

CSCI 360 - Lab 6 Report

Sami Al-Qusus

Oct 23, 2018

Assignment Goals:

- Creating a RAM Space based on a Block RAM

Assignment Instructions (Dr. LoPinto):

- A RAM is a list of byte-addressable locations that can be read and written in any order. A "BlockRAM" is a block addressable memory. The blocks have a fixed size and can be accessed (read or written) as a whole.
- Use the code in the attached tar file as a starting example. You should create a RAM space of a fixed length. Then use a random number generator to fill the space with integers. Once the RAM is filled, sort it using bubble sort. Then verify that the integers are properly sorted.
- You must use only the methods provided by class RamSpace. You must also fill in the methods for BlockRam but those methods are hidden from your main program.

What I did:

1. Went through the example code and made sense of it.
2. I added code so that once the RamSpace is created a for loop fills in the space with random integers.
 - Used `rand() % 100` to generate the integers.
3. I added a bubble sort function to sort the RamSpace.
4. Then to verify that the integers are properly sorted I print them on to the screen.

Note: In `main()`, the RamSpace takes in the size to create the block. But then I did all the sorting and generating of integers in BlockRam because that's what I understood from the instructions.

What I learnt:

- Ram is a list of byte-addressable locations that can be read and written in any order
- I learnt the advantages and disadvantages of Block Ram vs Distributed Ram.
 - From what I understood is that because Block Ram reads and writes as a block its best used when we want to store and read large amounts of data at once. If that's the case its faster than distributed Ram. Otherwise we are better off not using Block Ram because it will take longer and unnecessary space is taken up.

Credits:

- Dr. LoPinto lab6 examples.
- <https://www.quora.com/Which-is-faster-distributed-RAM-or-block-RAM-in-FPGA-1>