

Smalltalk Lecture 6

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Add WeChat powcoder

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Queue in Collection hierarchy

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Collection subclass: #Queue.

Queue instanceVariableNames: 'list'.

Queue extend [<https://powcoder.com>
insert: key ["enqueue"
list **addLast:** key
]
remove ["dequeue"
list isEmpty ifTrue: [^ nil]
ifFalse: [^ list **removeFirst**]
]
]

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init and new

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Queue extend [Assignment Project Exam Help
display [list do: [:x | Transcript display: x; cr]]
init [list := **OrderedCollection** new]
]

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Queue **class** extend [
new [^ super new init]
]

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Client code

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q := Queue new.

q insert: 20; insert: 40; insert: 10; insert: 30.

q display.

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20

40

10

30

5 timesRepeat:

[Transcript display: q remove; cr].

20

40

10

30

nil

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do:

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```
Queue extend [
  do: aBlock [ list do: aBlock ]
  display [ self do: [:x] Transcript display: x; cr ] ]
]
```

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q := Queue new.

q insert: 20; insert: 40; insert: 10; insert: 30.

q display.

20
40
10
30

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collect:

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```
Queue extend [
  collect: aBlock [
    ^ Queue new list: (list collect: aBlock)
  ]
  list: aList [ list := aList ]
]
```

```
r := q collect: [ :x | x*x ].
r display.
```

400
1600
100
900

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select:

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Queue extend [Assignment Project Exam Help

select: aBlock ["filter"
^ Queue new list: (list select: aBlock)

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]

s := q select: [:x | x>15 and: [x<35]].

s display.

20

30

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reject:

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Queue extend [Assignment Project Exam Help

reject: aBlock [

^ Queue new list: (list reject: aBlock)

]

]

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t := q reject: [:x | x>15 and: [x<35]].

t display.

40

10

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inject:into: and detect:ifNone: (inherited from Collection)

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Transcript display: (q inject: 0 into: [:a :b | a+b]); cr.

100

Transcript display: (q inject: 1 into: [:a :b | a*b]); cr.

240000

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Transcript display: (q detect: [:x | x<15] ifNone: [99]); cr.

10

Transcript display: (q detect: [:x | x>25] ifNone: [99]); cr.

40

Transcript display: (q detect: [:x | x>50] ifNone: [99]); cr.

99

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BitSet class

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```
Collection subclass: BitSet [  
  | arr |  
  init: n [  
    arr := Array new: n.  
    1 to: n do: [ :k | arr at: k put: false ]  
  ]  
  init [ self init: 10 ]  
  size [ ^ arr size ]  
  display [ Transcript display: arr; cr ]  
]
```

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cardinality

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```
BitSet extend [
  cardinality [
    |n|
    n := 0.
    1 to: self size do: [ :k | (arr at: k) ifTrue: [ n := n+1 ] ].
    ^ n
  ]
]
```

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Client code

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set := BitSet new init <https://powcoder.com>
set display.
Transcript display: set cardinality; cr.

```
(false false false false false false false false false false )  
0
```

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insert:

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```
BitSet extend [
  insert: x [
    (self inRange: x)
    ifTrue: [ arr at: x put: true ]
    ifFalse: [ Transcript display: 'Error: out of range'; cr ]
  ]
  inRange: index [ ^ (1 <= index) and: [ index <= self size ] ]
]
```

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Client code

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1 to: set size by: 2 do: [k | set insert: k].

set display.

Transcript display: set cardinality; cr.

```
(true false true false true false true false true false )  
5
```

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remove:

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```
BitSet extend [ Assignment Project Exam Help  
  remove: x [ https://powcoder.com  
    (self inRange: x)  
      ifTrue: [ arr at: x put: false ]  
      ifFalse: [ Transcript display: 'Error: out of range'; cr ]  
    ]  
  ]
```

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Client code

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1 to: set size by: 3 do: [k | set remove: k].

set display.

Transcript display: set cardinality; cr.

```
(false false true false true false false false true false )  
3
```


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member:

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```
BitSet extend [
  member: x [
    (self inRange: x)
      ifTrue: [ ^ arr at: x ]
      ifFalse: [ ^ false ]
  ]
]
```

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Client code

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```
1 to: set size do: [:k |
```

```
Transcript display: k, space, display: (set member: k); cr  
].
```

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```
1 false  
2 false  
3 true  
4 false  
5 true  
6 false  
7 false  
8 false  
9 true  
10 false
```

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do: and inject:into:

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BitSet extend [

do: aBlock [1 to: arr size do:

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[:k | (arr at: k) ifTrue: [aBlock value: k]]

]

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]

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set do: [:x | Transcript display: x; cr].

3
5
9

Transcript display: (set inject: 0 into: [:a :b | a+b]); cr.

Transcript display: (set inject: 1 into: [:a :b | a*b]); cr.

17
135