FLOTING POINT

|  |  |  |
| --- | --- | --- |
| 1 bits | 8 bits | 23 bits |
|  |  |  |
| Sign  Positif = 0  Negative = 1 | eksponent | significat |

Rumus :

(-1) s **J ( in binery) x 2p**

**223**

Where :

S= 0 jika y 0 , dan S=1 Jika y > 1

Z = | Y |

P = Floor (log Z) = Floor ()

J = Round ( Z x 223-p)

Tugas ORKOM :

Ubalah nilai berikut ke dalam format floting point IEEE 754

1. 0.04
2. 0.0123
3. 936.35
4. -936.35
5. 0.125

**Answer**

1. Y = 0.04

Z = | 0.04 | = 0.0.4

P = Floor (log2 0.04) = floor () = floor (-4.64386) = -5

J = Round (0.04x 223-p) = round (0.04x223-(-5)) = round (10737418) 🡺hexsadesimal

= A3D70A 🡺 Biner

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| A | 3 | D | 7 | 0 | A |
| 1010 | 0011 | 1101 | 0111 | 0000 | 1010 |

(-1)s **J ( in binery) x 2p**

**223**

S = 0 Jika Y > 0

|  |  |  |
| --- | --- | --- |
| **1.** | **010 0011 1101 0111 0000 1010** | X 2-5 |

Significant 23 bits

Exsponent = -5 + 127 = 122 🡺 Biner

= 1111 010 🡺 7 Bit

Jika exsponent 7 bit maka ditambahkan bit nol didepanya sehingga menjadi 8 bit exsponent sehingga menghasilkan

|  |  |  |
| --- | --- | --- |
| **0** | **0111 1010** | **010 0011 1101 0111 0000 1010** |

0x7AA3D70A

Aktual nomor penyimpanan pada komputer yaitu :

Y = 0.04

(-1)s  = J = 10737418 = **0.04**

223-(-5)  228

1. Y = 0.0123

Z = | 0.0123 | = 0.0123

P = Floor (log2 0.0123) = floor () = floor (-6.34) = -7

J = Round (0.04x 223-p) = round (0.0123x223-(-7)) = round (13207024) 🡺hexsadesimal

= C985F0 🡺 Biner

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| C | 9 | 8 | 5 | F | 0 |
| 1100 | 1001 | 1000 | 0101 | 1111 | 0000 |

(-1)s **J ( in binery) x 2p**

**223**

S = 0 Jika Y > 0

|  |  |  |
| --- | --- | --- |
| **1.** | **100 1001 1000 0101 1111 0000** | X 2-7 |

Significant 23 bits

Exsponent = -7 + 127 = 120 🡺 Biner

= 1111 000 🡺 7 Bit

Jika exsponent 7 bit maka ditambahkan bit nol didepanya sehingga menjadi 8 bit exsponent sehingga menghasilkan

|  |  |  |
| --- | --- | --- |
| **0** | **0111 1000** | **100 1001 1000 0101 1111 0000** |

**0x7AA3D70A**

Aktual nomor penyimpanan pada komputer yaitu :

Y = 0.0123

(-1)s  = J = 13207024 = **0.0123**

223-(-7)  230

1. Y = 936.35

Z = | 936.35 | = 936.35

P = Floor (log2 936.35) = floor () = floor (**9**.870904088) = 9

J = Round (936.35x 223-p) = round (936.35x223-9) = round (15 341 158.4)

= round ( 15 341 154) 🡺 hexsadesimal

= EA1666🡺 Biner

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| E | A | 1 | 6 | 6 | 6 |
| 1110 | 1010 | 0001 | 0110 | 0110 | 0110 |

(-1)s **J ( in binery) x 2p**

**223**

S = 0 Jika Y > 0

|  |  |  |
| --- | --- | --- |
| **1.** | **110 1010 0001 0110 0110 0110** | X 29 |

Significant 23 bits

Exsponent = 9 + 127 = 136 🡺 Biner

= 1000 1000 🡺 8 Bit

|  |  |  |
| --- | --- | --- |
| **0** | **1000 1000** | **100 1010 0001 0110 0110 0110** |

0x88EA1666

Aktual nomor penyimpanan pada komputer yaitu :

Y = 936.35

(-1)s  = J = 15341158 = **936.3499756**

223-9  214

1. Y = -936.35

Z = | -936.35 | = 936.35

P = Floor (log2 936.35) = floor () = floor (**9**.870904088) = 9

J = Round (936.35x 223-p) = round (936.35x223-9) = round (15 341 158.4)

= round ( 15 341 154) 🡺 hexsadesimal

= EA1666🡺 Biner

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| E | A | 1 | 6 | 6 | 6 |
| 1110 | 1010 | 0001 | 0110 | 0110 | 0110 |

(-1)s **J ( in binery) x 2p**

**223**

S = 0 Jika Y > 0

|  |  |  |
| --- | --- | --- |
| **1.** | **110 1010 0001 0110 0110 0110** | X 29 |

Significant 23 bits

Exsponent = 9 + 127 = 136 🡺 Biner

= 1000 1000 🡺 8 Bit

|  |  |  |
| --- | --- | --- |
| **1** | **1000 1000** | **100 1010 0001 0110 0110 0110** |

**1x88EA1666**

Aktual nomor penyimpanan pada komputer yaitu :

Y = -936.35

(-1)s  = J = -15341158 = -**936.349976**

223-9  214

1. Y = 0.125

Z = | 0.125 | = 0.125

P = Floor (log2 0.125) = floor () = floor (-3) = -3

J = Round (0.125x 223-p) = round (0.125x223-(-3)) = round (8388608) 🡺hexsadesimal

= 800000 🡺 Biner

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 8 | 0 | 0 | 0 | 0 | 0 |
| 1000 | 0000 | 0000 | 0000 | 0000 | 0000 |

(-1)s **J ( in binery) x 2p**

**223**

S = 0 Jika Y > 0

|  |  |  |
| --- | --- | --- |
| **1.** | **000 0000 0000 0000 0000 0000** | X 2-3 |

Significant 23 bits

Exsponent = -3 + 127 = 124 🡺 Biner

= 1111 100 🡺 7 Bit

Jika exsponent 7 bit maka ditambahkan bit nol didepanya sehingga menjadi 8 bit exsponent sehingga menghasilkan

|  |  |  |
| --- | --- | --- |
| **0** | **0111 1100** | **000 0000 0000 0000 0000 0000** |

**0x8800000**

Aktual nomor penyimpanan pada komputer yaitu :

Y = 0.125

(-1)s  = J = 8388608 = **0.125**

223-(-3)  226

|  |  |  |  |
| --- | --- | --- | --- |
| HEXSADESIMAL | DESIMAL | BINER | OCTAT |
| 0 | 0 | 0000 | 0 |
| 1 | 1 | 0001 | 1 |
| 2 | 2 | 0010 | 2 |
| 3 | 3 | 0011 | 3 |
| 4 | 4 | 0100 | 4 |
| 5 | 5 | 0101 | 5 |
| 6 | 6 | 0110 | 6 |
| 7 | 7 | 0111 | 7 |
| 8 | 8 | 1000 | 10 |
| 9 | 9 | 1001 | 11 |
| A | 10 | 1010 | 12 |
| B | 11 | 1011 | 13 |
| C | 12 | 1100 | 14 |
| D | 13 | 1101 | 15 |
| E | 14 | 1110 | 16 |
| F | 15 | 1111 | 17 |