

# position

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## Contents

### 1 Position

#### 1.1 service : **Position**

#### 1.2 types :int, boolean

#### 1.3 observators :

##### 1.3.1

- $x : [\text{Position}] \rightarrow \text{int}$
- $y : [\text{Position}] \rightarrow \text{int}$
- $z : [\text{Position}] \rightarrow \text{int}$
- $\text{dirG} : [\text{Position}] \rightarrow \text{boolean}$
- $\text{equals} : [\text{Position}] \times \text{Position} \rightarrow \text{boolean}$
- $\text{equals} : [\text{Position}] \times \text{int} \times \text{int} \times \text{int} \rightarrow \text{boolean}$

- $\text{collision} : [\text{Position}] \times \text{Position} \rightarrow \text{boolean}$

## 1.4 Constructors :

### 1.4.1

- $\text{init} : \text{int} \times \text{int} \times \text{int} \times \text{boolean} \rightarrow [\text{Position}]$

## 1.5 Operators :

### 1.5.1

- $\text{setX} : [\text{Position}] \times \text{int} \rightarrow [\text{Position}]$
- $\text{setY} : [\text{Position}] \times \text{int} \rightarrow [\text{Position}]$
- $\text{setZ} : [\text{Position}] \times \text{int} \rightarrow [\text{Position}]$
- $\text{setDir} : [\text{Position}] \times \text{boolean} \rightarrow [\text{Position}]$
- $\text{set} : [\text{Position}] \times \text{int} \times \text{int} \times \text{int} \rightarrow [\text{Position}]$
- $\text{set} : [\text{Position}] \times \text{Position} \rightarrow [\text{Position}]$

## 1.6 Observations :

### 1.6.1 [invariant]

- $\text{equals}(P, p2) =_{\text{def}} (x(P) = x(p2) \wedge y(P) = y(p2) \wedge z(P) = z(p2))$
- $\text{equals}(P, i, j, k) =_{\text{def}} (x(P) = i \wedge y(P) = j \wedge z(P) = k)$
- $\text{collision}(P, p2) =_{\text{def}} \text{equals}(P, p2) \vee \text{equals}(P, x(p2) - 1, y(p2), z(p2))$

- $\text{set}(P, p2) = \text{def set}(P, x(p2), y(p2), z(p2))$

### 1.6.2 [init]

- $x(\text{init}(i, j, k, d)) = i$
- $y(\text{init}(i, j, k, d)) = j$
- $z(\text{init}(i, j, k, d)) = k$
- $\text{dirG}(\text{init}(i, j, k, d)) = d$

### 1.6.3 [setX]

- $x(\text{setX}(P, n)) = n$
- $y(\text{setX}(P, n)) = y(P)$
- $z(\text{setX}(P, n)) = z(P)$
- $\text{dirG}(\text{setX}(P, n)) = \text{dirG}(P)$

### 1.6.4 [setY]

- $x(\text{setY}(P, n)) = x(P)$
- $y(\text{setY}(P, n)) = n$
- $z(\text{setY}(P, n)) = z(P)$
- $\text{dirG}(\text{setY}(P, n)) = \text{dirG}(P)$

#### 1.6.5 [setZ]

- $x(\text{setZ}(P, n)) = x(P)$
- $y(\text{setZ}(P, n)) = y(P)$
- $z(\text{setZ}(P, n)) = n$
- $\text{dirG}(\text{setZ}(P, n)) = \text{dirG}(P)$

#### 1.6.6 [setDir]

- $x(\text{setDir}(P, n)) = x(P)$
- $y(\text{setDir}(P, n)) = y(P)$
- $z(\text{setDir}(P, n)) = z(P)$
- $\text{dirG}(\text{setDir}(P, n)) = n$

#### 1.6.7 [set]

- $x(\text{set}(P, i, j, k)) = i$
- $y(\text{set}(P, i, j, k)) = j$
- $z(\text{set}(P, i, j, k)) = k$
- $\text{dirG}(\text{set}(P, i, j, k)) = \text{dirG}(P)$