

LAMPIRAN 1

Perhitungan Lengkap GF(5)

Pencacah Bobot Lengkap pada GF(5)				
• Elemen GF(5) = {0, 1, 2, 3, 4}				
• Menentukan nilai karakter				
$\chi_p(y) = e^{\frac{2\pi i}{p} xy}$				
$\chi = w$				
$= e^{2\pi i/5}$				
$= w^5$				
$= 1$				
Karakter trivial:				
$\chi_0(0) = 1$ $\chi_0(1) = 1$ $\chi_0(2) = 1$ $\chi_0(3) = 1$ $\chi_0(4) = 1$				
$\chi_0(0) = 1$ $\chi_0(1) = 1$ $\chi_0(2) = 1$ $\chi_0(3) = 1$ $\chi_0(4) = 1$				
Nilai karakter:				
$\chi_1(0) = w^{1 \cdot 0}$	$\chi_1(1) = w^{1 \cdot 1}$	$\chi_1(2) = w^{1 \cdot 2}$	$\chi_1(3) = w^{1 \cdot 3}$	$\chi_1(4) = w^{1 \cdot 4}$
$= w^0$	$= w^1$	$= w^2$	$= w^3$	$= w^4$
$= 1$	$= w$			
$\chi_2(0) = w^{2 \cdot 0}$	$\chi_2(1) = w^{2 \cdot 1}$	$\chi_2(2) = w^{2 \cdot 2}$	$\chi_2(3) = w^{2 \cdot 3}$	$\chi_2(4) = w^{2 \cdot 4}$
$= w^0$	$= w^2$	$= w^4$	$= w^6$	$= w^8$
$= 1$		$= w$	$= w^3$	$= w^4$
$\chi_3(0) = w^{3 \cdot 0}$	$\chi_3(1) = w^{3 \cdot 1}$	$\chi_3(2) = w^{3 \cdot 2}$	$\chi_3(3) = w^{3 \cdot 3}$	$\chi_3(4) = w^{3 \cdot 4}$
$= w^0$	$= w^3$	$= w^6$	$= w^9$	$= w^{12}$
$= 1$		$= w$	$= w^4$	$= w^2$
$\chi_4(0) = w^{4 \cdot 0}$	$\chi_4(1) = w^{4 \cdot 1}$	$\chi_4(2) = w^{4 \cdot 2}$	$\chi_4(3) = w^{4 \cdot 3}$	$\chi_4(4) = w^{4 \cdot 4}$
$= w^0$	$= w^4$	$= w^8$	$= w^{12}$	$= w^{16}$
$= 1$		$= w^3$	$= w^2$	$= w$
• Nilai karakter				
$\chi_0(0) = 1$	$\chi_1(0) = 1$	$\chi_2(0) = 1$	$\chi_3(0) = 1$	$\chi_4(0) = 1$
$\chi_0(1) = 1$	$\chi_1(1) = w$	$\chi_2(1) = w^2$	$\chi_3(1) = w^3$	$\chi_4(1) = w^4$
$\chi_0(2) = 1$	$\chi_1(2) = w^2$	$\chi_2(2) = w^4$	$\chi_3(2) = w$	$\chi_4(2) = w^3$
$\chi_0(3) = 1$	$\chi_1(3) = w^3$	$\chi_2(3) = w$	$\chi_3(3) = w^4$	$\chi_4(3) = w^2$
$\chi_0(4) = 1$	$\chi_1(4) = w^4$	$\chi_2(4) = w^3$	$\chi_3(4) = w^2$	$\chi_4(4) = w$

Gambar 5.1 Perhitungan untuk GF(5)

Dari nilai karakter diperoleh transformasi Linier:

1	1	1	1	1
1	ω	ω^2	ω^3	ω^4
1	ω^2	ω^4	ω	ω^3
1	ω^3	ω	ω^4	ω^2
1	ω^4	ω^3	ω^2	ω

Selanjutnya transformasi dari matriks ke $(z_0, z_1, z_2, z_3, z_4)$

1	1	1	1	1	z_0
1	ω	ω^2	ω^3	ω^4	z_1
1	ω^2	ω^4	ω	ω^3	z_2
1	ω^3	ω	ω^4	ω^2	z_3
1	ω^4	ω^3	ω^2	ω	z_4

Baris 0 $(z_0, z_1, z_2, z_3, z_4) = (1, 1, 1, 1, 1)$

Baris 1 $(z_0, z_1, z_2, z_3, z_4) = (1, \omega, \omega^2, \omega^3, \omega^4)$

Baris 2 $(z_0, z_1, z_2, z_3, z_4) = (1, \omega^2, \omega^4, \omega, \omega^3)$

Baris 3 $(z_0, z_1, z_2, z_3, z_4) = (1, \omega^3, \omega, \omega^4, \omega^2)$

Baris 4 $(z_0, z_1, z_2, z_3, z_4) = (1, \omega^4, \omega^3, \omega^2, \omega)$

Menghasilkan 5-tuple $(z_0, z_1, z_2, z_3, z_4)$

$(1, 1, 1, 1, 1), (1, \omega, \omega^2, \omega^3, \omega^4), (1, \omega^2, \omega^4, \omega, \omega^3), (1, \omega^3, \omega, \omega^4, \omega^2), (1, \omega^4, \omega^3, \omega^2, \omega)$

$(1, \omega^4, \omega^3, \omega^2, \omega)$

Dari GF(5) diperoleh $\{w_0=0, w_1=1, w_2=2, w_3=3, w_4=4\}$

Persamaan Pencacab Bobot Lengkap

$$W_c(z_0, z_1, z_2, z_3, z_4) = \frac{1}{|C|} W_c \left[\sum_{i=0}^4 \chi_i(w_0, w_i) z_i, \sum_{i=0}^4 \chi_i(w_1, w_i) z_i, \sum_{i=0}^4 \chi_i(w_2, w_i) z_i, \sum_{i=0}^4 \chi_i(w_3, w_i) z_i, \sum_{i=0}^4 \chi_i(w_4, w_i) z_i \right]$$

$$\rightarrow \sum_{i=0}^4 \chi_i(w_0, w_i) z_i = \chi_1(w_0, w_0) z_0 + \chi_1(w_0, w_1) z_1 + \chi_1(w_0, w_2) z_2 + \chi_1(w_0, w_3) z_3 + \chi_1(w_0, w_4) z_4$$

$$= \chi_1(0, 0) z_0 + \chi_1(0, 1) z_1 + \chi_1(0, 2) z_2 + \chi_1(0, 3) z_3 + \chi_1(0, 4) z_4$$

$$= \chi_1(0) z_0 + \chi_1(0) z_1 + \chi_1(0) z_2 + \chi_1(0) z_3 + \chi_1(0) z_4$$

$$= z_0 + z_1 + z_2 + z_3 + z_4$$



$$\begin{aligned}
 \rightarrow \sum_{s=0}^4 \chi_1(w_1 \cdot w_s) z_s &= \chi_1(w_1 \cdot w_0) z_0 + \chi_1(w_1 \cdot w_1) z_1 + \chi_1(w_1 \cdot w_2) z_2 + \chi_1(w_1 \cdot w_3) z_3 \\
 &\quad + \chi_1(w_1 \cdot w_4) z_4 \\
 &= \chi_1(1 \cdot 0) z_0 + \chi_1(1 \cdot 1) z_1 + \chi_1(1 \cdot 2) z_2 + \chi_1(1 \cdot 3) z_3 + \chi_1(1 \cdot 4) z_4 \\
 &= \chi_1(0) z_0 + \chi_1(1) z_1 + \chi_1(2) z_2 + \chi_1(3) z_3 + \chi_1(4) z_4 \\
 &= z_0 + w z_1 + w^2 z_2 + w^3 z_3 + w^4 z_4 \\
 \rightarrow \sum_{s=0}^4 \chi_1(w_2 \cdot w_s) z_s &= \chi_1(w_2 \cdot w_0) z_0 + \chi_1(w_2 \cdot w_1) z_1 + \chi_1(w_2 \cdot w_2) z_2 + \chi_1(w_2 \cdot w_3) z_3 \\
 &\quad + \chi_1(w_2 \cdot w_4) z_4 \\
 &= \chi_1(2 \cdot 0) z_0 + \chi_1(2 \cdot 1) z_1 + \chi_1(2 \cdot 2) z_2 + \chi_1(2 \cdot 3) z_3 + \chi_1(2 \cdot 4) z_4 \\
 &= \chi_1(0) z_0 + \chi_1(3) z_1 + \chi_1(4) z_2 + \chi_1(1) z_3 + \chi_1(3) z_4 \\
 &= z_0 + w^3 z_1 + w^4 z_2 + w z_3 + w^3 z_4 \\
 \rightarrow \sum_{s=0}^4 \chi_1(w_3 \cdot w_s) z_s &= \chi_1(w_3 \cdot w_0) z_0 + \chi_1(w_3 \cdot w_1) z_1 + \chi_1(w_3 \cdot w_2) z_2 + \chi_1(w_3 \cdot w_3) z_3 \\
 &\quad + \chi_1(w_3 \cdot w_4) z_4 \\
 &= \chi_1(3 \cdot 0) z_0 + \chi_1(3 \cdot 1) z_1 + \chi_1(3 \cdot 2) z_2 + \chi_1(3 \cdot 3) z_3 + \chi_1(3 \cdot 4) z_4 \\
 &= \chi_1(0) z_0 + \chi_1(3) z_1 + \chi_1(1) z_2 + \chi_1(4) z_3 + \chi_1(2) z_4 \\
 &= z_0 + w^3 z_1 + w z_2 + w^4 z_3 + w^2 z_4 \\
 \rightarrow \sum_{s=0}^4 \chi_1(w_4 \cdot w_s) z_s &= \chi_1(w_4 \cdot w_0) z_0 + \chi_1(w_4 \cdot w_1) z_1 + \chi_1(w_4 \cdot w_2) z_2 + \chi_1(w_4 \cdot w_3) z_3 \\
 &\quad + \chi_1(w_4 \cdot w_4) z_4 \\
 &= \chi_1(4 \cdot 0) z_0 + \chi_1(4 \cdot 1) z_1 + \chi_1(4 \cdot 2) z_2 + \chi_1(4 \cdot 3) z_3 + \chi_1(4 \cdot 4) z_4 \\
 &= \chi_1(0) z_0 + \chi_1(4) z_1 + \chi_1(3) z_2 + \chi_1(2) z_3 + \chi_1(1) z_4 \\
 &= z_0 + w^4 z_1 + w^3 z_2 + w^2 z_3 + w z_4
 \end{aligned}$$

• Persamaan Pencacah Bobot Lengkap untuk GF(5)

$$Wc^t(z_0, z_1, z_2, z_3, z_4) = \frac{1}{|C|} \cdot Wc \begin{pmatrix} z_0 + z_1 + z_2 + z_3 + z_4, z_0 + w z_1 + w^2 z_2 + w^3 z_3 + w^4 z_4, \\ z_0 + w^2 z_1 + w^4 z_2 + w z_3 + w^3 z_4, z_0 + w^3 z_1 + w z_2 + \\ w^4 z_3 + w^2 z_4, z_0 + w^4 z_1 + w^3 z_2 + w^2 z_3 + w z_4 \end{pmatrix}$$

Perhitungan Lengkap GF(7)

Pencacah Bobot Lengkap pada GF(7)

- Elemen GF(7) = {0, 1, 2, 3, 4, 5, 6}

- Menentukan nilai karakter

$$\chi_r(y) = \epsilon^{0y + 1y + \dots + (m-1)y + (m-1)}$$

$$\epsilon = \omega = e^{2\pi i / 7}$$

$$= e^{2\pi i / 7}$$

$$= \omega^1$$

$$= 1$$

Karakter trivial

$$\chi_0(0) = 1 \quad \chi_0(4) = 1$$

$$\chi_0(1) = 1 \quad \chi_0(5) = 1$$

$$\chi_0(2) = 1 \quad \chi_0(6) = 1$$

$$\chi_0(3) = 1$$

Menentukan Nilai Karakter

$$\chi_1(0) = \omega^{1 \cdot 0}$$

$$= \omega^0$$

$$= 1$$

$$\chi_1(1) = \omega^{1 \cdot 1}$$

$$= \omega$$

$$\chi_1(2) = \omega^{1 \cdot 2}$$

$$= \omega^2$$

$$\chi_1(3) = \omega^{1 \cdot 3}$$

$$= \omega^3$$

$$\chi_1(4) = \omega^{1 \cdot 4}$$

$$= \omega^4$$

$$\chi_1(5) = \omega^{1 \cdot 5}$$

$$= \omega^5$$

$$\chi_1(6) = \omega^{1 \cdot 6}$$

$$= \omega^6$$

$$\chi_2(0) = \omega^{2 \cdot 0}$$

$$= \omega^0 = 1$$

$$\chi_2(1) = \omega^{2 \cdot 1}$$

$$= \omega^2$$

$$\chi_2(2) = \omega^{2 \cdot 2}$$

$$= \omega^4$$

$$\chi_2(3) = \omega^{2 \cdot 3}$$

$$= \omega^6$$

$$\chi_2(4) = \omega^{2 \cdot 4}$$

$$= \omega^8 = \omega$$

$$\chi_2(5) = \omega^{2 \cdot 5}$$

$$= \omega^{10} = \omega^3$$

$$\chi_2(6) = \omega^{2 \cdot 6}$$

$$= \omega^{12} = \omega^5$$

$$\chi_3(0) = \omega^{3 \cdot 0}$$

$$= \omega^0 = 1$$

$$\chi_3(1) = \omega^{3 \cdot 1}$$

$$= \omega^3$$

$$\chi_3(2) = \omega^{3 \cdot 2}$$

$$= \omega^6$$

$$\chi_3(3) = \omega^{3 \cdot 3}$$

$$= \omega^9 = \omega^2$$

$$\chi_3(4) = \omega^{3 \cdot 4}$$

$$= \omega^5$$

$$\chi_3(5) = \omega^{3 \cdot 5}$$

$$= \omega^{15} = \omega$$

$$\chi_3(6) = \omega^{3 \cdot 6}$$

$$= \omega^{18} = \omega^4$$

$$\chi_4(0) = \omega^{4 \cdot 0}$$

$$= \omega^0 = 1$$

$$\chi_4(1) = \omega^{4 \cdot 1}$$

$$= \omega^4$$

$$\chi_4(2) = \omega^{4 \cdot 2}$$

$$= \omega^8 = \omega$$

$$\chi_4(3) = \omega^{4 \cdot 3}$$

$$= \omega^{12} = \omega^5$$

$$\chi_4(4) = \omega^{4 \cdot 4}$$

$$= \omega^{16} = \omega^2$$

$$\chi_4(5) = \omega^{4 \cdot 5}$$

$$= \omega^{20} = \omega^6$$

$$\chi_4(6) = \omega^{4 \cdot 6}$$

$$= \omega^{24} = \omega^3$$



Gambar 5.2 Perhitungan untuk GF(7)

$$\begin{array}{lllll} \chi_5(0) = \omega^{5 \cdot 0} & \chi_5(1) = \omega^{5 \cdot 1} & \chi_5(2) = \omega^{5 \cdot 2} & \chi_5(3) = \omega^{5 \cdot 3} & \chi_5(4) = \omega^{5 \cdot 4} \\ = \omega^0 = 1 & = \omega^5 & = \omega^{10} = \omega^2 & = \omega^{15} = \omega & = \omega^{20} = \omega^4 \\ \chi_5(5) = \omega^{5 \cdot 5} & \chi_5(6) = \omega^{5 \cdot 6} & & & \\ = \omega^{25} = \omega^4 & = \omega^{30} = \omega^2 & & & \end{array}$$

$$\begin{array}{lllll} \chi_6(0) = \omega^{6 \cdot 0} & \chi_6(1) = \omega^{6 \cdot 1} & \chi_6(2) = \omega^{6 \cdot 2} & \chi_6(3) = \omega^{6 \cdot 3} & \chi_6(4) = \omega^{6 \cdot 4} \\ = \omega^0 = 1 & = \omega^6 & = \omega^{12} = \omega^5 & = \omega^{18} = \omega^4 & = \omega^{24} = \omega^3 \\ \chi_6(5) = \omega^{6 \cdot 5} & \chi_6(6) = \omega^{6 \cdot 6} & & & \\ = \omega^{30} = \omega^2 & = \omega^{36} = \omega & & & \end{array}$$

• Hasil nilai karakter

$\chi_0(0)=1$	$\chi_1(0)=1$	$\chi_2(0)=1$	$\chi_3(0)=1$	$\chi_4(0)=1$	$\chi_5(0)=1$	$\chi_6(0)=1$
$\chi_0(1)=1$	$\chi_1(1)=\omega$	$\chi_2(1)=\omega^2$	$\chi_3(1)=\omega^3$	$\chi_4(1)=\omega^4$	$\chi_5(1)=\omega^5$	$\chi_6(1)=\omega^6$
$\chi_0(2)=1$	$\chi_1(2)=\omega^2$	$\chi_2(2)=\omega^4$	$\chi_3(2)=\omega^1$	$\chi_4(2)=\omega$	$\chi_5(2)=\omega^2$	$\chi_6(2)=\omega^5$
$\chi_0(3)=1$	$\chi_1(3)=\omega^3$	$\chi_2(3)=\omega^6$	$\chi_3(3)=\omega^2$	$\chi_4(3)=\omega^5$	$\chi_5(3)=\omega$	$\chi_6(3)=\omega^4$
$\chi_0(4)=1$	$\chi_1(4)=\omega^4$	$\chi_2(4)=\omega$	$\chi_3(4)=\omega^5$	$\chi_4(4)=\omega^3$	$\chi_5(4)=\omega^4$	$\chi_6(4)=\omega^3$
$\chi_0(5)=1$	$\chi_1(5)=\omega^5$	$\chi_2(5)=\omega^3$	$\chi_3(5)=\omega$	$\chi_4(5)=\omega^6$	$\chi_5(5)=\omega^4$	$\chi_6(5)=\omega^1$
$\chi_0(6)=1$	$\chi_1(6)=\omega^6$	$\chi_2(6)=\omega^5$	$\chi_3(6)=\omega^4$	$\chi_4(6)=\omega^2$	$\chi_5(6)=\omega^3$	$\chi_6(6)=\omega$

Dari nilai karakter diperoleh transformasi linier

1	1	1	1	1	1	1
1	ω	ω^2	ω^3	ω^4	ω^5	ω^6
1	ω^2	ω^4	ω^6	ω	ω^3	ω^5
1	ω^3	ω^6	ω^5	ω	ω^4	ω^2
1	ω^4	ω	ω^5	ω^2	ω^6	ω^3
1	ω^5	ω^3	ω	ω^6	ω^4	ω^1
1	ω^6	ω^5	ω^4	ω^3	ω^2	ω^1

• Transformasi dari matriks ke $(z_0, z_1, z_2, z_3, z_4, z_5, z_6)$

1	1	1	1	1	1	1	z_0
1	ω	ω^2	ω^3	ω^4	ω^5	ω^6	z_1
1	ω^2	ω^4	ω^6	ω	ω^3	ω^5	z_2
1	ω^3	ω^6	ω^5	ω	ω^4	ω^2	z_3
1	ω^4	ω	ω^5	ω^2	ω^6	ω^3	z_4
1	ω^5	ω^3	ω	ω^6	ω^4	ω^1	z_5
1	ω^6	ω^5	ω^4	ω^3	ω^2	ω^1	z_6



Baris 0 ($z_0, z_1, z_2, z_3, z_4, z_5, z_6$) = (1, 1, 1, 1, 1, 1, 1)

Baris 1 ($z_0, z_1, z_2, z_3, z_4, z_5, z_6$) = (1, $w, w^2, w^3, w^4, w^5, w^6$)

Baris 2 ($z_0, z_1, z_2, z_3, z_4, z_5, z_6$) = (1, $w^2, w^4, w^6, w, w^3, w^5$)

Baris 3 ($z_0, z_1, z_2, z_3, z_4, z_5, z_6$) = (1, $w^3, w^6, w^5, w^2, w, w^4$)

Baris 4 ($z_0, z_1, z_2, z_3, z_4, z_5, z_6$) = (1, $w^4, w, w^5, w^2, w^6, w^3$)

Baris 5 ($z_0, z_1, z_2, z_3, z_4, z_5, z_6$) = (1, $w^5, w^3, w, w^6, w^4, w^2$)

Baris 6 ($z_0, z_1, z_2, z_3, z_4, z_5, z_6$) = (1, $w^6, w^5, w^4, w^3, w^2, w$)

Menghasilkan 7-tuple ($z_0, z_1, z_2, z_3, z_4, z_5, z_6$)

(1, 1, 1, 1, 1, 1, 1), (1, $w, w^2, w^3, w^4, w^5, w^6$), (1, $w^2, w^4, w^6, w, w^3, w^5$), (1, $w^3, w^6, w^5, w^2, w, w^4$), (1, $w^4, w, w^5, w^2, w^6, w^3$), (1, $w^5, w^3, w, w^6, w^4, w^2$), (1, $w^6, w^5, w^4, w^3, w^2, w$)

• Persamaan Pencacah Bobot Lengkap

$$W^t(z_0, z_1, z_2, z_3, z_4, z_5, z_6) = \frac{1}{|C|} \left(\sum_{s=0}^6 \chi_s(w_0 \cdot w_s) z_s + \sum_{s=0}^6 \chi_s(w_1 \cdot w_s) z_s + \sum_{s=0}^6 \chi_s(w_2 \cdot w_s) z_s + \sum_{s=0}^6 \chi_s(w_3 \cdot w_s) z_s + \sum_{s=0}^6 \chi_s(w_4 \cdot w_s) z_s + \sum_{s=0}^6 \chi_s(w_5 \cdot w_s) z_s + \sum_{s=0}^6 \chi_s(w_6 \cdot w_s) z_s \right)$$

$$\begin{aligned} \sum_{s=0}^6 \chi_s(w_0 \cdot w_s) z_s &= \chi_0(w_0 \cdot w_0) z_0 + \chi_1(w_0 \cdot w_1) z_1 + \chi_2(w_0 \cdot w_2) z_2 + \chi_3(w_0 \cdot w_3) z_3 + \\ &\quad \chi_4(w_0 \cdot w_4) z_4 + \chi_5(w_0 \cdot w_5) z_5 + \chi_6(w_0 \cdot w_6) z_6 \\ &= \chi_1(0 \cdot 0) z_0 + \chi_1(0 \cdot 1) z_1 + \chi_1(0 \cdot 2) z_2 + \chi_1(0 \cdot 3) z_3 + \chi_1(0 \cdot 4) z_4 \\ &\quad + \chi_1(0 \cdot 5) z_5 + \chi_1(0 \cdot 6) z_6 \\ &= \chi_1(0) z_0 + \chi_1(0) z_1 + \chi_1(0) z_2 + \chi_1(0) z_3 + \chi_1(0) z_4 + \chi_1(0) z_5 \\ &\quad + \chi_1(0) z_6 \\ &= z_0 + z_1 + z_2 + z_3 + z_4 + z_5 + z_6 \end{aligned}$$

$$\begin{aligned} \sum_{s=0}^6 \chi_s(w_1 \cdot w_s) z_s &= \chi_1(w_1 \cdot w_0) z_0 + \chi_1(w_1 \cdot w_1) z_1 + \chi_1(w_1 \cdot w_2) z_2 + \chi_1(w_1 \cdot w_3) z_3 + \\ &\quad \chi_1(w_1 \cdot w_4) z_4 + \chi_1(w_1 \cdot w_5) z_5 + \chi_1(w_1 \cdot w_6) z_6 \\ &= \chi_1(1 \cdot 0) z_0 + \chi_1(1 \cdot 1) z_1 + \chi_1(1 \cdot 2) z_2 + \chi_1(1 \cdot 3) z_3 + \chi_1(1 \cdot 4) z_4 \\ &\quad + \chi_1(1 \cdot 5) z_5 + \chi_1(1 \cdot 6) z_6 \\ &= \chi_1(0) z_0 + \chi_1(1) z_1 + \chi_1(2) z_2 + \chi_1(3) z_3 + \chi_1(4) z_4 + \chi_1(5) z_5 \\ &\quad + \chi_1(6) z_6 \\ &= z_0 + w z_1 + w^2 z_2 + w^3 z_3 + w^4 z_4 + w^5 z_5 + w^6 z_6 \end{aligned}$$

$$\begin{aligned} \sum_{s=0}^6 \chi_s(w_2 \cdot w_s) z_s &= \chi_1(w_2 \cdot w_0) z_0 + \chi_1(w_2 \cdot w_1) z_1 + \chi_1(w_2 \cdot w_2) z_2 + \chi_1(w_2 \cdot w_3) z_3 + \chi_1(w_2 \cdot w_4) z_4 \\ &\quad + \chi_1(w_2 \cdot w_5) z_5 + \chi_1(w_2 \cdot w_6) z_6 \\ &= \chi_1(2 \cdot 0) z_0 + \chi_1(2 \cdot 1) z_1 + \chi_1(2 \cdot 2) z_2 + \chi_1(2 \cdot 3) z_3 + \chi_1(2 \cdot 4) z_4 \\ &\quad + \chi_1(2 \cdot 5) z_5 + \chi_1(2 \cdot 6) z_6 \\ &= \chi_1(0) z_0 + \chi_1(2) z_1 + \chi_1(4) z_2 + \chi_1(6) z_3 + \chi_1(1) z_4 + \chi_1(3) z_5 + \chi_1(5) z_6 \\ &= z_0 + w^2 z_1 + w^4 z_2 + w^6 z_3 + w z_4 + w^3 z_5 + w^5 z_6 \end{aligned}$$



$$\begin{aligned}
 \rightarrow \sum_{s=0}^6 x_1(w_s \cdot w_s) z_s &= x_1(w_s \cdot w_0) z_0 + x_1(w_s \cdot w_1) z_1 + x_1(w_s \cdot w_2) z_2 + x_1(w_s \cdot w_3) z_3 + \\
 &\quad x_1(w_s \cdot w_4) z_4 + x_1(w_s \cdot w_5) z_5 + x_1(w_s \cdot w_6) z_6 \\
 &= x_1(3 \cdot 0) z_0 + x_1(3 \cdot 1) z_1 + x_1(3 \cdot 2) z_2 + x_1(3 \cdot 3) z_3 + x_1(3 \cdot 4) z_4 + \\
 &\quad x_1(3 \cdot 5) z_5 + x_1(3 \cdot 6) z_6 \\
 &= x_1(0) z_0 + x_1(3) z_1 + x_1(6) z_2 + x_1(2) z_3 + x_1(5) z_4 + x_1(1) z_5 + x_1(4) z_6 \\
 &= z_0 + w^3 z_1 + w^6 z_2 + w^2 z_3 + w^5 z_4 + w z_5 + w^4 z_6 \\
 \rightarrow \sum_{s=0}^6 x_1(w_4 \cdot w_s) z_s &= x_1(w_4 \cdot w_0) z_0 + x_1(w_4 \cdot w_1) z_1 + x_1(w_4 \cdot w_2) z_2 + x_1(w_4 \cdot w_3) z_3 + \\
 &\quad x_1(w_4 \cdot w_4) z_4 + x_1(w_4 \cdot w_5) z_5 + x_1(w_4 \cdot w_6) z_6 \\
 &= x_1(4 \cdot 0) z_0 + x_1(4 \cdot 1) z_1 + x_1(4 \cdot 2) z_2 + x_1(4 \cdot 3) z_3 + x_1(4 \cdot 4) z_4 + \\
 &\quad x_1(4 \cdot 5) z_5 + x_1(4 \cdot 6) z_6 \\
 &= x_1(0) z_0 + x_1(4) z_1 + x_1(1) z_2 + x_1(5) z_3 + x_1(2) z_4 + x_1(6) z_5 + \\
 &\quad x_1(3) z_6 \\
 &= z_0 + w^4 z_1 + w z_2 + w^5 z_3 + w^2 z_4 + w^6 z_5 + w^3 z_6 \\
 \rightarrow \sum_{s=0}^6 x_1(w_5 \cdot w_s) z_s &= x_1(w_5 \cdot w_0) z_0 + x_1(w_5 \cdot w_1) z_1 + x_1(w_5 \cdot w_2) z_2 + x_1(w_5 \cdot w_3) z_3 + \\
 &\quad x_1(w_5 \cdot w_4) z_4 + x_1(w_5 \cdot w_5) z_5 + x_1(w_5 \cdot w_6) z_6 \\
 &= x_1(5 \cdot 0) z_0 + x_1(5 \cdot 1) z_1 + x_1(5 \cdot 2) z_2 + x_1(5 \cdot 3) z_3 + x_1(5 \cdot 4) z_4 + \\
 &\quad x_1(5 \cdot 5) z_5 + x_1(5 \cdot 6) z_6 \\
 &= x_1(0) z_0 + x_1(5) z_1 + x_1(3) z_2 + x_1(1) z_3 + x_1(6) z_4 + x_1(4) z_5 + x_1(2) z_6 \\
 &= z_0 + w^5 z_1 + w^3 z_2 + w z_3 + w^6 z_4 + w^4 z_5 + w^2 z_6 \\
 \rightarrow \sum_{s=0}^6 x_1(w_6 \cdot w_s) z_s &= x_1(w_6 \cdot w_0) z_0 + x_1(w_6 \cdot w_1) z_1 + x_1(w_6 \cdot w_2) z_2 + x_1(w_6 \cdot w_3) z_3 + \\
 &\quad x_1(w_6 \cdot w_4) z_4 + x_1(w_6 \cdot w_5) z_5 + x_1(w_6 \cdot w_6) z_6 \\
 &= x_1(6 \cdot 0) z_0 + x_1(6 \cdot 1) z_1 + x_1(6 \cdot 2) z_2 + x_1(6 \cdot 3) z_3 + x_1(6 \cdot 4) z_4 + \\
 &\quad x_1(6 \cdot 5) z_5 + x_1(6 \cdot 6) z_6 \\
 &= x_1(0) z_0 + x_1(6) z_1 + x_1(5) z_2 + x_1(4) z_3 + x_1(3) z_4 + x_1(2) z_5 + \\
 &\quad x_1(1) z_6 \\
 &= z_0 + w^6 z_1 + w^5 z_2 + w^4 z_3 + w^3 z_4 + w^2 z_5 + w z_6
 \end{aligned}$$

• Persamaan Pencacah Bobot Lengkap

$Wc^T(z_0, z_1, z_2, z_3, z_4, z_5, z_6) = 1$	w_0	$z_0 + z_1 + z_2 + z_3 + z_4 + z_5 + z_6, z_0 + w z_1 + w^2 z_2 + w^3 z_3 + w^4 z_4 + w^5 z_5 + w^6 z_6, z_0 + w^2 z_1 + w^4 z_2 + w^6 z_3 + w z_4 + w^3 z_5 + w^5 z_6, z_0 + w^3 z_1 + w^6 z_2 + w^2 z_3 + w^5 z_4 + w z_5 + w^4 z_6, z_0 + w^4 z_1 + w z_2 + w^5 z_3 + w^6 z_4 + w^3 z_5 + w^2 z_6, z_0 + w^5 z_1 + w^3 z_2 + w z_3 + w^6 z_4 + w^4 z_5 + w^2 z_6, z_0 + w^6 z_1 + w^5 z_2 + w^4 z_3 + w^3 z_4 + w^2 z_5 + w z_6$
	$ c $	



LAMPIRAN 2

BERITA ACARA BIMBINGAN SKRIPSI



YAYASAN NURUL JADID PAITON
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BERITA ACARA BIMBINGAN SKRIPSI

1. Nama Mahasiswa : Imamatul Mukarramah
2. NIM : 2142200008
3. Prodi : Pendidikan Matematika
4. Judul Skripsi : Penerapan Teorema MacWilliams untuk Pencacah Bobot Lengkap pada Lapangan Galois ($GF(q)$)
5. Pembimbing : Nur Hamid, M.Si., Ph.D.
6. Konsultasi :

TANGGAL	MATERI BIMBINGAN	KETERANGAN KONSULTASI/ARAHAN	PARAF
21-11-2024	Materi teori kode	Mencari dan membahas materi terkait kode linier	<i>N. Hamid</i>
28-11-2024	Materi teori kode	Membahas materi terkait kode dual	<i>N. Hamid</i>
02-12-2024	Materi teori kode	Materi terkait kode self-dual dan identitas teorema MacWilliams	<i>N. Hamid</i>
05-12-2024	Materi teori kode	Membahas materi distribusi bobot dan pencacah bobot	<i>N. Hamid</i>
19-12-2024	Materi teori kode	Membahas teori invarian	<i>N. Hamid</i>
26-12-2024	Materi	Membahas polinomial Jacobi	<i>N. Hamid</i>
02-01-2025	Menentukan judul proposal	Judul : Pendekatan Invarian Polinomial Jacobi dan Identitas MacWilliams pada Kode Self-dual	<i>N. Hamid</i>
09-01-2025	Bab 1 dan 2	Pendahuluan dan pembahasan	<i>N. Hamid</i>
16-01-2025	ACC Bab 1-3		<i>N. Hamid</i>
13-02-2025	Merevisi judul	Menjadi : Pembuktian Teorema MacWilliams untuk Pencacah Bobot Lengkap	<i>N. Hamid</i>
27-02-2025	Membahas hasil	Mengkaji persamaan pencacah bobot lengkap dengan teorema MacWilliams	<i>N. Hamid</i>
17-04-2025	Membahas hasil	Membahas matriks hadamard dan transformasi hadamard untuk pembuktian	<i>N. Hamid</i>
24-04-2025	Membuat rancangan jurnal		<i>N. Hamid</i>



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27-04-2025	Menentukan rumah jurnal	Menggunakan rumah jurnal Eigen	<i>N. Hamid</i>
22-05-2025	Jurnal	Membuat jurnal	<i>N. Hamid</i>
29-05-2025	Jurnal	Membahas jurnal yang dibuat	<i>N. Hamid</i>
31-05-2025	Revisi judul	Judul : Penerapan Teorema MacWilliams untuk Pencacah Bobot Lengkap pada Lapangan Galois ($GF(q)$)	<i>N. Hamid</i>
04-06-2025	Hasil	Perhitungan persamaan pencacah bobot lengkap pada $GF(3)$	<i>N. Hamid</i>
12-06-2025	Hasil	Perhitungan persamaan pencacah bobot lengkap pada $GF(4)$	<i>N. Hamid</i>
15-06-2025	Hasil	Perhitungan persamaan pencacah bobot lengkap pada $GF(5)$ dan $GF(7)$	<i>N. Hamid</i>
19-06-2025	Menentukan rumah jurnal	Menggunakan rumah jurnal UJMC Unisda	<i>N. Hamid</i>
20-06-2025	Jurnal	Membuat jurnal	<i>N. Hamid</i>
22-06-2025	Jurnal	Submit Jurnal	<i>N. Hamid</i>
29-06-2025	Jurnal	Konfirmasi terkait surat LoA jurnal	<i>N. Hamid</i>
01-07-2025	Jurnal	Konfirmasi terkait jurnal telah dipublish	<i>N. Hamid</i>
03-07-2025	Bab 1-3	Konfirmasi terkait bab 1-3	<i>N. Hamid</i>
09-07-2025	Presentasi	Seminar hasil penelitian	<i>N. Hamid</i>
16-07-2025	Skripsi	Mendiskusikan skripsi dan memperbaiki error di overleaf	<i>N. Hamid</i>
19-07-2025	Skripsi	Menyampaikan hasil skripsi	<i>N. Hamid</i>
20-07-2025	PPT Skripsi	Menyampaikan hasil PPT skripsi	<i>N. Hamid</i>

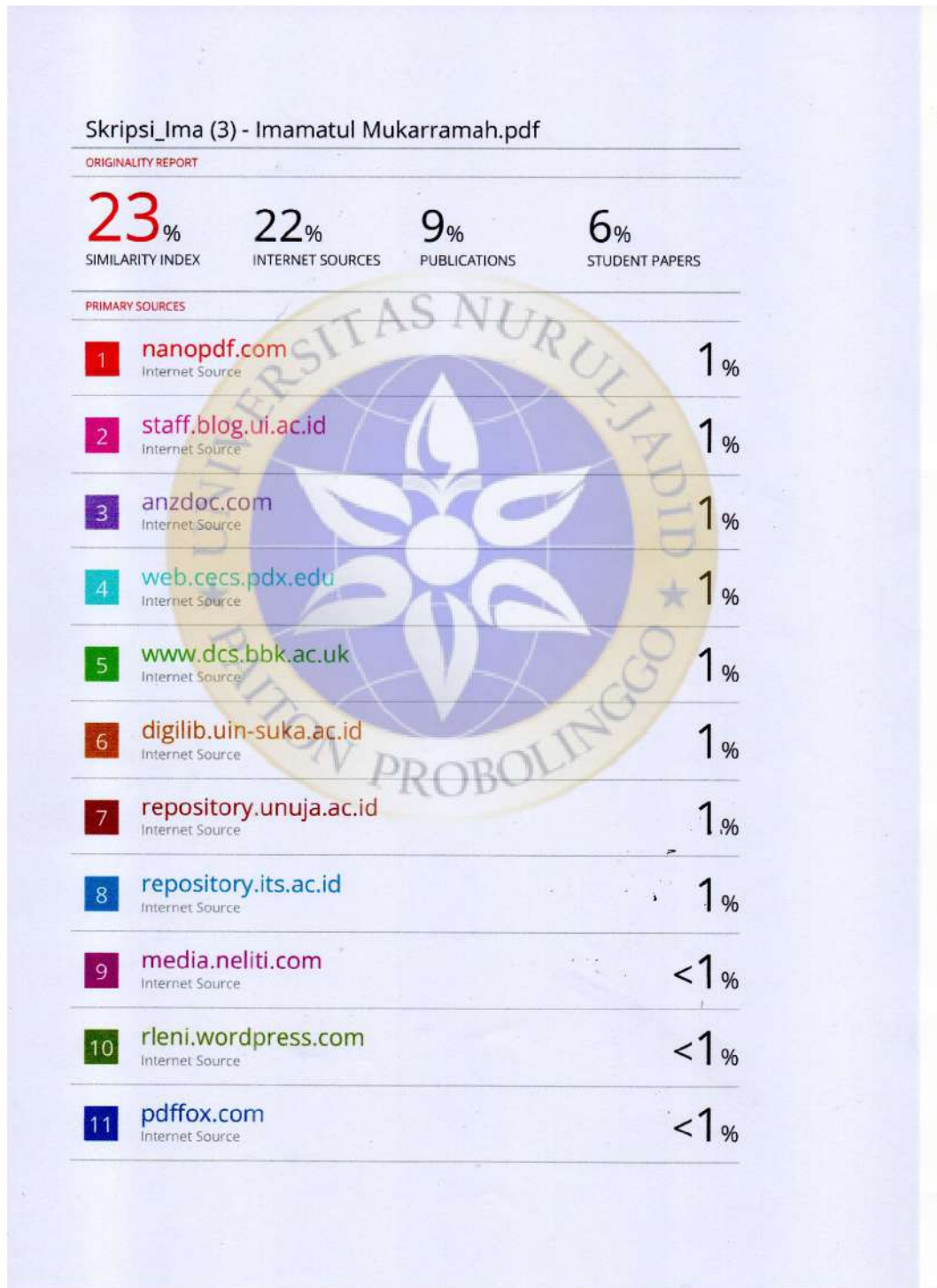
7. Bimbingan telah selesai pada tanggal 20 Juli 2025

Dosen Pembimbing,

Nur Hamid, M.Si., Ph.D.
NIDN : 0708019003

LAMPIRAN 3

BUKTI CEK SIMILARITY



RIWAYAT HIDUP



Imamatul Mukarramah, yang lahir pada tanggal 19 Mei 2003 adalah anak ketiga dari tiga bersaudara. Penulis berdomisili di Provinsi Bali tepatnya di Kabupaten Jembrana. Sejak kecil, penulis sudah memiliki ketertarikan dalam dunia seni, khususnya menggambar.

Perjalanan pendidikannya dimulai pada tahun 2007 di TK As-Syafi'iyah, kemudian melanjutkan ke Sekolah Dasar Negeri 1 Loloan Timur, lulus pada tahun 2015. Pendidikan menengah pertamanya di MTs Negeri 4 Jembrana dan selesai pada tahun 2018. Perjalanan akademik penulis mengarah pada pengembangan spritual dimulai saat memasuki pendidikan menengah atas. Di Madrasah Aliyah Nurul Jadid, Paiton, Probolinggo di bawah naungan Pondok Pesantren Nurul Jadid tepatnya di wilayah al-Hasyimiyah.

Setelah lulus pada tahun 2021, penulis melanjutkan studinya di Universitas Nurul Jadid, fakultas Sosial dan Humaniora, jurusan Pendidikan Matematika. Di saat yang sama, penulis tetap berada di lingkungan pesantren Nurul Jadid, namun kali ini berpindah ke wilayah al-Mawaddah. Di universitas ini, penulis berhasil menyelesaikan tugas akhir berjudul "Penerapan Teorema MacWilliams untuk Pencacah Bobot Lengkap pada Lapangan Galois ($GF(q)$)" sebagai salah satu syarat untuk menyelesaikan program Strata 1.

Penulis juga merupakan salah satu khadimah di Pondok Pesantren Nurul Jadid khususnya di wilayah al-Mawaddah. Kehidupan di pesantren dan di bangku kuliah memberikan warna tersendiri dalam perjalanan intelektual dan spritual penulis.