Name: Rotha Dapravith

ID: e20190915

Group: I5-GIC(B)

Assignment Discussion Lesson 7

1) Explain LZ77 compression algorithm?

2) By using LZ77 compression algorithm, find encoder and decoder from 2 different examples? You can choose your own string. Note: First block is more than second block!

Answers:

1). LZ77 compression algorithm is used to analyze input data and determine how to reducethe size of that input data by replacing redundant information with metadata. To use itwe need:

1) Set the coding position to the beginning of the input stream (first block and secondblock)
Example: ababbbaaa (first block = 5, second block = 2).
2) Find the longest match in the window for the lookahead buffer.Example:
ababbbaaa.
3) If a match is found, output the pointer. Move the coding position (and the window) nbytes forward.
Example: n = 2.
4) If a match is not found, output a null point and the first byte in the lookahead buffer.Move the coding position (and the window) 1 byte forward.
Example: n = 1.
5) If the lookahead buffer is not empty, return to step 2. Unless finish searching.

2). Find encoder and decoder from 2 examples:

Let **abbbccbbbcbaccdab** be the string.

- We choose first 6 blocks: **abbbcc**
- Next 4 blocks be the second: **bbbc**

Step 1:

➢Compare 4 characters from first block with second block.

a b b b c c b b b c b a c c d a b

- “abbb” ≠ “bbbc” → move 1 character from first block.
- “bbbc” = “bbbc” → match

a b b b c c b b b c b a c c d a b

6 5 4 3 2 1

We get: Codeword<5, 4, C(b)> (n=4)

Step 2: move n+4 (4+1=5) window at first block

➢Keep taking 6 characters from first block and 4 characters from second block.

a b b b c c b b b c b a c c d a b

➢Compare 4 characters from first block with second block.

c c b b b c b a c c d a b

- “ccbb” ≠ “bacc” → move 1 character from first block.
- “cbbb” ≠ “bacc” → move 1 character from first block.
- “bbbc” ≠ “bacc” → move 1 character from first block.
- “So, remove 1 character at the end from second block.
- It rests 3 characters from second block: “dacc”.

➢Compare 3 characters from first block with second block.

c c b b b c b a c c d a b

- “ccb” ≠ “bac” → move 1 character from first block.
- “cbb” ≠ “bac” → move 1 character from first block.
- “bbb” ≠ “bac” → move 1 character from first block
- “bbc” ≠ “bac” → move 1 character from first block
- So, remove 1 character at the end from second block.
- It rests 2 characters from second block: “ba”.

➢ Compare 2 characters from first block with second block.

c c b b b c b a c c d a b

- “cc” ≠ “ba” → move 1 character from first block.
- “cb” ≠ “ba” → move 1 character from first block.
- “bb” = “ba” → move 1 character from first block.