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Algoritma dan Struktur Data

**SOAL**

1. Write the algorithm of queue mechanism using

* Single linked list
* Array alternative 1
* Array alternative 2
* Array alternative 3

1. Use the same infotype as before
2. Each member is to write 1 mechanism

**PEMBAHASAN**

1. Single Linked List

Algoritma:

* Simpan 2 reference: front → … → … →back
* enqueue(Benda x):
* Buat sebuah node baru N yang datanya x
* if queue sebelumnya empty, maka front = back = N
* else tambahkan N di akhir (dan update back)
* dequeue():
* Hapus elemen pertama: front = front.next

1. Array alternative 1

Algoritma:

|  |
| --- |
| Add(P,3)  Add(P,4)  Add(P,2)  Del(P)  Del(P)  Add(P,5)  Del(P)  Del(P) |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 |
| 3 | 4 | 2 |  |  |

Head = 1

Tail = 3

Is empty = True

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 |
| 2 |  |  |  |  |

Head = 1

Tail = 0

Is empty = True

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 |
| 5 | 2 |  |  |  |

Head = 1

Tail = 2

Is empty = True

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 |
|  |  |  |  |  |

Head = 0

Tail = 0

Is empty = False

1. Array Alternative 2

Algoritma:

|  |
| --- |
| Add(P,3)  Add(P,4)  Add(P,2)  Del(P)  Del(P)  Add(P,5)  Del(P)  Add(P,6)  Add(P,7)  Del(P)  Del(P)  Del(P) |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 |
| 3 | 4 | 2 |  |  |

Head = 1

Tail = 3

Is empty = True

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 |
| 2 |  |  |  |  |

Head = 1

Tail = 0

Is empty = True

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 |
| 5 | 2 |  |  |  |

Head = 1

Tail = 2

Is empty = True

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 |
| 2 |  |  |  |  |

Head = 1

Tail = 0

Is empty = True

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 |
| 7 | 6 | 2 |  |  |

Head = 1

Tail = 3

Is empty = True

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 |
|  |  |  |  |  |

Head = 0

Tail = 0

Is empty = False

1. Array alternative 3

Algoritma:

|  |
| --- |
| Add(P,3)  Add(P,4)  Add(P,2)  Del(P)  Del(P)  Add(P,5)  Del(P)  Add(P,6)  Add(P,7)  Add(P,8)  Del(P)  Del(P)  Del(P)  Del(P) |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 |
| 3 | 4 | 2 |  |  |

Head = 1

Tail = 3

Is empty = True

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 |
| 2 |  |  |  |  |

Head = 1

Tail = 0

Is empty = True

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 |
| 5 | 2 |  |  |  |

Head = 1

Tail = 2

Is empty = True

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 |
| 2 |  |  |  |  |

Head = 1

Tail = 0

Is empty = True

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 |
| 8 | 7 | 6 | 2 |  |

Head = 1

Tail = 3

Is empty = True

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 |
|  |  |  |  |  |

Head = 0

Tail = 0

Is empty = False