MP2. Dynamic Memory Management and Data Type
Deadline: January 11, 2021 on AnimoSpace

Write a program that will define the data type and operations of an Ordered Set. A set is a collection of distinct or unique values. Since this set is ordered, its elements are arranged in ascending order. A set is an example of a dynamic data structure where the collection of **data** in memory has the flexibility to grow or shrink in size. The basic operations of sets include the following:

1. **`Set create()`** : returns an empty set
2. **`Set add (Set s, e)`**: adds e to the Set s, and returns the pointer to the first element of Set s
3. **`Set union (Set s1, Set s2)`**: returns a new ordered Set created by merging the elements of sets S1 and S2.
4. **`Set intersection (Set s1, Set s2`**): returns a new ordered Set containing the common elements of sets S1 and S2.
5. **`Set difference (Set s1, Set s2)`**: returns a new ordered Set containing the unique elements in S1, that are not found in S2.
6. **`void print (Set s)`**: displays on screen the elements of the ordered Set s.

The ordered set will be implemented in C as a linked list. You may refer to the CCPROG2 course notes for a tutorial on linked lists. Test your program using the following statements:

```
Set s1, s2, s3;

s1 = create();
s2 = create();
s3 = create();

add (s1, 4);
add (s1, 2);
add (s1, 8);
add (s1, 6);
print (s1);   // this statement will display (2, 4, 6, 8)
add (s2, 2);
add (s2, 5);
print (s2); // this statement will display (2, 5)
add (s3, 7);
add (s3, 6);
print (s3) // this statement will display (6, 7)
```

```
print (union(s1, s2)); // this statement will return (2, 4, 5, 6, 8)
print (intersect(s1, s2)); // this statement will return (2)
print (difference(s1, s3)); // this statement will return (2, 4, 8)
print (intersection(s2, s3)); // this statement will return ()
print (union(s2, s3)); // this statement will return (2, 5, 6, 7)
```

Submission format: Upload the source code (.c file) on AnimoSpace. Make sure the source code has appropriate documentation through the form the comments.