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**:

```
if shaResult in chunkDictionary:
    send(shaResult)
else:
    send(LZW(rawChunk))
```

   (iv) **LZW Encoding**:

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