COM2108 Functional Programming Assignment 1

**Testing**

|  |  |  |  |
| --- | --- | --- | --- |
| Function | Test Case | Function Call | Result |
| listToBag | List with one element | listToBag ["A"] | [("A",1)] |
|  | List with multiple elements in order | listToBag ["A","A","B"."B","C"] | [("A",2),( "B",2),( "C",1)] |
|  | List with multiple elements out of order | listToBag ["A","B","A","C","A","B","D"] | [("A",3),("B",2),("C",1),("D",1)] |
|  | Empty list | listToBag [] | Controlled exception: Empty list |
|  |  |  |  |
| bagEqual | Two empty bags entered | bagEqual [] [] | True |
|  | One empty bag entered | bagEqual [("A",1)] []  *and*  bagEqual [] [("A",1)] | In both cases: False |
|  | Equal bags | bagEqual [("A",4),("B",3)] [("A",4),("B",3)] | True |
|  | Equal bags in different order | bagEqual [("A",4),("B",3)] [("B",3),("A",4)] | True |
|  | Unequal bags | bagEqual [("A",4),("B",3)] [("B",3),("A",10)]  *and*  bagEqual [("A",4),("B",3)] [("B",3),("A",10),("C",2)] | In both cases: False |
|  |  |  |  |
| bagInsert | Insert new item into empty bag | bagInsert [] 5 | [(5,1)] |
|  | Insert item that already exists | bagInsert [("P",1),("I",9),("K",9),("A",5)] "A" | [("P",1),("I",9),("K",9),("A",6)] |
|  | Insert item that does not already exist | bagInsert [("P",1),("I",3),("K",2)] "A" | [("P",1),("I",3),("K",2),("A",1)] |
|  |  |  |  |
| bagSum | Two empty bags entered | bagSum [] [] | [] |
|  | Bags with same elements entered | bagSum [("A",5),("B",2)] [("A",5),("B",2)] | [("A",10),("B",4)] |
|  | Bags with different elements entered | bagSum [("A",2),("B",7)] [("C",2)] | [("A",2),("B",7),("C",2)] |
|  | Bag containing items and empty bag entered | bagSum [] [("A",2)]  *and*  bagSum [("A",2)] [] | In both cases: [("A",2)].  In the original test an error was discovered: corrected with an extra function. |
|  |  |  |  |
| bagIntersection | Two empty bags entered | bagIntersection [] [] | Controlled exception: Bags are empty |
|  | Bags with same elements entered | bagIntersection [(1,2),(2,5)] [(1,2),(2,5)] | [(1,2),(2,5)] |
|  | Bags with different elements (equal element in both) | bagIntersection [("A",7),("C",4)] [("A",2),("B",4)] | [("A",2)] |
|  | Bag containing items and empty bag entered | bagIntersection [("A",2)] []  *and*  bagIntersection [] [("A",2)] | In both cases: [] |
|  |  |  |  |