CS318 – Project 05 – Circular Buffer

Due Date is posted on Blackboard.

Specifications:

- Create a C++ project for a circular buffer.
- Refer to here for a general description: ***https://en.wikipedia.org/wiki/Circular_buffer***
- Refer to this document for a visual representation of the operation: ***P05 CircularBufferExample.pdf***

Project Requirements

- The circular buffer you develop will not recognize buffer overflow but will write over the oldest data.
- Uses a templated class which employs the ***std:array*** from STL.
- Use only the starter files provided.
- Further requirements are provided as comments in the starter files which will be discussed during class.

Follow specifications for submitting projects – CS318 C++ Programming Project Submission Requirements.pdf

Sample Run – Your code should produce this output exactly including spacing and alignment.

********** <int> Circular Buffer Demo **********

Initial state
Buffer Info: head: 0, tail: 0, current: 0, capacity: 5, size: 0
  Container: -858993460 -858993460 -858993460 -858993460 -858993460

Pushing 0
Buffer Info: head: 0, tail: 0, current: 1, capacity: 5, size: 1
  Container: 0 -858993460 -858993460 -858993460 -858993460

Pushing 10
Buffer Info: head: 0, tail: 1, current: 2, capacity: 5, size: 2
  Container: 0 10 -858993460 -858993460 -858993460

Pushing 20
Buffer Info: head: 0, tail: 2, current: 3, capacity: 5, size: 3
  Container: 0 10 20 -858993460 -858993460

Pushing 30
Buffer Info: head: 0, tail: 3, current: 4, capacity: 5, size: 4
  Container: 0 10 20 30 -858993460

Pushing 40
Buffer Info: head: 0, tail: 4, current: 0, capacity: 5, size: 5
  Container: 0 10 20 30 40

Pushing 50
Buffer Info: head: 1, tail: 0, current: 1, capacity: 5, size: 5
  Container: 50 10 20 30 40

Pushing 60
Buffer Info: head: 2, tail: 1, current: 2, capacity: 5, size: 5
  Container: 50 60 20 30 40

Pushing 70
Buffer Info: head: 3, tail: 2, current: 3, capacity: 5, size: 5
  Container: 50 60 70 30 40

Popping: 30
Buffer Info: head: 4, tail: 2, current: 3, capacity: 5, size: 4
  Container: 50 60 70 30 40

Popping: 40
Buffer Info: head: 0, tail: 2, current: 3, capacity: 5, size: 3
  Container: 50 60 70 30 40

Popping: 50
Buffer Info: head: 1, tail: 2, current: 3, capacity: 5, size: 2
  Container: 50 60 70 30 40

Popping: 60
Buffer Info: head: 2, tail: 2, current: 3, capacity: 5, size: 1
  Container: 50 60 70 30 40

Popping: 70
Buffer Info: head: 3, tail: 2, current: 3, capacity: 5, size: 0
  Container: 50 60 70 30 40

********** <string> Circular Buffer Demo **********

Initial state
Buffer Info: head: 0, tail: 0, current: 0, capacity: 5, size: 0
  Container:

After using back_insert_iterator
Buffer Info: head: 2, tail: 1, current: 2, capacity: 5, size: 5
  Container: of oz the wonderful world

Popping: the
Buffer Info: head: 3, tail: 1, current: 2, capacity: 5, size: 4
  Container: of oz the wonderful world

Popping: wonderful
Buffer Info: head: 4, tail: 1, current: 2, capacity: 5, size: 3
  Container: of oz the wonderful world

Popping: world
Buffer Info: head: 0, tail: 1, current: 2, capacity: 5, size: 2
  Container: of oz the wonderful world

Popping: of
Buffer Info: head: 1, tail: 1, current: 2, capacity: 5, size: 1
  Container: of oz the wonderful world

Popping: oz
Buffer Info: head: 2, tail: 1, current: 2, capacity: 5, size: 0
  Container: of oz the wonderful world

********** <Dog> Circular Buffer Demo **********

```
Buffer Info: head: 0, tail: 4, current: 0, capacity: 5, size: 5
  Container:
      Guinness, Wheaten, 9
      Grimlock, Lab, 2
      Optimus, Bulldog, 5
      Murphy, Lab, 14
      Floyd, Beagle, 12

dogs Full?: true

Buffer Info: head: 1, tail: 0, current: 1, capacity: 5, size: 5
  Container:
      Snoopy, Beagle, 100
      Grimlock, Lab, 2
      Optimus, Bulldog, 5
      Murphy, Lab, 14
      Floyd, Beagle, 12

Buffer Info: head: 2, tail: 1, current: 2, capacity: 5, size: 5
  Container:
      Snoopy, Beagle, 100
      Archie, Brittany, 1
      Optimus, Bulldog, 5
      Murphy, Lab, 14
      Floyd, Beagle, 12

Buffer Info: head: 3, tail: 2, current: 3, capacity: 5, size: 5
  Container:
      Snoopy, Beagle, 100
      Archie, Brittany, 1
      Penny, Beagle, 2
      Murphy, Lab, 14
      Floyd, Beagle, 12

Popping:
      Murphy, Lab, 14

Buffer Info: head: 4, tail: 2, current: 3, capacity: 5, size: 4
  Container:
      Snoopy, Beagle, 100
      Archie, Brittany, 1
      Penny, Beagle, 2
      Murphy, Lab, 14
      Floyd, Beagle, 12

Popping:
      Floyd, Beagle, 12

Buffer Info: head: 0, tail: 2, current: 3, capacity: 5, size: 3
  Container:
      Snoopy, Beagle, 100
      Archie, Brittany, 1
      Penny, Beagle, 2
```

Murphy, Lab, 14
Floyd, Beagle, 12

Popping:
Snoopy, Beagle, 100

Buffer Info: head: 1, tail: 2, current: 3, capacity: 5, size: 2
Container:
Snoopy, Beagle, 100
Archie, Brittany, 1
Penny, Beagle, 2
Murphy, Lab, 14
Floyd, Beagle, 12

Popping:
Archie, Brittany, 1

Buffer Info: head: 2, tail: 2, current: 3, capacity: 5, size: 1
Container:
Snoopy, Beagle, 100
Archie, Brittany, 1
Penny, Beagle, 2
Murphy, Lab, 14
Floyd, Beagle, 12

Popping:
Penny, Beagle, 2

Buffer Info: head: 3, tail: 2, current: 3, capacity: 5, size: 0
Container:
Snoopy, Beagle, 100
Archie, Brittany, 1
Penny, Beagle, 2
Murphy, Lab, 14
Floyd, Beagle, 12