CSI 32 LECTURE NOTES (Ojakian)

Topic 11: Iterators

OUTLINE
PRIMER: 3.4, 9.1, 9.2
TRANSITION GUIDE: 10.1, 10.2, 10.3

1. Container Types
2. Iterators

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1. In General: Container Types and Iterators

(a) Examples: Lists, Vectors, Dictionaries, Sets, etc

(b) A data type which contains collections of some other data type.

(c) Iterator: An object used to traverse all the objects in a container type.

(d) Object is iterable: If there is a way to return the elements one by one, till you get all the elements.

2. Iterators in Python

(a) Call `iter` function to get an iterator.

(b) Call `next` function to get next element.

(c) `StopIteration` exception thrown if no next element

(d) Recall Python Sets: add, remove, len.

PROBLEM 1. *Write a program to iterate through a list and through a set, first manually, and then with a while loop.*

3. Iterators in C++

(a) Instead of `iter`: Declare TYPE::iterator

(b) Instead of `next` ....

i. Use "++" to advance the position

ii. Use "*" to access current contents (for read or write)

iii. Use .begin() and .end() on the original object to get the first and last item.

PROBLEM 2. *Do the above Python iteration in C++*