

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: 5, 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

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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 *****

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Buffer Info: head: 0, tail: 4, current: 5, 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

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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