

ESE532 Project P1 Report

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1. Our group makeup is Ritika Gupta, Taylor Nelms, and Nishanth Shyamkumar.
2. (a) We end up with $64ns$ to process each $64b$ word of input, which comes out to 76.8 (so, 76) cycles for a 1.2GHz processor.
(b) By similar logic as the last question, with a 200MHz clock, we end up with 12.8 (so, 12) cycles to process all of the input.
3. (a) (i) **Content-Defined Chunking:**

```
skip input to minChunkSize - windowSize
buffer = input[minChunkSize - windowSize : minChunkSize]
curHash = 0
for byte in buffer:
    curHash += hash(byte)
if curHash == 0:
    markChunkBreak()
else:
    while (curHash != 0 and (notAtMaxChunkSize())):
        curHash -= hash(buffer[0])
        moveBufferWindow()
        readNextByte()
        curHash += hash(buffer[windowSize - 1])
    markChunkBreak()
```

(ii) **SHA-256:**

(iii) **Chunk Matching:**

(iv) **LZW Encoding:**

- (b)
- (c)
- (d)
- (e)
4. (a)
- (b)
- (c)
- (d)
- (e)
5. (a)
- (b)
- (c)
- (d)
- (e)
- (f)