Table 1: Instantiation of a **Distance** object using default values for the attributes.

Operation	Purpose	Object State	Expected Result
Distance d = new Distance()	To create a distance using the default values.	**feet = 1** **inches = 1**	A new Distance object with default values for the attributes.
d.getFeet()	To verify instantiation and accessor method.		1
d.getInches()	To verify instantiation and accessor method.		1

Table 2: Instantiation of a **Distance** object with legal, client-supplied values for the attributes.

Operation	Purpose	Object State	Expected Result
Distance d2 = new Distance(3, 5)	To create a distance using constructor values.	**feet = 3** **inches = 5**	A new Distance object with constructed values for the attributes.
d.getFeet()	To verify instantiation and accessor method.		3
d.getInches()	To verify instantiation and accessor method.		5

Table 3: Valid functionality of the getter & setter methods available.

Operation	Purpose	Object State	Expected Result
Distance d = new Distance()	To create a distance using the default values.	**feet = 1** **inches = 1**	A new Distance object with default values for the attributes.
d.getFeet()	To verify instantiation and accessor method.		1
d.getInches()	To verify instantiation and accessor method.		1
d.setFeet(3)	To ensure attributes get set properly.	**feet = 3** inches = 1	The Distance object contains the new value for feet.
d.setInches(5)	To ensure attributes get set properly.	feet = 3 **inches = 5**	The Distance object contains the new value for inches.
d.setFeet(-2)	To ensure validation of attributes.		FeetOutOfRangeException
d.setInches(-2)	To ensure validation of attributes.		InchesOutOfRangeException
Distance d2 = new Distance(3, 5)	To create a distance using constructor values.	**feet = 3** **inches = 5**	A new Distance object with constructed values for the attributes.
d2.getFeet()	To verify instantiation and accessor method.		3
d2.getInches()	To verify instantiation and accessor method.		5

Table 4: Valid functionality of the addition and subtraction methods for the **Distance** object.

Operation	Purpose	Object State	Expected Result
Distance d = new Distance()	To create a distance using the default values.	**feet = 1** **inches = 1**	A new Distance object with default values for the attributes.
Distance d2 = new Distance(3, 5)	To create a distance using constructed values.	**feet = 3** **inches = 5**	A new Distance object with default values for the attributes.
Distance d3 = Distance.add(d, d2)	To ensure two distances can be added together	**feet = 4** **inches = 6**	A new Distance object with attribute values equivalent to the sum of object properties.
Distance d4 = Distance.subtract(d2, d)	To ensure two distances can be subtracted from each other	**feet = 2** **inches = 4**	A new Distance object with attribute values equivalent to the difference of object properties.
Distance d4 = Distance.subtract(d, d2)	To ensure two distances subtracted from each other cannot create an invalid object		FeetOutOfRangeException — InchesOutOfRangeException

Table 5: Valid functionality of equality & hash code methods for the **Distance** object.

Operation	Purpose	Object State	Expected Result
Distance d = new Distance()	To create a distance using the default values.	**feet = 1** **height = 1**	A new Distance object with default values for the attributes.
Distance d2 = new Distance()	To create a distance using constructed values.	**feet = 3** **height = 5**	A new Distance object with constructed values for the attributes.
Distance d3 = new Distance()	To create a distance using default values.	**feet = 1** **height = 1**	A new Distance object with default values for the attributes.
d.equals(d2)	To verify two distances are not equal.		False
d.equals(d3)	To verify two distances are equal.		True
d.hashCode()	To verify the hash code function.		31285
d.hashCode() == d2.hashCode()	To verify two hash codes do not match.		False
d.hashCode() == d3.hashCode()	To verify two equal objects have hash codes that match.		True

Table 6: Valid functionality of the comparability of the **Distance** object.

Operation	Purpose	Object State	Expected Result
Distance d = new Distance()	To create a distance using the default values.	**feet = 1** **inches = 1**	A new Distance object with default values for the attributes.
Distance d2 = new Distance()	To create a distance using constructed values.	**feet = 3** **height = 5**	A new Distance object with constructed values for the attributes.
Distance d3 = new Distance()	To create a distance using default values.	**feet = 1** **height = 1**	A new Distance object with default values for the attributes.
d.compareTo(d2)	To verify a distance compares less than another.		-1
d.compareTo(d3)	To verify a distance compares the same as another.		0
d2.compareTo(d)	To verify a distance compares greater than another.		1