Assignment 2

Code:

```
class SetADT:
    def __init__(self):

        self.elements = {}
    def add(self, element):

        self.elements[element] = None
    def remove(self, element):
        if element in self.elements:
            del self.elements[element]
        else:
            raise KeyError(f"Element {element} not found in the set")
    def contains(self, element):

        return element in self.elements
    def size(self):

        return len(self.elements)
    def iterator(self):

        return iter(self.elements)
    def intersection(self, other_set):

        result = SetADT()
        for element in self.elements:
            if other_set.contains(element):
                result.add(element)
        return result
    def union(self, other_set):

        result = SetADT()
        for element in self.elements:
            result.add(element)
        for element in other_set.elements:
            result.add(element)
        return result
    def difference(self, other_set):

        result = SetADT()
        for element in self.elements:
            if not other_set.contains(element):
                result.add(element)
        return result
    def subset(self, other_set):

        for element in self.elements:
            if not other_set.contains(element):
                return False
        return True

if __name__ == "__main__":
    set1 = SetADT()
    set1.add(1)
    set1.add(2)
    set1.add(3)
    set2 = SetADT()
    set2.add(2)
```

```
    set2.add(3)
    set2.add(4)
    print("Set 1 contains 2:", set1.contains(2))
    print("Set 1 size:", set1.size())
    set1.remove(2)
    print("Set 1 after removing 2:", [x for x in set1.iterator()])
    union_set = set1.union(set2)
    print("Union of Set 1 and Set 2:", [x for x in union_set.iterator()])

    intersection_set = set1.intersection(set2)
    print("Intersection of Set 1 and Set 2:", [x for x in
intersection_set.iterator()])

    difference_set = set1.difference(set2)
    print("Difference of Set 1 and Set 2:", [x for x in
difference_set.iterator()])

    print("Is Set 1 a subset of Set 2?", set1.subset(set2))
    print("Is Set 2 a subset of Set 1?", set2.subset(set1))
```

Output: