CSE 4321 Homework 2

# Chapter 6

## Exercise 3

1. Let’s consider a list x with 1 element:

x = [2];

The location of element 2 is in Block 1: element is first entry in list and the location of element 2 is also in Block 2: element is last entry in list. Therefore, the list x = [2] fails the disjointness property since 2 is in two blocks.

1. Let’s consider a list x to be an empty set, that doesn’t contain any elements:

x = ∅;

The empty set element doesn’t agree with Block 1, nor Block 2, or Block 3. Therefore, the empty set element fails the completeness property since empty set doesn’t fall into any of the blocks.

1. We need to add two more partitions in order not to suffer from completeness or disjointness problems.

Block 4: element is both the first and last entry in list

Block 5: list is empty set

## Exericse 4

1. Here the abstract state variable is ‘stack’ which signifies the stack of objects.

There is another abstract state variable called ‘sz’ to signify the stack’s size.

We have size in constructor and variable x in the method push().

1. Characteristics of the input variables

* Whether the Stack is empty.
* What is the present size?
* What the sz is?
* Are there any null values in the Stack?
* In the constructor the variable size can possess “illegal” values
* It isn’t clear size too have such “illegal” values; thus this makes a fine test characteristic.

1. Characteristics of the inputs

* Is there any null values in the inputs?
* What is the size of the inputs?

1. Blocks and base blocks

Whether the stack is empty.

i1: true (stack = [])

i2: false (stack = [‘a’,’b’]) Base block

Size of the stack

i1: 0 (stack = [])

i2: 1 (stack = [‘a’])

i3: more than 1 (stack = [‘a’,’b’,’c’]) Base block

value of sz

i1: negative(size = -1) (may not be possible)

i2: 0 (size = 0) (also may not be possible)

i3: 1 (size = 1)

i4: more than 1 (size = 2) Base block

value of size

i1: negative (size = -1) -> (may not be possible)

i2: 0 (size = 0) (also may not be possible)

i3: 1 (size = 1)

i4: more than 1 (size = 2) Base Block

Whether the variable X is null

i1: true (x = NULL)

i2: false (x = ‘a’) Base block

1. Let’s assume we are testing push(Object X) as it makes the input parameter x

Note that size in the constructor isn’t relevant to this test sets, though the constructor will be certainly called in the setup for the tests.

This means we will skip the 1st, 2nd, 3rd, and 4th blocks while defining the base tests for push(Object X).

The base test = [a2, b2, c3, d4, f2]

[a1, b2, c3, d4, f2]

[a2, b1, c3, d4, f2]

[a2, b2, c1, d4, f2]

[a2, b2, c2, d4, f2]

[a2, b2, c3, d4, f2]

[a2, b2, c3, d1, f2]

[a2, b2, c3, d2, f2]

[a2, b2, c3, d3, f2]

[a2, b2, c3, d4, f1]