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**Prodi/Kelas : D4 Manajemen Informatika/2019A**

**Latihan:**

Dengan menggunakan algoritma dasar, **tentukan koordinat titik-titik digital untuk** garis yang dibentuk oleh dua titik sebagai berikut:

1. (-5,5) dan (1,2)

**Penyelesaian :**

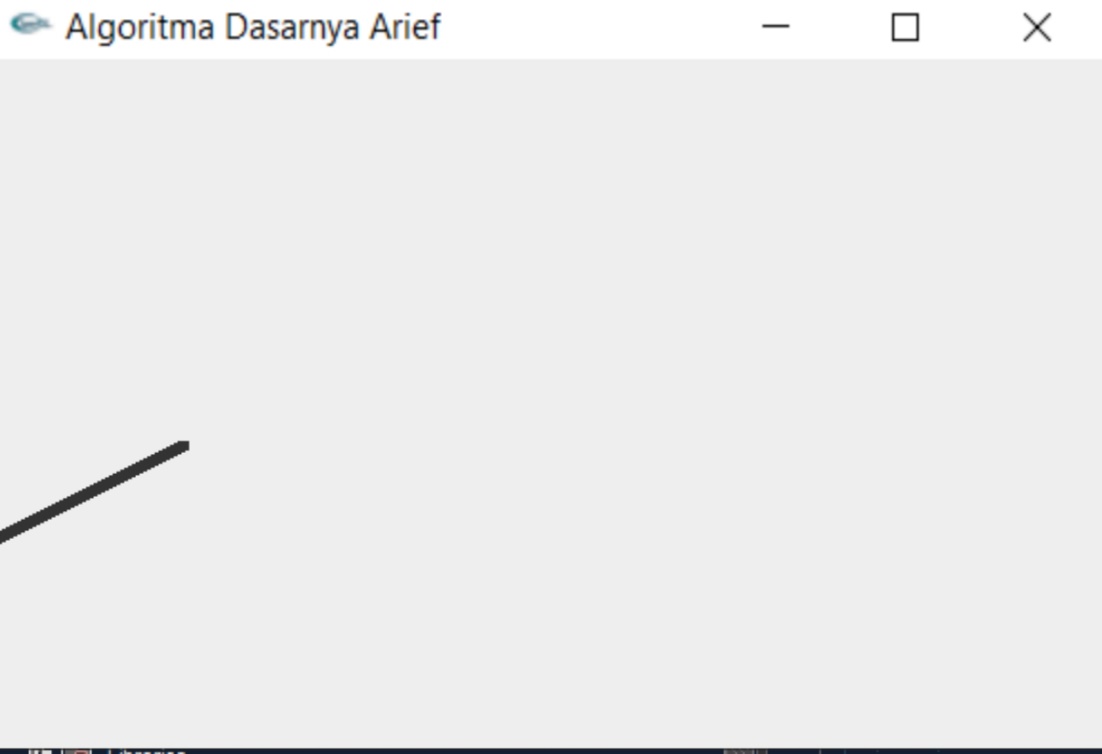
𝑚 = 𝑦2 − 𝑦1 = 2 −5 = −3 = − 0,5

# Maka :

𝑥2 − 𝑥1

1−(−5) 6

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **X** | **∆X** | **X\*** | **Y** | **∆Y** | **Y\*** | **[X]** | **[Y]** |
| -5 | - | -5 | 5 | - | 5 | -5 | 5 |
| -5 | 1 | -4 | 5 | -0,5 | 4,5 | -4 | 5 |
| -4 | 1 | -3 | 4,5 | -0,5 | 4 | -3 | 4 |
| -3 | 1 | -2 | 4 | -0,5 | 3,5 | -2 | 4 |
| -2 | 1 | -1 | 3,5 | -0,5 | 3 | -1 | 3 |
| -1 | 1 | 0 | 3 | -0,5 | 2,5 | 0 | 3 |
| 0 | 1 | 1 | 2,5 | -0,5 | 3 | 1 | 2 |



1. (4,3) dan (8,-2)

**Penyelesaian :**

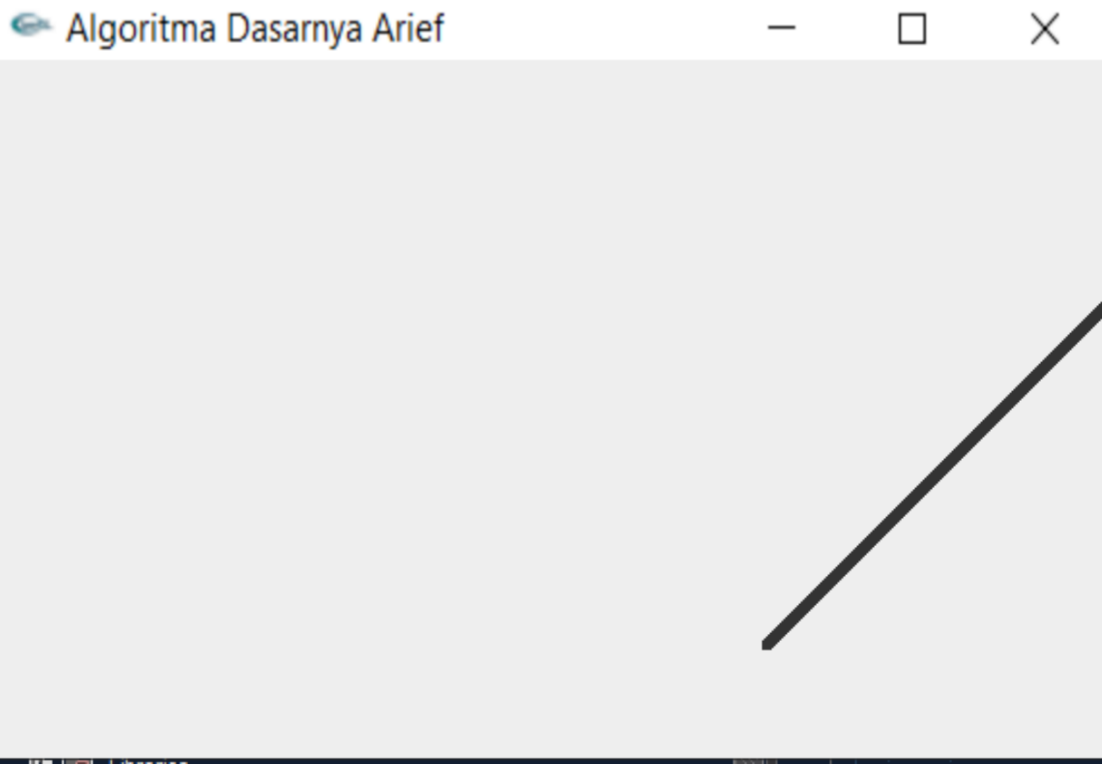
𝑚 = 𝑦2 − 𝑦1 = −2−3 = −5 = −1,25

# Maka :

𝑥2 − 𝑥1

8−4 4

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **X** | **∆X** | **X\*** | **Y** | **∆Y** | **Y\*** | **[X]** | **[Y]** |
| 4 | - | 4 | 3 | - | 3 | 4 | 3 |
| 4 | 1 | 5 | 3 | -1,25 | 1,75 | 5 | 2 |
| 5 | 1 | 6 | 1,75 | -1,25 | 0,5 | 6 | 1 |
| 6 | 1 | 7 | 0,5 | -1,25 | -0,75 | 7 | -1 |
| 7 | 1 | 8 | -0,75 | -1,25 | -2 | 8 | -2 |



1. (2,3) dan (5,3)

**Penyelesaian :**

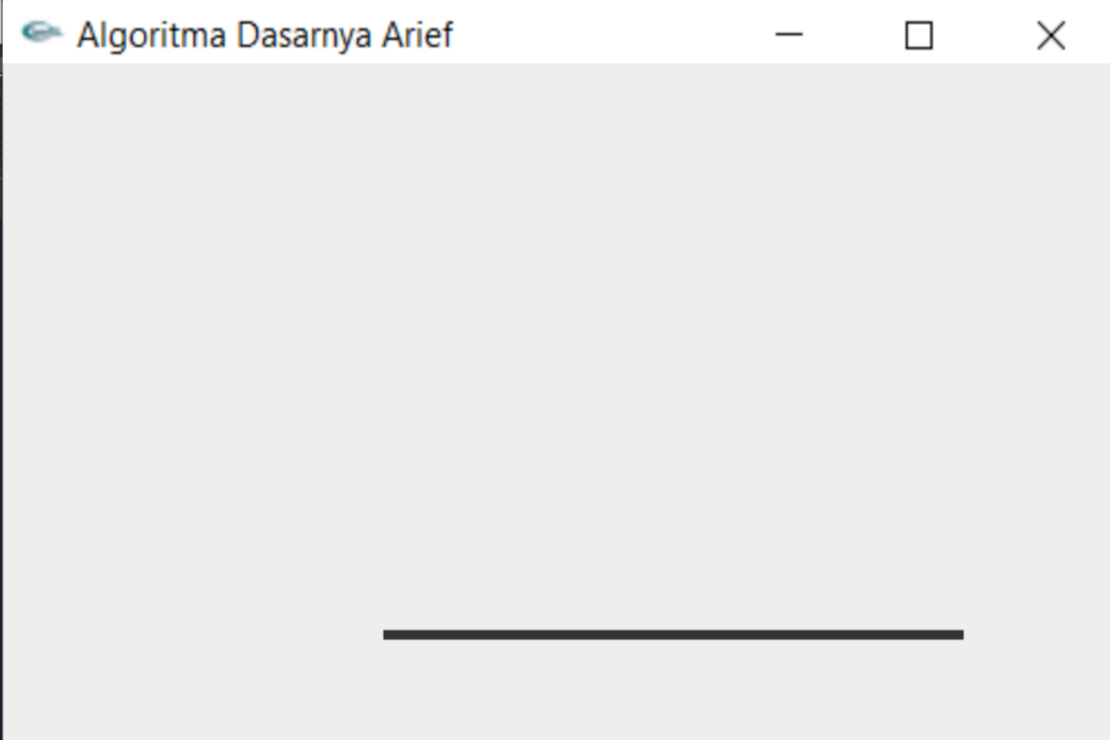
𝑚 = 𝑦2 − 𝑦1 = 3−3 = 0 = 0

# Maka :

𝑥2 − 𝑥1

5−2 3

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **X** | **∆X** | **X\*** | **Y** | **∆Y** | **Y\*** | **[X]** | **[Y]** |
| 2 | - | 2 | 3 | - | 3 | 2 | 3 |
| 2 | 1 | 3 | 3 | 0 | 3 | 3 | 3 |
| 3 | 1 | 4 | 3 | 0 | 3 | 4 | 3 |
| 4 | 1 | 5 | 3 | 0 | 3 | 5 | 3 |



1. (2,3) dan (2,5)

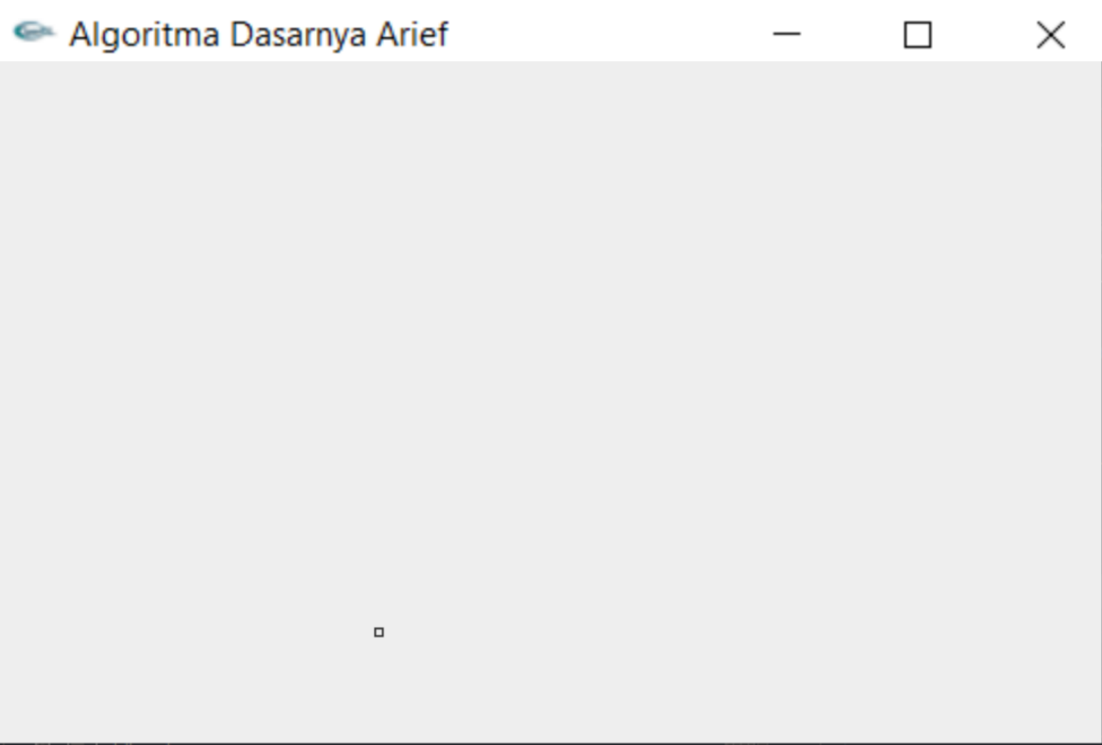
**Penyelesaian :**

𝑚 = 𝑦2 − 𝑦1 = 3−3 = 0 = 0

𝑥2 − 𝑥1 5−2 3

# Maka :

Titik Koordinat tidak ditemukan karena 𝑚 𝑎𝑡𝑎𝑢 ∆𝑌 bernilai Tak Hingga



1. (6,4) dan (2,1)

# Penyelesaian :

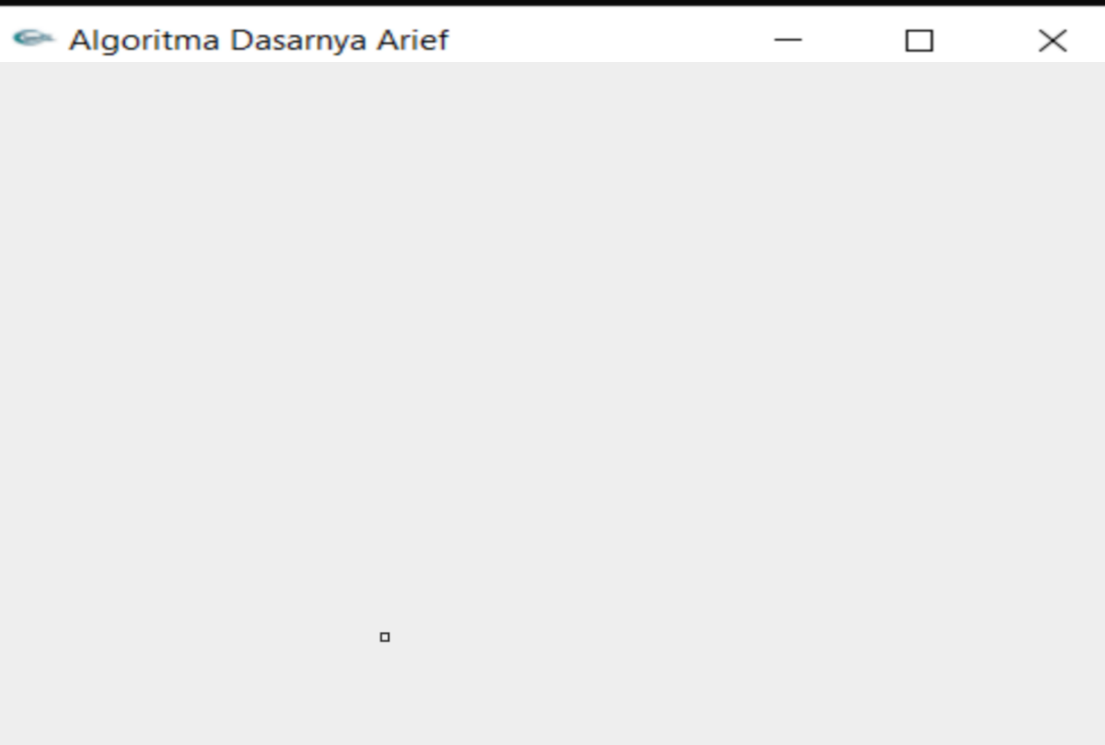
𝑚 = 𝑦2 − 𝑦1 = 1−4 = −3 = 0,75

𝑥2 − 𝑥1 2−6 −4

# Maka:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **X** | **∆X** | **X\*** | **Y** | **∆Y** | **Y\*** | **[X]** | **[Y]** |
| 6 | - | 6 | 4 | - | 4 | 6 | 4 |
| 6 | 1 | 7 | 4 | 0,75 | 4,75 | 7 | 5 |
| 7 | 1 | 8 | 4,75 | 0,75 | 5,5 | 8 | 6 |
| 8 | 1 | 9 | 5,5 | 0,75 | 6,25 | 9 | 6 |
| 9 | 1 | 10 | 6,25 | 0,75 | 7 | 10 | 7 |
| 10 | 1 | 11 | 7 | 0,75 | 7,75 | 11 | 8 |
| 11 | 1 | 12 | 7,75 | 0,75 | 8,5 | 12 | 9 |
| 12 | 1 | 13 | 8,5 | 0,75 | 9,25 | 13 | 9 |

Titik Koordinat tidak dapat ditemukan dikarenakan penjumlahan yang semakin besar dan tidak mengarah kepada Koordinat ke-2 (𝑋₂, 𝑌₂)



# Latihan:

Dengan menggunakan algoritma DDA, **tentukan koordinat titik-titik dijital untuk** garis yang dibentuk oleh dua titik sebagai berikut:

1. (-5,5) dan (1,2)

# Penyelesaian :

∆𝑥 = 𝑥1 − 𝑥0 = 1 − (−5) = 6

∆𝑦 = 𝑦1 − 𝑦0 = 2 − 5 = −3

Selanjutnya hitung dan bandingkan nilai absolutnya

|∆𝑥| = 6, |∆𝑦| = −3

Karena |∆𝑥| > |∆𝑦|, maka step = |∆𝑥| = 6, maka diperoleh :

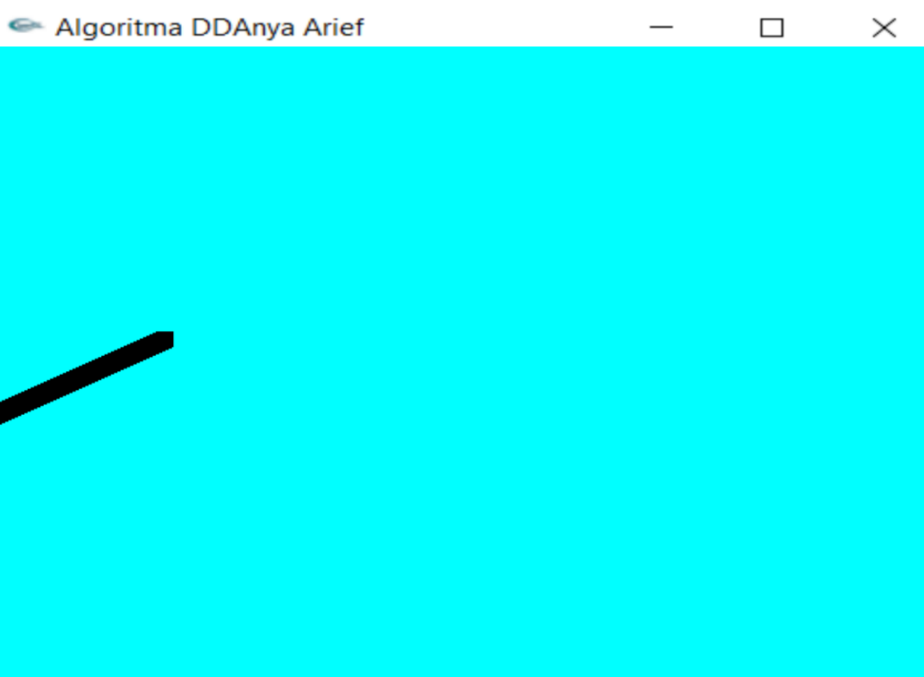
𝑥\_inc=6 = 1

6

𝑦\_inc=−3 = −0,5

6

|  |  |  |  |
| --- | --- | --- | --- |
| **k** | **x** | **y** | **round(x), round(y)** |
|  |  |  | (-5,5) |
| 0 | -4 | 4,5 | (-4,5) |
| 1 | -3 | 4 | (-3,4) |
| 2 | -2 | 3,5 | (-2,4) |
| 3 | -1 | 3 | (-1,3) |
| 4 | 0 | 2,5 | (0,3) |
| 5 | 1 | 2 | (1,2) |



1. (4,3) dan (8,-2)

# Penyelesaian :

∆𝑥 = 𝑥1 − 𝑥0 = 8 − (4) = 4

∆𝑦 = 𝑦1 − 𝑦0 = −2 − 3 = −5

Selanjutnya hitung dan bandingkan nilai absolutnya

|∆𝑥| = 4, |∆𝑦| = −5

Karena |∆𝑥| > |∆𝑦|, maka step = |∆𝑥| = 4, maka diperoleh :

𝑥\_inc=4 = 1

4

𝑦\_inc=−5 = −1,25

4

|  |  |  |  |
| --- | --- | --- | --- |
| **k** | **x** | **y** | **round(x), round(y)** |
|  |  |  | (4,3) |
| 0 | 5 | 1,75 | (5,2) |
| 1 | 6 | 0,75 | (6,1) |
| 2 | 7 | -0,25 | (7,0) |
| 3 | 8 | -1,5 | (8,-2) |



1. (2,3) dan (5,3)

# Penyelesaian :

∆𝑥 = 𝑥1 − 𝑥0 = 5 − 2 = 3

∆𝑦 = 𝑦1 − 𝑦0 = 3 − 3 = 0

Selanjutnya hitung dan bandingkan nilai absolutnya

|∆𝑥| = 3, |∆𝑦| = 0

Karena |∆𝑥| > |∆𝑦|, maka step = |∆𝑥| = 4, maka diperoleh :

𝑥\_inc=3 = 1

3

𝑦\_inc=0 = 0

3

|  |  |  |  |
| --- | --- | --- | --- |
| **k** | **x** | **y** | **round(x), round(y)** |
|  |  |  | (2,3) |
| 0 | 3 | 3 | (3,3) |
| 1 | 4 | 3 | (4,3) |
| 2 | 5 | 3 | (5,3) |



1. (2,3) dan (2,5)

# Penyelesaian :

∆𝑥 = 𝑥1 − 𝑥0 = 2 − 2 = 0

∆𝑦 = 𝑦1 − 𝑦0 = 5 − 3 = 2

Selanjutnya hitung dan bandingkan nilai absolutnya

|∆𝑥| = 0, |∆𝑦| = 2

Karena |∆𝑥| < |∆𝑦|, maka step = |∆𝑦| = 2, maka diperoleh :

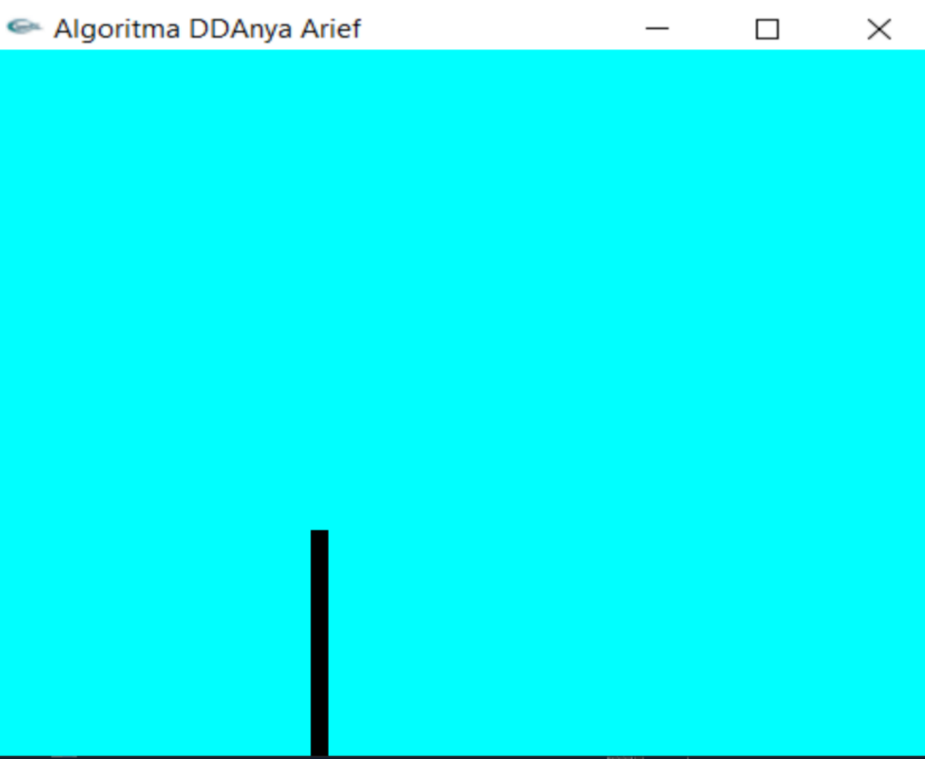
𝑥\_inc=0 = 0

2

𝑦\_inc=2 = 1

2

|  |  |  |  |
| --- | --- | --- | --- |
| **k** | **x** | **y** | **round(x), round(y)** |
|  |  |  | (2,3) |
| 0 | 2 | 4 | (3,3) |
| 1 | 2 | 5 | (4,3) |



1. (6,4) dan (2,1)

# Penyelesaian :

∆𝑥 = 𝑥1 − 𝑥0 = 2 − 6 = −4

∆𝑦 = 𝑦1 − 𝑦0 = 1 − 4 = −3

Selanjutnya hitung dan bandingkan nilai absolutnya

|∆𝑥| = −4, |∆𝑦| = −3

Karena |∆𝑥| < |∆𝑦|, maka step = |∆𝑦| = −3, maka diperoleh :

𝑥\_inc=−4 = 1,33

−3

𝑦\_inc=−3 = 1

−3

|  |  |  |  |
| --- | --- | --- | --- |
| **k** | **x** | **y** | **round(x), round(y)** |
|  |  |  | (6,4) |
| 0 | 7,33 | 5 | (7,5) |
| 1 | 8,66 | 6 | (9,6) |
| 2 | 9,99 | 7 | (10,7) |

Titik Koordinat tidak dapat ditemukan dikarenakan penjumlahan yang semakin besar dan tidak mengarah kepada Koordinat ke-2 (𝑋1, 𝑌1)

