	64
42	40	40	90	88	89	72	59	77	85	88	87	71	72	102	110	114	87	88	60
46	70	43	84	83	91	82	83	87	85	87	97	101	98	105	109	114	55	113	65
45	41	39	42	87	87	84	90	89	96	99	105	104	104	103	111	109	61	54	54
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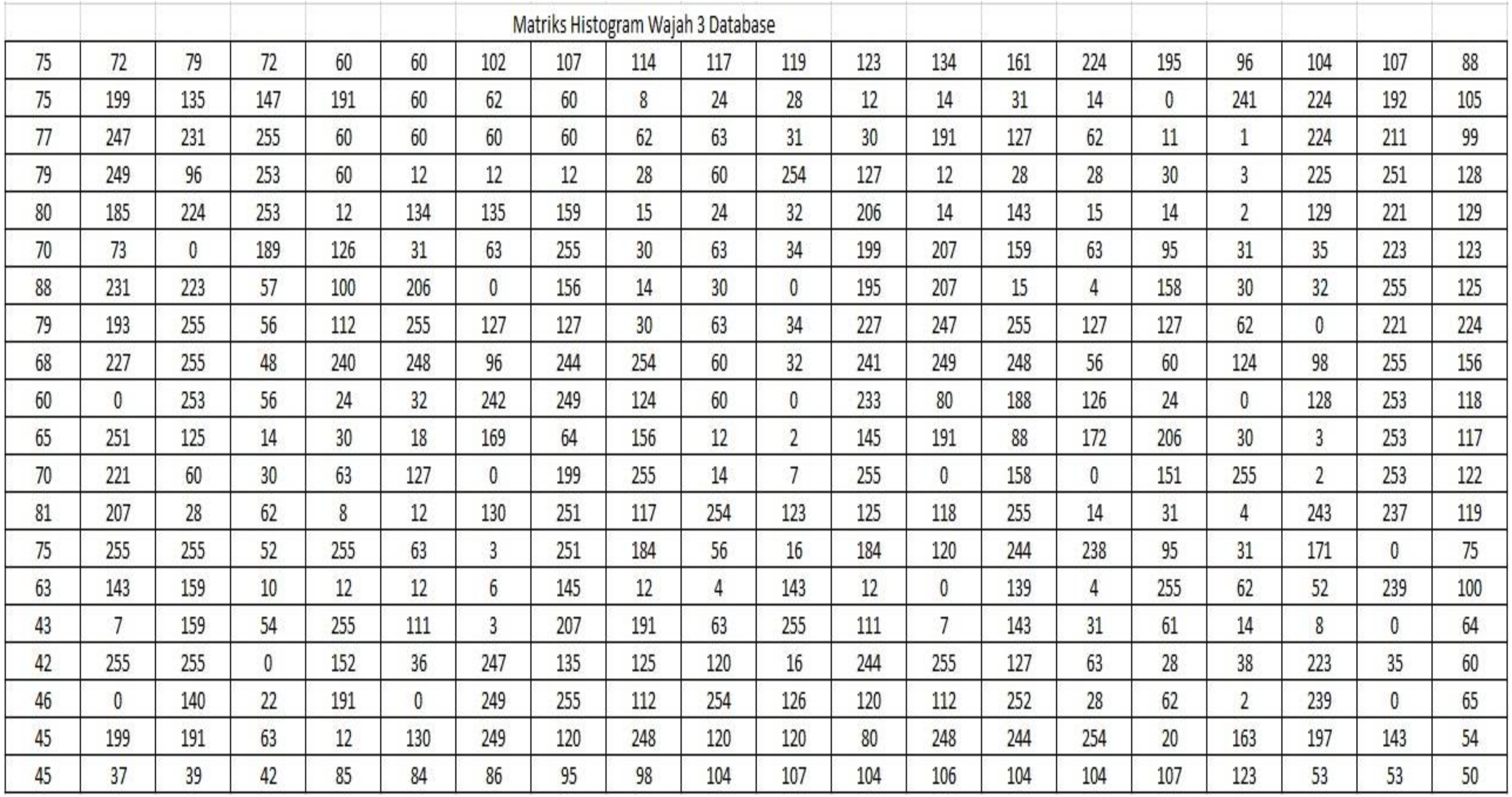
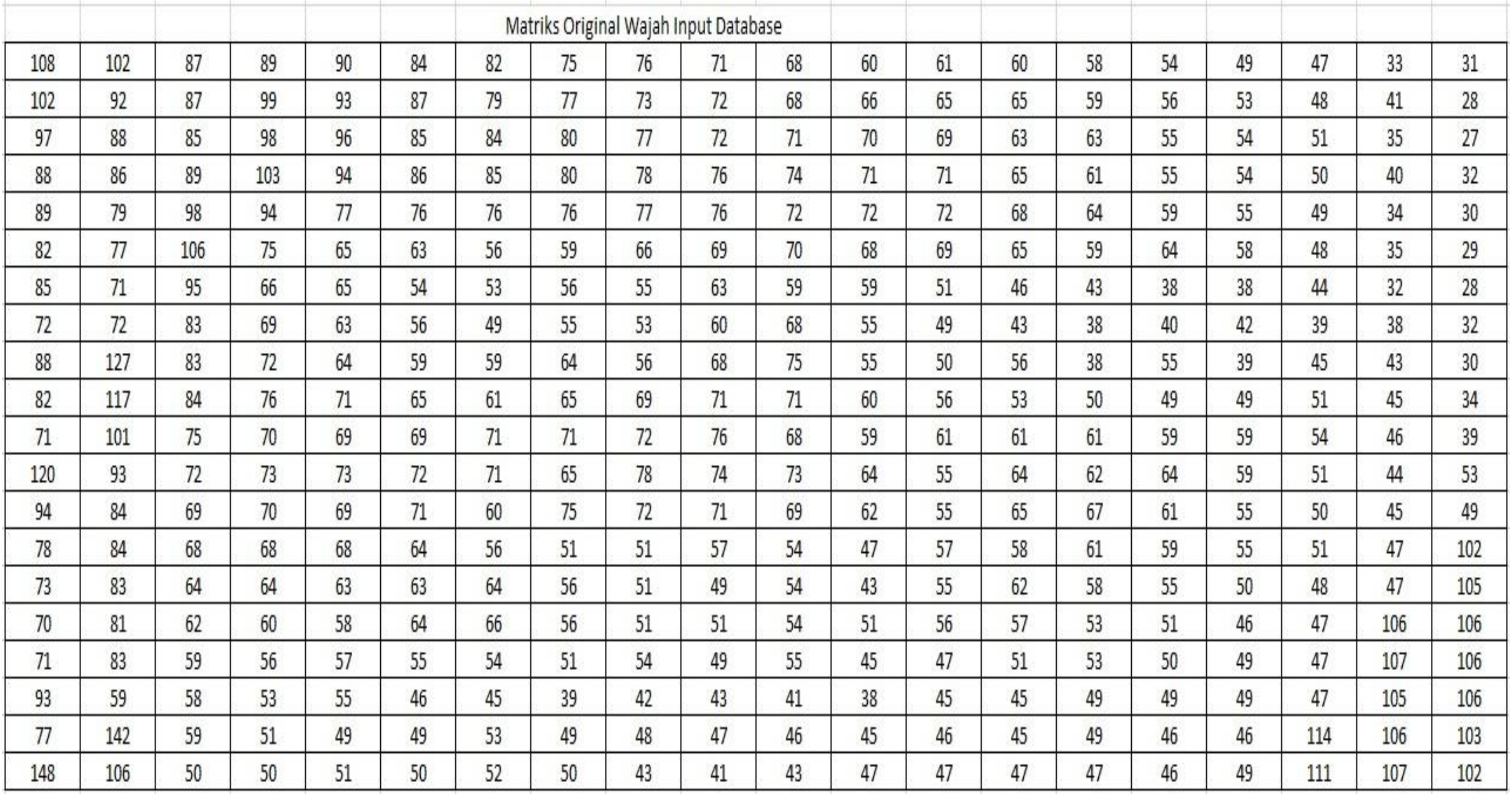


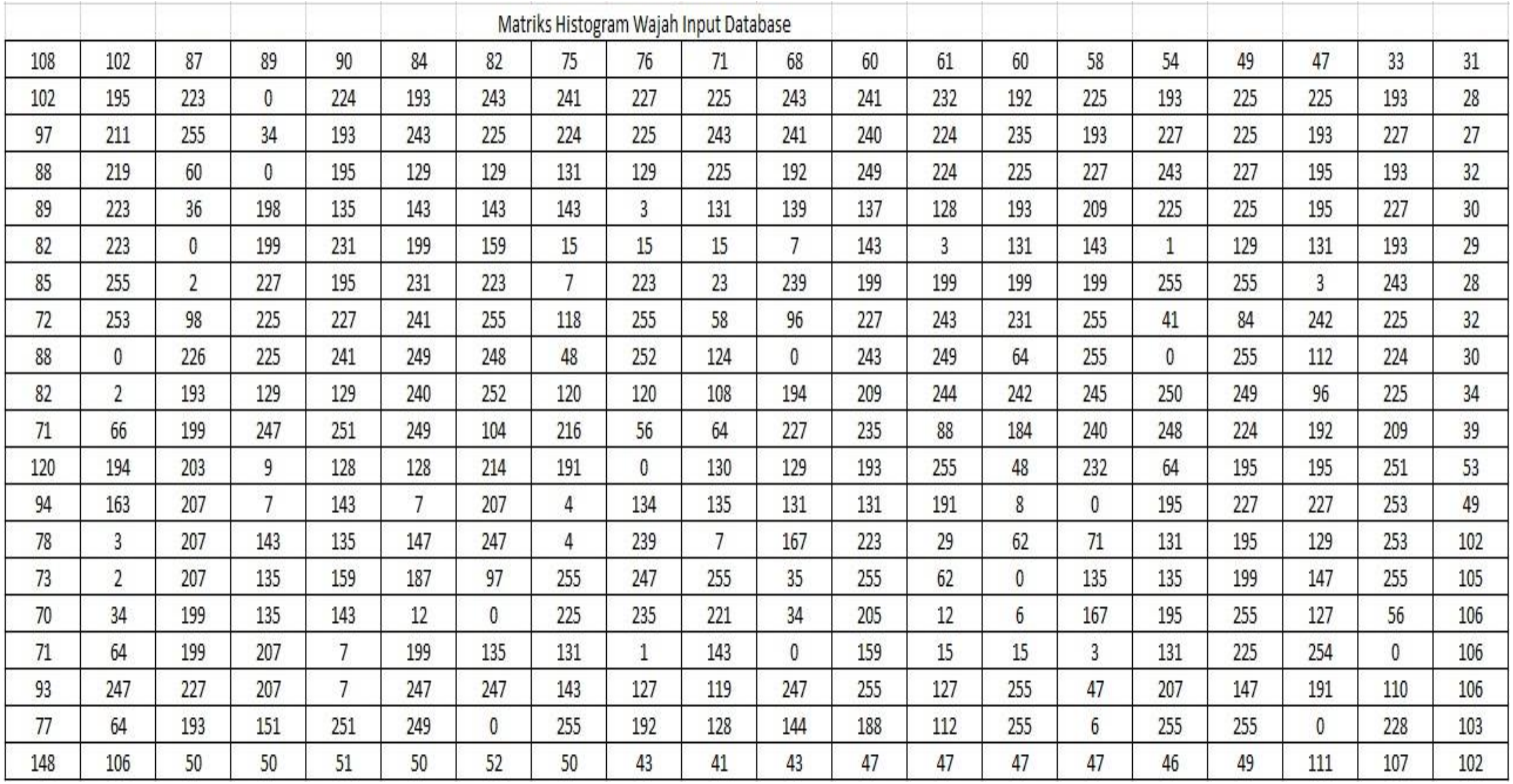
Matriks Histogram Wajah 3 Database

75	72	79	72	60	60	102	107	114	117	119	123	134	161	224	195	96	104	107	88
75	199	135	147	191	60	62	60	8	24	28	12	14	31	14	0	241	224	192	105
77	247	231	255	60	60	60	60	62	63	31	30	191	127	62	11	1	224	211	99
79	249	96	253	60	12	12	12	28	60	254	127	12	28	28	30	3	225	251	128
80	185	224	253	12	134	135	159	15	24	32	206	14	143	15	14	2	129	221	129
70	73	0	189	126	31	63	255	30	63	34	199	207	159	63	95	31	35	223	123
88	231	223	57	100	206	0	156	14	30	0	195	207	15	4	158	30	32	255	125
79	193	255	56	112	255	127	127	30	63	34	227	247	255	127	127	62	0	221	224
68	227	255	48	240	248	96	244	254	60	32	241	249	248	56	60	124	98	255	156
60	0	253	56	24	32	242	249	124	60	0	233	80	188	126	24	0	128	253	118
65	251	125	14	30	18	169	64	156	12	2	145	191	88	172	206	30	3	253	117
70	221	60	30	63	127	0	199	255	14	7	255	0	158	0	151	255	2	253	122
81	207	28	62	8	12	130	251	117	254	123	125	118	255	14	31	4	243	237	119
75	255	255	52	255	63	3	251	184	56	16	184	120	244	238	95	31	171	0	75
63	143	159	10	12	12	6	145	12	4	143	12	0	139	4	255	62	52	239	100
43	7	159	54	255	111	3	207	191	63	255	111	7	143	31	61	14	8	0	64
42	255	255	0	152	36	247	135	125	120	16	244	255	127	63	28	38	223	35	60
46	0	140	22	191	0	249	255	112	254	126	120	112	252	28	62	2	239	0	65
45	199	191	63	12	130	249	120	248	120	120	80	248	244	254	20	163	197	143	54
45	37	39	42	85	84	86	95	98	104	107	104	106	104	104	107	123	53	53	50



Matriks Original Wajah Input Database

108	102	87	89	90	84	82	75	76	71	68	60	61	60	58	54	49	47	33	31
102	92	87	99	93	87	79	77	73	72	68	66	65	65	59	56	53	48	41	28
97	88	85	98	96	85	84	80	77	72	71	70	69	63	63	55	54	51	35	27
88	86	89	103	94	86	85	80	78	76	74	71	71	65	61	55	54	50	40	32
89	79	98	94	77	76	76	76	77	76	72	72	72	68	64	59	55	49	34	30
82	77	106	75	65	63	56	59	66	69	70	68	69	65	59	64	58	48	35	29
85	71	95	66	65	54	53	56	55	63	59	59	51	46	43	38	38	44	32	28
72	72	83	69	63	56	49	55	53	60	68	55	49	43	38	40	42	39	38	32
88	127	83	72	64	59	59	64	56	68	75	55	50	56	38	55	39	45	43	30
82	117	84	76	71	65	61	65	69	71	71	60	56	53	50	49	49	51	45	34
71	101	75	70	69	69	71	71	72	76	68	59	61	61	61	59	59	54	46	39
120	93	72	73	73	72	71	65	78	74	73	64	55	64	62	64	59	51	44	53
94	84	69	70	69	71	60	75	72	71	69	62	55	65	67	61	55	50	45	49
78	84	68	68	68	64	56	51	51	57	54	47	57	58	61	59	55	51	47	102
73	83	64	64	63	63	64	56	51	49	54	43	55	62	58	55	50	48	47	105
70	81	62	60	58	64	66	56	51	51	54	51	56	57	53	51	46	47	106	106
71	83	59	56	57	55	54	51	54	49	55	45	47	51	53	50	49	47	107	106
93	59	58	53	55	46	45	39	42	43	41	38	45	45	49	49	49	47	105	106
77	142	59	51	49	49	53	49	48	47	46	45	46	45	49	46	46	114	106	103
148	106	50	50	51	50	52	50	43	41	43	47	47	47	47	46	49	111	107	102



Matriks Histogram Wajah Input Database

108	102	87	89	90	84	82	75	76	71	68	60	61	60	58	54	49	47	33	31
102	195	223	0	224	193	243	241	227	225	243	241	232	192	225	193	225	225	193	28
97	211	255	34	193	243	225	224	225	243	241	240	224	235	193	227	225	193	227	27
88	219	60	0	195	129	129	131	129	225	192	249	224	225	227	243	227	195	193	32
89	223	36	198	135	143	143	143	3	131	139	137	128	193	209	225	225	195	227	30
82	223	0	199	231	199	159	15	15	15	7	143	3	131	143	1	129	131	193	29
85	255	2	227	195	231	223	7	223	23	239	199	199	199	199	255	255	3	243	28
72	253	98	225	227	241	255	118	255	58	96	227	243	231	255	41	84	242	225	32
88	0	226	225	241	249	248	48	252	124	0	243	249	64	255	0	255	112	224	30
82	2	193	129	129	240	252	120	120	108	194	209	244	242	245	250	249	96	225	34
71	66	199	247	251	249	104	216	56	64	227	235	88	184	240	248	224	192	209	39
120	194	203	9	128	128	214	191	0	130	129	193	255	48	232	64	195	195	251	53
94	163	207	7	143	7	207	4	134	135	131	131	191	8	0	195	227	227	253	49
78	3	207	143	135	147	247	4	239	7	167	223	29	62	71	131	195	129	253	102
73	2	207	135	159	187	97	255	247	255	35	255	62	0	135	135	199	147	255	105
70	34	199	135	143	12	0	225	235	221	34	205	12	6	167	195	255	127	56	106
71	64	199	207	7	199	135	131	1	143	0	159	15	15	3	131	225	254	0	106
93	247	227	207	7	247	247	143	127	119	247	255	127	255	47	207	147	191	110	106
77	64	193	151	251	249	0	255	192	128	144	188	112	255	6	255	255	0	228	103
148	106	50	50	51	50	52	50	43	41	43	47	47	47	47	46	49	111	107	102

Lampiran 2 Program main menu

```
#! /usr/bin/python3
import os
import check_camera
import Capture_Image
import Train_Image
import Recognize

def title_bar():
    os.system('clear')

    print("\t--------------------------------------------------")
    print("\t|    Presensi Berbasis Pemindai Wajah    |")
    print("\t|          Rumah Makan Mbak Dwi           |")
    print("\t--------------------------------------------------")

def mainMenu():
    title_bar()
    print()
    print(10 * "*", "PILIH MENU", 10 * "*")
    print("[1] Cek Kamera")
    print("[2] Daftar Pegawai Baru")
    print("[3] Train Gambar")
    print("[4] Presensi masuk secara real-time")
    print("[5] Keluar")

    while True:
        try:
            choice = int(input("Masukkan pilihan: "))

            if choice == 1:
                checkCamera()
                break
            elif choice == 2:
                CaptureFaces()
                break
            elif choice == 3:
                Trainimages()
                break
            elif choice == 4:
                RecognizeFaces()
                break
            elif choice == 5:
                print("Sampai Jumpa. Laporan presensi berhasil dibuat")
                break
            else:
                print("Pilihan salah, harap masukkan angka antara 1-4")
                mainMenu()
        except ValueError:
            print("Pilihan salah, harap masukkan angka antara 1-4\n Try Again")
    exit

def checkCamera():
    check_camera.camer()
    key = input("Klik enter untuk kembali ke menu awal")
    mainMenu()

def CaptureFaces():
    Capture_Image.takeImages()
    key = input("Klik enter untuk kembali ke menu awal")
    mainMenu()

def Trainimages():
    Train_Image.TrainImages()
    key = input("Klik enter untuk kembali ke menu awal")
    mainMenu()

def RecognizeFaces():
    Recognize.recognize_attendence()
    key = input("Klik enter untuk kembali ke menu awal")
    mainMenu()

mainMenu()
```

Lampiran 3 Program cek kamera

```
#! /usr/bin/python3
def camer():
    import cv2

    face_cascade = cv2.CascadeClassifier('haarcascade_frontalface_default.xml')

    cap = cv2.VideoCapture(0)

    while True:
        _, img = cap.read()
        gray = cv2.cvtColor(img, cv2.COLOR_BGR2GRAY)
        faces = face_cascade.detectMultiScale(gray, 1.3, 5, minSize=(30, 30),flags
= cv2.CASCADE_SCALE_IMAGE)

        for (x, y, w, h) in faces:
            cv2.rectangle(img, (x, y), (x + w, y + h), (10,159,255), 2)

        cv2.imshow('Cek Kamera', img)

        if cv2.waitKey(1) & 0xFF == ord('q'):
            break

    cap.release()
    cv2.destroyAllWindows()
```

Lampiran 4 Program daftar pegawai baru

```
#! /usr/bin/python3
import csv
import cv2
import os
import os.path

def is_number(s):
    try:
        float(s)
        return True
    except ValueError:
        pass

    try:
        import unicodedata
        unicodedata.numeric(s)
        return True
    except (TypeError, ValueError):
        pass

    return False

def takeImages():
    Id = input("Masukkan nomor pegawai anda: ")
    name = input("Masukkan nama anda: ")
    if(is_number(Id) and name.isalpha()):
        cam = cv2.VideoCapture(0)
        harcascadePath = "haarcascade_frontalface_default.xml"
        detector = cv2.CascadeClassifier(harcascadePath)
        sampleNum = 0
        while(True):
            ret, img = cam.read()
            gray = cv2.cvtColor(img, cv2.COLOR_BGR2GRAY)
            faces = detector.detectMultiScale(gray, 1.3, 5, minSize=(30,30),flags =
cv2.CASCADE_SCALE_IMAGE)
            for(x,y,w,h) in faces:
                cv2.rectangle(img, (x, y), (x+w, y+h), (10, 159, 255), 2)
                sampleNum = sampleNum+1
                cv2.imwrite("TrainingImage" + os.sep +name + "."+Id + '.' +
                            str(sampleNum) + ".jpg", gray[y:y+h, x:x+w])
                cv2.imshow('frame', img)
            if cv2.waitKey(100) & 0xFF == ord('q'):
                break
            elif sampleNum > 50:
                break
        cam.release()
        cv2.destroyAllWindows()
        res = "Data tersimpan untuk nomor pegawai : " + Id + " Nama : " + name
        header=["Id", "Name"]
        row = [Id, name]
        if(os.path.isfile("DataPegawai"+os.sep+"DataPegawai.csv")):
            with open("DataPegawai"+os.sep+"DataPegawai.csv", 'a+') as csvFile:
                writer = csv.writer(csvFile)
                writer.writerow(j for j in row)
            csvFile.close()
        else:
            with open("DataPegawai"+os.sep+"DataPegawai.csv", 'a+') as csvFile:
                writer = csv.writer(csvFile)
                writer.writerow(i for i in header)
                writer.writerow(j for j in row)
            csvFile.close()
    else:
        if(is_number(Id)):
            print("Nama hanya boleh huruf dan tanpa spasi!")
        if(name.isalpha()):
            print("Nomor pegawai harus angka!")
```

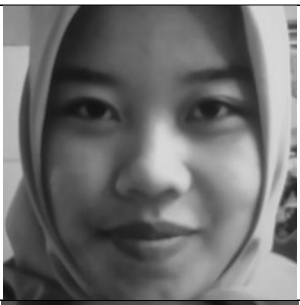
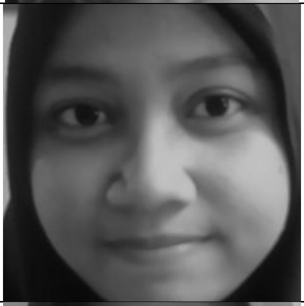
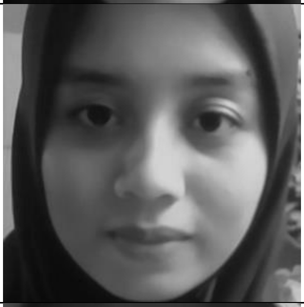
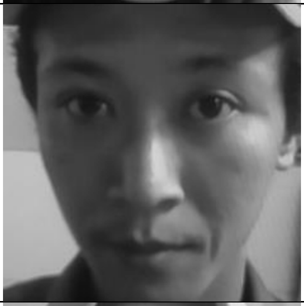
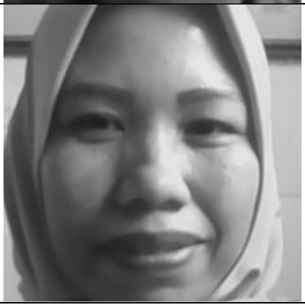
Lampiran 5 Program *training images*

```
#! /usr/bin/python3
import os
import time
import cv2
import numpy as np
from PIL import Image
from threading import Thread

def getImagesAndLabels(path):
    imagePaths = [os.path.join(path, f) for f in os.listdir(path)]
    faces = []
    Ids = []
    for imagePath in imagePaths:
        pilImage = Image.open(imagePath).convert('L')
        imageNp = np.array(pilImage, 'uint8')
        Id = int(os.path.split(imagePath)[-1].split(".")[1])
        faces.append(imageNp)
        Ids.append(Id)
    return faces, Ids

def TrainImages():
    recognizer = cv2.face_LBPHFaceRecognizer.create()
    harcascadePath = "haarcascade_frontalface_default.xml"
    detector = cv2.CascadeClassifier(harcascadePath)
    faces, Id = getImagesAndLabels("TrainingImage")
    Thread(target = recognizer.train(faces, np.array(Id))).start()
    Thread(target = counter_img("TrainingImage")).start()
    recognizer.save("TrainingImageLabel"+os.sep+"Trainner.yml")
    print("Semua data wajah berhasil di-training!")

def counter_img(path):
    imgcounter = 1
    imagePaths = [os.path.join(path, f) for f in os.listdir(path)]
    for imagePath in imagePaths:
        print(str(imgcounter) + " Data Wajah sedang di-training", end="\r")
        time.sleep(0.008)
        imgcounter += 1
```

Lampiran 6 Program presensi secara *real-time*

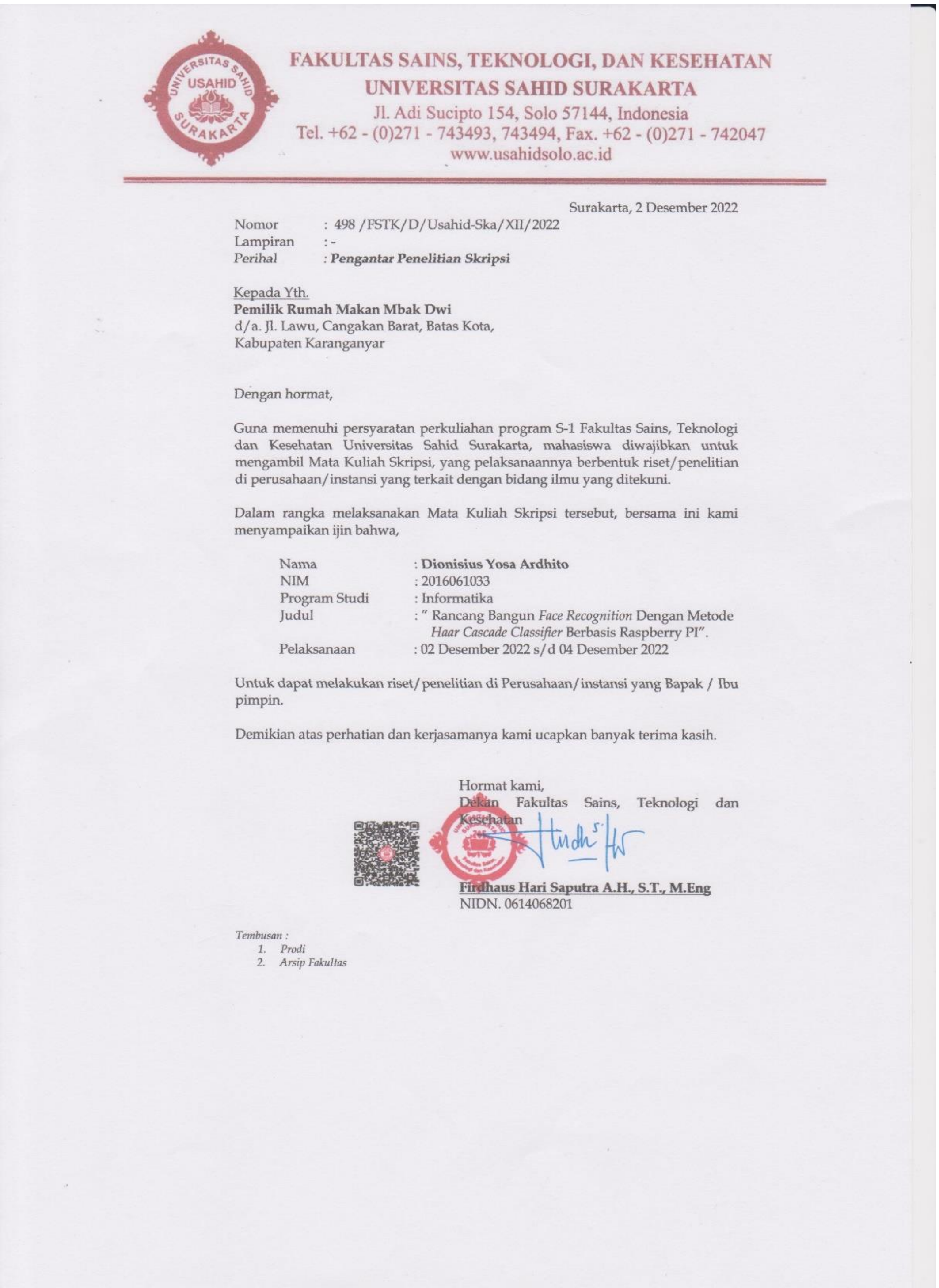
```
#! /usr/bin/python3
import datetime
import os
import time
import cv2
import pandas as pd

def recognize_attendence():
    recognizer = cv2.face.LBPHFaceRecognizer_create()  #
cv2.createLBPHFaceRecognizer()
    recognizer.read("./TrainingImageLabel/Trainner.yml")
    harcascadePath = "haarcascade_frontalface_default.xml"
    faceCascade = cv2.CascadeClassifier(harcascadePath)
    df = pd.read_csv("DataPegawai"+os.sep+"DataPegawai.csv")
    font = cv2.FONT_HERSHEY_SIMPLEX
    col_names = ['Id', 'Name', 'Date', 'Time']
    attendance = pd.DataFrame(columns=col_names)

    cam = cv2.VideoCapture(0)
    cam.set(3, 640)  # set video width
    cam.set(4, 480)  # set video height
    minW = 0.1 * cam.get(3)
    minH = 0.1 * cam.get(4)

    while True:
        _,im = cam.read()
        gray = cv2.cvtColor(im, cv2.COLOR_BGR2GRAY)
        faces = faceCascade.detectMultiScale(gray, 1.2, 5,minSize = (int(minW),
int(minH)),flags = cv2.CASCADE_SCALE_IMAGE)
        for(x, y, w, h) in faces:
            cv2.rectangle(im, (x, y), (x+w, y+h), (10, 159, 255), 2)
            Id, conf = recognizer.predict(gray[y:y+h, x:x+w])

            if conf < 100:
                aa = df.loc[df['Id'] == Id]['Name'].values
                confstr = "  {0}%".format(round(100 - conf))
                tt = str(Id)+"-"+aa
            else:
                Id = '  Tidak Diketahui  '
                tt = str(Id)
                confstr = "  {0}%".format(round(100 - conf))
            if (100-conf) > 60:
                ts = time.time()
                date = datetime.datetime.fromtimestamp(ts).strftime('%Y-%m-%d')
                timeStamp = 
datetime.datetime.fromtimestamp(ts).strftime('%H:%M:%S')
                aa = str(aa)[2:-2]
                attendance.loc[len(attendance)] = [Id, aa, date, timeStamp]

            tt = str(tt)[2:-2]
            if(100-conf) > 60:
                tt = tt + " [Absensi Sukses]"
                cv2.putText(im, str(tt), (x+5,y-5), font, 1, (255, 255, 255), 2)
            else:
                cv2.putText(im, str(tt), (x + 5, y - 5), font, 1, (255, 255, 255), 2)

            if (100-conf) > 60:
                cv2.putText(im, str(confstr), (x + 5, y + h - 5), font,1, (0, 255, 0),1 )
            elif (100-conf) > 50:
                cv2.putText(im, str(confstr), (x + 5, y + h - 5), font, 1, (0, 255, 255), 
1)
            else:
                cv2.putText(im, str(confstr), (x + 5, y + h - 5), font, 1, (0, 0, 255), 1)

        attendance = attendance.drop_duplicates(subset=['Id'], keep='first')
        cv2.imshow('Absensi Secara Real-Time', im)
        if (cv2.waitKey(1) == ord('q')):
            break
    ts = time.time()
    date = datetime.datetime.fromtimestamp(ts).strftime('%Y-%m-%d')
    timeStamp = datetime.datetime.fromtimestamp(ts).strftime('%H:%M:%S')
    Hour, Minute, Second = timeStamp.split(":")
    fileName = "DataAbsensi"+os.sep+"Absensi_"+date+"_"+Hour+"-
"+Minute+"-"+Second+".csv"
    attendance.to_csv(fileName, index=False)
    print("Absensi Sukses!")
    cam.release()
    cv2.destroyAllWindows()
```

Lampiran 7 Nama dan foto pegawai

Nama	Foto
Lisa	
Lola	
Siwi	
Adi	
Mur	

Arga	

Lampiran 8 Surat pengantar penelitian skripsi



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Surakarta, 2 Desember 2022

Nomor : 498 /FSTK/D/Usahid-Ska/XII/2022
Lampiran : -
Perihal : ***Pengantar Penelitian Skripsi***

Kepada Yth.
Pemilik Rumah Makan Mbak Dwi
d/a. Jl. Lawu, Cangakan Barat, Batas Kota,
Kabupaten Karanganyar

Dengan hormat,

Guna memenuhi persyaratan perkuliahan program S-1 Fakultas Sains, Teknologi dan Kesehatan Universitas Sahid Surakarta, mahasiswa diwajibkan untuk mengambil Mata Kuliah Skripsi, yang pelaksanaaannya berbentuk riset/penelitian di perusahaan/instansi yang terkait dengan bidang ilmu yang ditekuni.

Dalam rangka melaksanakan Mata Kuliah Skripsi tersebut, bersama ini kami menyampaikan ijin bahwa,

Nama	: **Dionisius Yosa Ardhito**
NIM	: 2016061033
Program Studi	: Informatika
Judul	: " Rancang Bangun *Face Recognition* Dengan Metode *Haar Cascade Classifier* Berbasis Raspberry PI".
Pelaksanaan	: 02 Desember 2022 s/d 04 Desember 2022

Untuk dapat melakukan riset/penelitian di Perusahaan/instansi yang Bapak / Ibu pimpin.

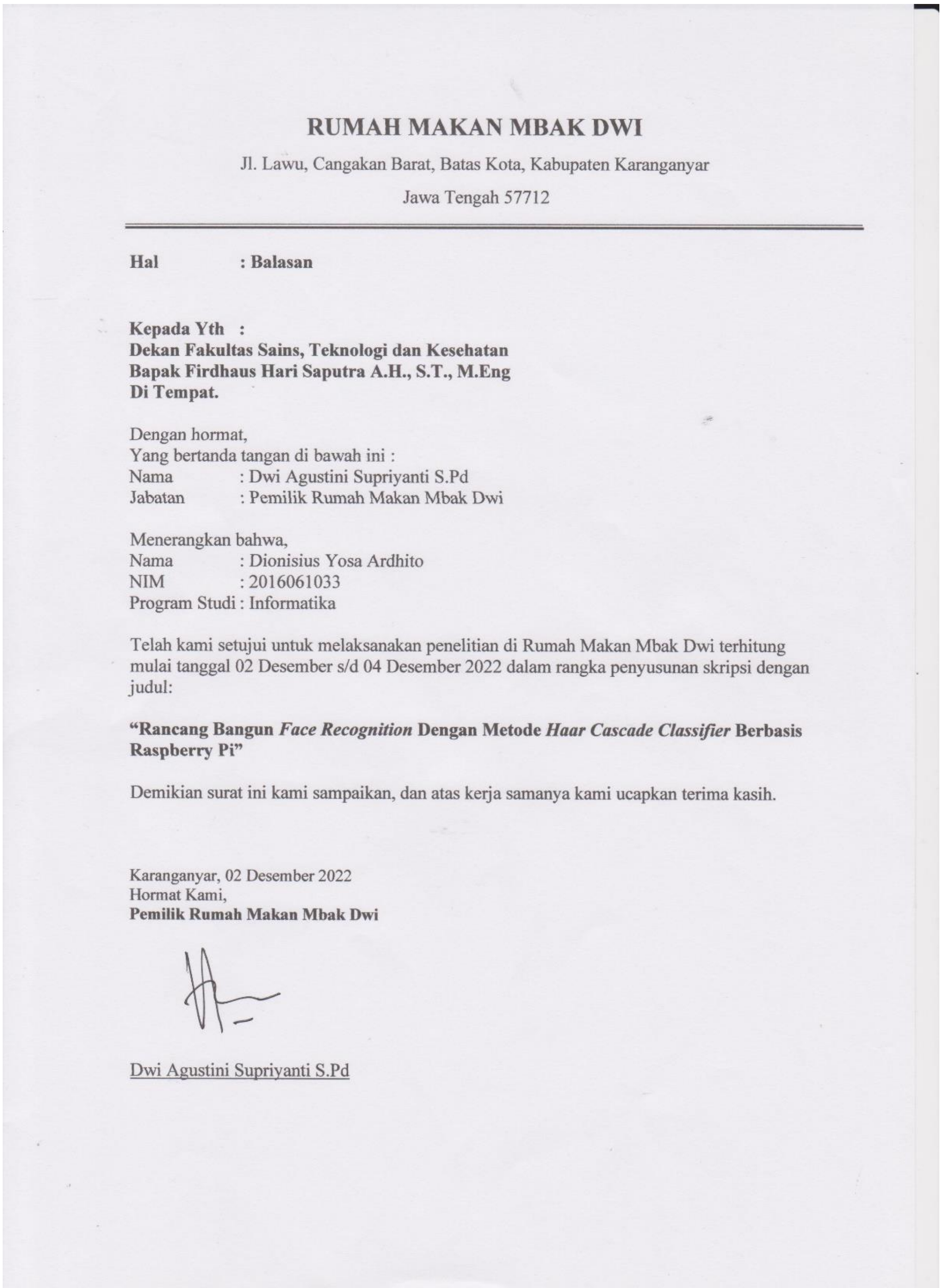
Demikian atas perhatian dan kerjasamanya kami ucapkan banyak terima kasih.

Hormat kami,
Dekan Fakultas Sains, Teknologi dan Kesehatan

Firdhaus Hari Saputra A.H., S.T., M.Eng
NIDN. 0614068201

Tembusan :
1. *Prodi*
2. *Arsip Fakultas*

Lampiran 9 Surat melakukan riset dan penelitian



RUMAH MAKAN MBAK DWI

Jl. Lawu, Cangakan Barat, Batas Kota, Kabupaten Karanganyar
Jawa Tengah 57712

Hal : Balasan

Kepada Yth :
Dekan Fakultas Sains, Teknologi dan Kesehatan
Bapak Firdhaus Hari Saputra A.H., S.T., M.Eng
Di Tempat.

Dengan hormat,
Yang bertanda tangan di bawah ini :
Nama : Dwi Agustini Supriyanti S.Pd
Jabatan : Pemilik Rumah Makan Mbak Dwi

Menerangkan bahwa,
Nama : Dionisius Yosa Ardhito
NIM : 2016061033
Program Studi : Informatika

Telah kami setujui untuk melaksanakan penelitian di Rumah Makan Mbak Dwi terhitung mulai tanggal 02 Desember s/d 04 Desember 2022 dalam rangka penyusunan skripsi dengan judul:

"Rancang Bangun *Face Recognition* Dengan Metode *Haar Cascade Classifier* Berbasis Raspberry Pi"

Demikian surat ini kami sampaikan, dan atas kerja samanya kami ucapkan terima kasih.

Karanganyar, 02 Desember 2022
Hormat Kami,
Pemilik Rumah Makan Mbak Dwi

Dwi Agustini Supriyanti S.Pd