Project Setup and Execution Guide for Infinite & Finite Buffer

Introduction

This document provides a comprehensive guide to compile and run the InfiniteBuffer.cpp and FiniteBuffer.cpp programs that demonstrate synchronized producer-consumer behavior with graphical visualization using SFML.

System Requirements

Required Tools

Tool	Purpose
g++	Compile C++ code
make	Automate build process
SFML	Used for visualization in the project

Install SFML

On Ubuntu/Debian (Linux):

```
sudo apt update
sudo apt install libsfml-dev
```

On macOS (Homebrew):

```
brew install sfml
```

On Windows:

Download SFML from https://www.sfml-dev.org/download/sfml/2.6.1/

Extract SFML.
For compilation using g++ from command line:

```
g++ InfiniteBuffer.cpp -o infinite_buffer -IC:/Path/To/SFML/include -
LC:/Path/To/SFML/lib -lsfml-graphics -lsfml-window -lsfml-system -pthread
g++ FiniteBuffer.cpp -o finite_buffer -IC:/Path/To/SFML/include -LC:/Path/To/SFML/lib -
lsfml-graphics -lsfml-window -lsfml-system -pthread
```

Folder Structure

/buffer-project
├── Makefile
├── InfiniteBuffer.cpp
├── FiniteBuffer.cpp
├── arial.ttf

Compilation Using Makefile

Makefile

```
CXX = g++
CXXFLAGS = -std=c++17 -Wall -O2 -pthread
SFML_FLAGS = -lsfml-graphics -lsfml-window -lsfml-system

INFINITE_TARGET = infinite_buffer
FINITE_TARGET = finite_buffer

INFINITE_SRC = InfiniteBuffer.cpp
FINITE_SRC = FiniteBuffer.cpp

all: $(INFINITE_TARGET) $(FINITE_TARGET)

$(INFINITE_TARGET): $(INFINITE_SRC)
	$(CXX) $(CXXFLAGS) -o $@ $^ $(SFML_FLAGS)

$(FINITE_TARGET): $(FINITE_SRC)
	$(CXX) $(CXXFLAGS) -o $@ $^ $(SFML_FLAGS)

run-infinite: $(INFINITE_TARGET)
	./$(INFINITE_TARGET)

run-finite: $(FINITE_TARGET)
	./$(FINITE_TARGET)

clean:
	rm -f $(INFINITE_TARGET) $(FINITE_TARGET) *.o *.txt
```

Running the Code

On Linux/macOS (with Makefile)

make
make run-infinite
make run-finite
make clean

On Windows (with Makefile if make is installed)

make
make run-infinite
make run-finite
make clean

On Windows (without Makefile)

g++ InfiniteBuffer.cpp -o infinite_buffer -IC:/Path/To/SFML/include -LC:/Path/To/SFML/lib -lsfml-graphics -lsfml-window -lsfml-system -pthread
g++ FiniteBuffer.cpp -o finite_buffer -IC:/Path/To/SFML/include -LC:/Path/To/SFML/lib -lsfml-graphics -lsfml-window -lsfml-system -pthread

Run executables:

infinite_buffer.exe
finite_buffer.exe

(Note: Ensure .dll files from SFML bin/ folder are copied into your executable folder or available in PATH.)

Output Files

File Name	Purpose
InfiniteBufferLogger.txt	Logs for Infinite Buffer operations
FiniteBufferLogger.txt	Logs for Finite Buffer operations
infinite_buffer	Executable for infinite buffer
finite_buffer	Executable for finite buffer