

LAMPIRAN 1

BERITA ACARA BIMBINGAN SKRIPSI



PANITIA PELAKSANA PROGRAM
FAKULTAS SOSIAL DAN HUMANIORA
UNIVERSITAS NURUL JADID
PROBOLINGGO JAWA TIMUR

PP. Nurul Jadid
Karanganyar Ponor
Probolinggo 67291
T 08867077077
sashum@unuja.ac.id

BERITA ACARA BIMBINGAN SKRIPSI

1. Nama Mahasiswa : Mutmainnah
2. NIM : 2042200017
3. Prodi : Pendidikan Matematika
4. Judul Skripsi : Implementasi Modifikasi Interpolasi Spline Kubik dalam Menggambar Peta Indonesia

5. Konsultasi		KETERANGAN KONSULTASI/ARAHAN	PARAF
TANGGAL	MATERI BIMBINGAN		
28/04-24	Validasi Program	Pakai input yang lebih sedikit	N. H.
02/05-24	Validasi Pakai kode narasi	bandingkan Pakai coding dan Pakai cara manual	N. H.
11/05-24	Hasil gambar Pakai	Perbedaan gambar sebelum dan sesudah dimodifikasi	N. H.
16/05-24	input data	Pakai data yang diinput dari file	N. H.
21/05-24	evaluasi metode interpolasi	Pakai MSE dan MAPE	N. H.
27/05-24	Hasil Evaluasi metode	apa perbedaan hasil mse dan hasil MAPE	N. H.
01/06-24	Bab 4	cara menyambung kalimat hasil modifikasi	N. H.
06/06-24	Bab 4	cara Penempatan gambar/data	N. H.
10/06-24	Penulisan referensi	cara membuat rujukan menggunakan latex	N. H.
24/06-24	Penulisan matematika	cara Penulisan matematika di latex	N. H.
30/06-24	Hasil Penulisan bab 4	Hasil Penulisan bab 4	N. H.
07/07-24	Penulisan rujukan bab 2	mengubah referensi yg di Pakai pada Bab 2.	N. H.
04/07-24	Perbaikan Penulisan Bab 1-5	Pengecekan Penulisan kesalahan Penulisan	N. H.
06/07-24	melampirkan Program	cara membuat lampiran untuk program/ta.	N. H.

6. Bimbingan telah selesai pada tanggal 04 Juli 2024
- Dosen Pembimbing,

Nur Hamid, Ph.D

LAMPIRAN 2

PROGRAM PENELITIAN

Program Proses Interpolasi Spline Kubik

```
[ ]: #kode interpolasi kubik spline
import numpy as np
import matplotlib.pyplot as plt
from scipy.integrate import simpson

with open('data.txt', 'r') as file:
    data = file.readlines()
    data = [item.strip() for item in data]

def process_data_set(data_line):
    x_data, y_data = data_line.split(',')
    x = np.array([float(i) for i in x_data.split(',')])
    y = np.array([float(i) for i in y_data.split(',')])
    return x, y

all_plots = []
coefficients = []

for data_line in data:
    x, y = process_data_set(data_line)

    dx = np.diff(x)
    dy = np.diff(y)
    alpha = dy / dx

    A = np.zeros((len(x), len(x)))
    B = np.zeros(len(x))

    A[0, 0] = 1
    A[-1, -1] = 1

    for i in range(1, len(x) - 1):
        A[i, i - 1] = dx[i - 1]
        A[i, i] = 2 * (dx[i - 1] + dx[i])
```

[illegible]

Program Proses Modifikasi

```
[ ]: #kode modifikasi
titik_x = ([98, 102, 105])
titik_y = ([203, 205, 205])

data = list(zip(titik_x , titik_y))

print("titik_xy:", data)

def calculate_diff(points, divisor):
    results = []

    for i in range(len(points) - 1):
        p1 = points[i]
        p2 = points[i + 1]

        x_diff = abs((p2[0] + p1[0]) / divisor)
        y_diff = abs((p2[1] + p1[1]) / divisor)

        results.append((x_diff, y_diff))

    return results

points = data
points = titik_xy
divisor = 2

titik_tengah = calculate_diff(points, divisor)
print("Results:", titik_tengah)

Gabungan = []

for i in range(len(points)-1):
    Gabungan = Gabungan + [points[i]] + [titik_tengah[i]]
Gabungan = Gabungan + [points[len(points)-1]]
Gabungan

titik_xy = Gabungan
x_values = []
y_values = []

for titik in titik_xy :
    x, y = titik
    x_values.append(x)
    y_values.append(y)

print("titik_x:", x_values)
print("titik_y:", y_values)
```

Titik Data Peta Indonesia

```
[ ]: import numpy as np

# Jawa 1
x1 = np.array([135, 150, 151, 155, 165, 170, 180, 185, 190, 210, 223, 235, 240,
--245, 250, 255])
y1 = np.array([134, 135, 130, 127, 125, 124, 122, 124, 125, 119, 115, 115, 117,
--115, 113, 110])

# Jawa 2
x2 = np.array([135, 143, 144, 145, 147, 153, 155, 160, 163, 165, 175, 180, 190,
--200, 205, 208, 210, 220, 225, 227, 235, 240, 245, 247, 255])
y2 = np.array([134, 140, 143, 146, 150, 148, 148, 150, 150, 147, 147, 137, 138,
--137, 145, 145, 140, 138, 138, 130, 125, 125, 126, 115, 110])

# Sumatra 1
x3 = np.array([8, 20, 25, 30, 33, 36, 38, 40, 49, 50, 51, 55, 60, 63, 65, 68,
--73, 78, 83, 90, 95, 100, 110, 115, 117, 119, 120, 123, 125, 130, 134])
y3 = np.array([261, 250, 263, 260, 268, 236, 238, 230, 225, 220, 215, 210, 200,
--195, 190, 182, 180, 173, 168, 168, 159, 157, 150, 145, 149, 145, 145,
--150, 146, 150])

# Sumatra 2
x4 = np.array([8, 10, 20, 30, 35, 40, 41, 42, 43, 50, 55, 60, 64, 65, 70, 72,
--74, 77, 78, 89, 95, 103, 106])
y4 = np.array([261, 265, 263, 250, 263, 260, 255, 253, 248, 245, 243, 235, 234,
--235, 230, 233, 230, 228, 224, 215, 210, 210, 205])

# Sumatra 3
x5 = np.array([98, 102, 106])
y5 = np.array([203, 205, 205])

# Sumatra 4
x6 = np.array([98, 100, 103, 105, 112, 113, 115, 120, 125, 130, 132, 133, 134])
y6 = np.array([203, 200, 193, 195, 193, 186, 185, 183, 180, 175, 170, 160, 150])

# Kalimantan 1
```



```

x7 = np.array([186, 190, 193, 197, 200, 201, 203, 205, 215, 220, 232, 237, 231,
238, 245, 250, 255, 258, 265, 268, 273, 275])
y7 = np.array([207, 205, 200, 200, 195, 190, 185, 184, 184, 183, 179, 180, 178,
181, 180, 176, 173, 174, 173, 175, 185, 190])

#kalimantan 2
x8 = np.array([186, 187, 188, 189, 190, 193, 195, 205, 210, 220, 225, 230, 236,
250, 255 ])
y8 = np.array([207, 215, 220, 225, 230, 234, 238, 220, 220, 224, 226, 226, 225,
230, 235])

#kalimantan 3
x9 = np.array([252, 255, 264, 270, 280, 288])
y9 = np.array([240, 243, 250, 255, 256, 255])

#kalimantan 4
x10 = np.array([270, 274, 276, 283, 285, 286, 287, 290, 295, 300, 304])
y10 = np.array([185, 198, 203, 203, 205, 210, 215, 220, 221, 220, 224])

# kalimantan 5
x11 = np.array([288, 293, 295, 300, 301, 304 ])
y11 = np.array([ 233, 230, 226, 228, 225, 224])

#kalimantan 6
x12 = np.array([288, 289, 294 ])
y12 = np.array([240, 235, 235])

#kalimantan 7
x13 = np.array([284, 287, 289, 294])
y13 = np.array([245, 244, 240, 235])

#kalimantan 8
x14 = np.array([284, 285, 287, 290])
y14 = np.array([245, 246, 251, 255])

#kalimantan 9
x15 = np.array([252, 255])
y15 = np.array([240, 235])

#kalimantan 10
x16 = np.array([270, 275])
y16 = np.array([185, 190])

#kalimantan 1
x17 = np.array([329, 335, 340, 343])
y17 = np.array([160, 160, 160, 162])

```

```

#solusi 2
x18 = np.array([340, 343])
y18 = np.array([165, 163])

#solusi 3
x19 = np.array([340, 343])
y19 = np.array([165, 170])

#solusi 4
x20 = np.array([340, 343])
y20 = np.array([172, 170])

#solusi 5
x21 = np.array([340, 343])
y21 = np.array([172, 170])

#solusi 6
x22 = np.array([340, 343, 343])
y22 = np.array([180, 180, 170])

#solusi 7
x23 = np.array([340, 350])
y23 = np.array([180, 180])

#solusi 8
x24 = np.array([340, 350])
y24 = np.array([180, 180])

#solusi 9
x25 = np.array([348, 350])
y25 = np.array([189, 180])

#solusi 10
x26 = np.array([347, 348])
y26 = np.array([183, 180])

#solusi 11
x27 = np.array([347, 355, 358, 360, 362, 366, 373, 375])
y27 = np.array([183, 175, 159, 163, 170, 172, 172, 175])

#solusi 12
x28 = np.array([355, 360, 364, 365, 366, 370, 375])
y28 = np.array([200, 165, 160, 162, 165, 180, 175])

#solusi 13
x29 = np.array([355, 360, 365, 370, 375, 382])

```

```

y29 = np.array([200, 203, 205, 210, 211, 216])

#endcase1 14
x30 = np.array([339, 342, 345, 348, 353, 355, 360, 365, 370, 375, 380, 381])
y30 = np.array([210, 210, 205, 205, 207, 210, 210, 212, 210, 215, 215, 210])

#endcase1 15
x31 = np.array([335, 336, 338, 339])
y31 = np.array([223, 220, 215, 210])

#endcase1 16
x32 = np.array([336, 340, 345, 350, 360, 370, 380, 390, 395, 396, 400, 403])
y32 = np.array([223, 225, 226, 225, 225, 225, 225, 226, 228, 230, 234, 238])

#endcase1 17
x33 = np.array([330, 331, 332])
y33 = np.array([160, 170, 175])

#endcase1 18
x34 = np.array([323, 330, 332])
y34 = np.array([183, 180, 175])

#endcase1 19
x35 = np.array([323, 325])
y35 = np.array([183, 186])

#endcase1 20
x36 = np.array([320, 325])
y36 = np.array([190, 185])

#endcase1 21
x37 = np.array([320, 324, 325, 326, 329, 330, 332, 333])
y37 = np.array([190, 194, 197, 201, 206, 212, 216, 212])

#endcase1 22
x38 = np.array([332, 334, 335])
y38 = np.array([220, 215, 219])

#endcase1 23
x39 = np.array([332, 335, 336, 340, 343, 346, 347, 350, 355, 360, 365, 370, 380,
385, 392, 395, 400, 403])
y39 = np.array([220, 224, 225, 230, 229, 231, 234, 235, 235, 233, 232, 231, 231,
231, 235, 240, 246, 238])

#papuan
x40 = np.array([485, 486, 489, 490, 490, 504, 505, 510, 515, 520, 521, 522, 523,
529, 530, 533, 540, 545, 550, 555, 565, 570, 575, 585, 590, 600, 604])

```



```

#E2
x63 = np.array([345, 355, 355, 355, 364, 365, 375])
y63 = np.array([99, 100, 103, 98, 95, 93, 90])

#E1
x64 = np.array([366, 368, 370, 375, 380, 384, 387, 389, 391, 393, 394, 395, 400,
406])
y64 = np.array([109, 108, 109, 110, 109, 109, 110, 110, 107, 106, 107, 110, 111,
115])

#E2
x65 = np.array([366, 370, 375, 376, 381, 385, 387, 390, 394, 396, 400, 405, 406])
y65 = np.array([109, 106, 110, 115, 115, 113, 113, 115, 115, 113, 115, 120, 115])

# F 1
x66 = np.array([420, 425, 429, 434, 439, 444, 450, 455, 457, 464, 466])
y66 = np.array([85, 85, 85, 90, 95, 100, 105, 105, 108, 110, 115])

# F 2
x67 = np.array([420, 424, 422, 425, 430, 435, 440, 445, 450, 455, 460, 465, 466])
y67 = np.array([85, 90, 95, 100, 105, 105, 110, 114, 114, 113, 113, 116, 115])

# i 1
x68 = np.array([413, 419, 418, 423, 426, 438])
y68 = np.array([184, 183, 178, 180, 180, 183])

# i 2
x69 = np.array([413, 415, 420, 424, 426])
y69 = np.array([184, 177, 187, 189, 186])

# i 3
x70 = np.array([425, 428])
y70 = np.array([184, 186])

# i 4
x71 = np.array([425, 428])
y71 = np.array([184, 183])

# j 1
x72 = np.array([443, 447, 449, 453, 456, 460, 465, 468, 472, 480, 482])
y72 = np.array([183, 185, 185, 184, 186, 185, 185, 186, 184, 183, 183])

# j 2
x73 = np.array([443, 444, 448, 450, 455, 461, 465, 466, 467, 470, 475, 480, 482])

```

```

y73 = np.array ([183, 187, 188, 190, 190, 189, 193, 192, 190, 190, 189, 187,
..183])

#k 1
x74= np.array([520, 523, 524, 527, 528, 529, 530])
y74 = np.array([150, 150, 152, 153, 155, 160, 161])

#k 2
x75 = np.array([520, 521, 523])
y75 = np.array([150, 160, 162])

#k 3
x76 = np.array([521, 523])
y76 = np.array([164, 162])

#k 4
x77 = np.array([521, 522, 525, 527, 529])
y77 = np.array([164, 165, 165, 167, 165])

# l 1
x78 = np.array([553, 555, 558, 560, 563, 565, 566])
y78 = np.array([139, 139, 139, 139, 140, 140, 145])

#l 2
x79 = np.array([553, 555, 560, 564, 566])
y79 = np.array([140, 144, 145, 149, 145])

#m 1
x80 = np.array([121, 128, 129, 130])
y80 = np.array([193, 193, 195, 194])

# m 2
x81 = np.array([137, 140])
y81 = np.array([187, 184])

# m 3
x82 = np.array([137, 139])
y82 = np.array([187, 190])

# m 4
x83 = np.array([121, 123, 124, 126, 128, 130, 133, 135, 136])
y83 = np.array ([193, 196, 200, 198, 197, 199, 197, 190, 190])

# n 1
x84 = np.array([148, 150, 153, 155, 156])
y84 = np.array([172, 171, 173, 175, 175])

```

```

# a2
x85 = np.array([148, 149, 152, 156])
y85 = np.array([172, 178, 179, 175])

#analisa 1
x86 = np.array([428, 429, 430, 435])
y86 = np.array([235, 237, 243, 245])

#analisa 2
x87 = np.array([428, 431, 433])
y87 = np.array([235, 233, 230])

#analisa 3
x88 = np.array([429, 431])
y88 = np.array([228, 236])

#analisa 4
x89 = np.array([429, 434, 435])
y89 = np.array([228, 225, 223])

#analisa 5
x90 = np.array([434, 438])
y90 = np.array([218, 222])

#analisa 6
x91 = np.array([434, 438, 439])
y91 = np.array([218, 214, 216])

#analisa 7
x92 = np.array([436, 437, 438, 439])
y92 = np.array([225, 223, 219, 215])

#analisa 8
x93 = np.array([436, 443, 445, 448])
y93 = np.array([225, 225, 224, 226])

#analisa 9
x94 = np.array([440, 443, 445, 447, 448])
y94 = np.array([234, 236, 228, 226, 224])

#analisa 10
x95 = np.array([440, 445])
y95 = np.array([234, 238])

#analisa 11
x96 = np.array([434, 436, 437, 438, 439, 444, 445])

```

```

y96 = np.array([231, 232, 233, 234, 235, 236, 236])

#Analisa 12
x97 = np.array([434, 437])
y97 = np.array([231, 238])

#Analisa 13
x98 = np.array([435, 436, 437])
y98 = np.array([245, 246, 238])

# Menyimpan data ke file dengan format yang diinginkan
with open('data1.txt', 'w') as file:
    file.write(f'{','.join(map(str, x1))};{','.join(map(str, y1))}\n")
    file.write(f'{','.join(map(str, x2))};{','.join(map(str, y2))}\n")
    file.write(f'{','.join(map(str, x3))};{','.join(map(str, y3))}\n")
    file.write(f'{','.join(map(str, x4))};{','.join(map(str, y4))}\n")
    file.write(f'{','.join(map(str, x5))};{','.join(map(str, y5))}\n")
    file.write(f'{','.join(map(str, x6))};{','.join(map(str, y6))}\n")
    file.write(f'{','.join(map(str, x7))};{','.join(map(str, y7))}\n")
    file.write(f'{','.join(map(str, x8))};{','.join(map(str, y8))}\n")
    file.write(f'{','.join(map(str, x9))};{','.join(map(str, y9))}\n")
    file.write(f'{','.join(map(str, x10))};{','.join(map(str, y10))}\n")
    file.write(f'{','.join(map(str, x11))};{','.join(map(str, y11))}\n")
    file.write(f'{','.join(map(str, x12))};{','.join(map(str, y12))}\n")
    file.write(f'{','.join(map(str, x13))};{','.join(map(str, y13))}\n")
    file.write(f'{','.join(map(str, x14))};{','.join(map(str, y14))}\n")
    file.write(f'{','.join(map(str, x15))};{','.join(map(str, y15))}\n")
    file.write(f'{','.join(map(str, x16))};{','.join(map(str, y16))}\n")
    file.write(f'{','.join(map(str, x17))};{','.join(map(str, y17))}\n")
    file.write(f'{','.join(map(str, x18))};{','.join(map(str, y18))}\n")
    file.write(f'{','.join(map(str, x19))};{','.join(map(str, y19))}\n")
    file.write(f'{','.join(map(str, x20))};{','.join(map(str, y20))}\n")
    file.write(f'{','.join(map(str, x21))};{','.join(map(str, y21))}\n")
    file.write(f'{','.join(map(str, x22))};{','.join(map(str, y22))}\n")
    file.write(f'{','.join(map(str, x23))};{','.join(map(str, y23))}\n")
    file.write(f'{','.join(map(str, x24))};{','.join(map(str, y24))}\n")
    file.write(f'{','.join(map(str, x25))};{','.join(map(str, y25))}\n")
    file.write(f'{','.join(map(str, x26))};{','.join(map(str, y26))}\n")
    file.write(f'{','.join(map(str, x27))};{','.join(map(str, y27))}\n")
    file.write(f'{','.join(map(str, x28))};{','.join(map(str, y28))}\n")
    file.write(f'{','.join(map(str, x29))};{','.join(map(str, y29))}\n")
    file.write(f'{','.join(map(str, x30))};{','.join(map(str, y30))}\n")
    file.write(f'{','.join(map(str, x31))};{','.join(map(str, y31))}\n")
    file.write(f'{','.join(map(str, x32))};{','.join(map(str, y32))}\n")
    file.write(f'{','.join(map(str, x33))};{','.join(map(str, y33))}\n")
    file.write(f'{','.join(map(str, x34))};{','.join(map(str, y34))}\n")

```

[illegible]


```

file.write(f'{','.join(map(str, x82));{','.join(map(str, y82))}\n")
file.write(f'{','.join(map(str, x83));{','.join(map(str, y83))}\n")
file.write(f'{','.join(map(str, x84));{','.join(map(str, y84))}\n")
file.write(f'{','.join(map(str, x85));{','.join(map(str, y85))}\n")
file.write(f'{','.join(map(str, x86));{','.join(map(str, y86))}\n")
file.write(f'{','.join(map(str, x87));{','.join(map(str, y87))}\n")
file.write(f'{','.join(map(str, x88));{','.join(map(str, y88))}\n")
file.write(f'{','.join(map(str, x89));{','.join(map(str, y89))}\n")
file.write(f'{','.join(map(str, x90));{','.join(map(str, y90))}\n")
file.write(f'{','.join(map(str, x91));{','.join(map(str, y91))}\n")
file.write(f'{','.join(map(str, x92));{','.join(map(str, y92))}\n")
file.write(f'{','.join(map(str, x93));{','.join(map(str, y93))}\n")
file.write(f'{','.join(map(str, x94));{','.join(map(str, y94))}\n")
file.write(f'{','.join(map(str, x95));{','.join(map(str, y95))}\n")
file.write(f'{','.join(map(str, x96));{','.join(map(str, y96))}\n")
file.write(f'{','.join(map(str, x97));{','.join(map(str, y97))}\n")
file.write(f'{','.join(map(str, x98));{','.join(map(str, y98))}\n")

```



LAMPIRAN 3

KETERANGAN CEK PLAGIASI

mutmainnah - Mut Mainnah.pdf

ORIGINALITY REPORT

22%	20%	8%	9%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	repository.unuja.ac.id Internet Source	3%
2	journal.unj.ac.id Internet Source	1%
3	digilib.unila.ac.id Internet Source	1%
4	Submitted to Bocconi University Student Paper	1%
5	Bram Vanderborght. "Dynamic Stabilisation of the Biped Lucy Powered by Actuators with Controllable Stiffness", Springer Science and Business Media LLC, 2010 Publication	1%
6	docplayer.info Internet Source	1%
7	silo.pub Internet Source	1%
8	id.123dok.com Internet Source	1%



YAYASAN NURUL JADID PAITON
FAKULTAS SOSIAL DAN HUMANIORA
UNIVERSITAS NURUL JADID
PROBOLINGGO JAWA TIMUR

PP. Nurul Jadid
Karanganyar Paiton
Probolinggo 67291
☎ 08883077077
soshum@unuja.ac.id

KETERANGAN HASIL CHECK PLAGIASI

Yang bertanda tangan di bawah ini, tim check plagiasi Fakultas Sosial dan Humaniora menerangkan dengan sebenarnya, bahwa telah dilakukan check plagiasi dengan persentase 22% (Exclude Quotes dan Exclude Bibliography) pada tugas akhir/skripsi mahasiswa berikut:

Nama : MUTMAINNAH

NIM : 2042200017

Judul Skripsi : Implentasi Modifikasi Interpolasi Spline Kubik Dalam Menggambar Peta Indonesia

Demikian keterangan ini dibuat dengan sebenarnya dan untuk dijadikan persyaratan kelayakan mengikuti sidang tugas akhir/skripsi.

Paiton, 04 Agustus 2024



RM FARUQ, S.H.I

RIWAYAT HIDUP



MUTMAINNAH berdomisili Pondok Pesantren Nurul Jadid dan Berasal dari Desa Babo, Kecamatan Sang Tombolang, Kabupaten Bolaang Mongondow Provinsi Sulawesi Utara. Penulis lahir di Tinigi tanggal 15 September 2002, anak pertama dari dua bersaudara, pasangan Bapak Abdul Hafid dan Ibu Hasnia Paropo. Pendidikan dasarnya ditempuh di SDN 2 Bolangat selesai tahun 2014. Pendidikan menengah pertamanya di Mts Al-luthfi Lolanan selesai tahun 2017. Pendidikan menengah atasnya ditempuh di MA Al-Ma'arif Lolanan dengan berdomisili di Pondok Pesantren Al-luthfi, selesai tahun 2020. Penulis menempuh sarjana pendidikan matematika di Fakultas Sosial dan Humaniora Universitas Nurul Jadid Paiton Probolinggo.

Seiring dengan berbagai aktivitas yang penulis tekuni selama perkuliahan, penulis juga dapat menyelesaikan tugas akhir atau skripsi dengan judul "Implementasi Modifikasi Interpolasi Spline Kubik dalam menggambar Peta Indonesia " sebagai salah satu syarat untuk menyelesaikan studi pendidikan jenjang program Strata Satu (S1) Pendidikan Matematika.