

LZSS IMPLEMENTATION

FINAL PROJRCT

CPE405

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- THIS IS A SIMPLE COMPRESSION TECHNIQUE THAT BASED ON TWO BUFFERS: SEARCH BUFFER AND LOOKAHEAD BUFFER.
- SEARCH BUFFER CONTAIN THE RECENTLY ENCODED SEQUENCE WHILE LOOKAHEAD BUFFER CONTAIN THE NEXT PART TO BE ENCODED.
- THE PROCESS: THERE IS A POINTER THAT GOES BACK IN THE SEARCH BUFFER UNTIL THERE IS A MATCH TO THE SYMBOL IN THE LOOKAHEAD BUFFER.
 - DISTANCE FROM POINTER- OFFSET
 - THE NUMBER OF SYMBOLS MATCHED CALLED THE LENGTH OF THE MATCH.
- SHIFT- ONE TIME EVERY CLOCK CYCLE, OR MORE THAN ONE TIME IN CASE THE LENGTH OF THE MATCH IS LARGER THAN ONE.

ENCODING STEPS

STEP 1-> INITIALIZE THE BUFFERS TO ZERO (SEARCH AND LOOKAHEAD).

STEP 2-> SHIFT CHAR BY CHAR FROM KNOWN STRING UNTIL FILLING LOOKAHEAD BUFFER.

STEP 3->SEARCH FOR THE LONGEST MATCHING STRING IN THE BUFFER.

STEP 4->IF A MATCH IS FOUND, SET ALL THE DATA NEEDED (MATCH, LENGTH AND DISTANCE).

OTHERWISE, SET MATCH TO ZERO (MATCH DID NOT FIND) AND THE FIRST UN-CODED SYMBOL TO THE ENCODED OUTPUT.

STEP 5->SHIFT THE BUFFERS AS THE NUMBER OF MATCHED CHAR FOUND, OTHERWISE, SHIFT ONE TIME.

STEP 6->REPEAT FROM STEP 3, UNTIL ALL THE ENTIRE INPUT HAS BEEN ENCODED.



(0,1) (0,b) (1,1,1) (1,5,3) VSIM 87> run # Match not found: (Match found, Char) # Match found: (Match found, Distance, Length) # (0, i) # (0, 1) # (1, 1, 1) # (1, 3, 1) # (1, 5, 2)

SIMULATION



🔶 /testB/numChar	8	8						
🔶 /testB/dk	1							
💶 🥎 /testB/data_in	6c	6c	79	20	68	<u>, 69</u>	(6c	
/testB/o_match_out	St1							
➡─� /testB/o_distance_out	6				(3		(5	
+	1	0		1		<u>)</u> 0	2	
	i	(i	<u> </u>		(i	<u>(b</u>	(i	
· ∕testB/i	20	8 9	10	11	12	13	14	15
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	6			1	<u>(3</u>		<u> (</u> 5	
Image: approximate the state of the stat	1	0		<u>,1</u>		<u>Xo</u>	2	
	i	<u> </u>	<u> </u>	<u> </u>	χi	<u>(b</u>	χi	
/testB/test/match_out	1							
4.₹0	Now 200 ps	90 p	s 100 ps	110 ps	120 ps	130 ps	140 ps	



- WHAT I LEARNED DURING THE PROJECT?
- HOW CAN I IMPROVE IN THE FUTURE?