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Assignment Lesson09

1) Find encoder and decoder of LZW? If we have:

Input string: “abdcaedbdcecabb”

2) Find encoder and decoder of LZW? If we have:

Input string: “cdaabbefacbdegfeeggf”

**Answers**

1. Find encoder and decoder of LZW: input string: “abdcaedbdcecabb”

* Encoder:

Base Dictionary

|  |  |
| --- | --- |
| Entry | Codeword |
| a | 1 |
| b | 2 |
| c | 3 |
| d | 4 |
| e | 5 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| s | c | Item | Codeword | Output |
| a | b | ab | 6 | 1 |
| b | d | bd | 7 | 2 |
| d | c | dc | 8 | 4 |
| c | a | ca | 9 | 3 |
| a | e | ae | 10 | 1 |
| e | d | ed | 11 | 5 |
| d | b | db | 12 | 4 |
| b | d |  |  |  |
| bd | c | bdc | 13 | 7 |
| c | e | ce | 14 | 3 |
| e | c | ec | 15 | 5 |
| c | a |  |  |  |
| ca | b | cab | 16 | 9 |
| b | b | bb | 17 | 2 |
| b | EOF |  |  | 2 |

**Thus:** Encoder: {1 2 4 3 1 5 4 7 3 5 9 2 2 EOF}

* Decoder: string = {1 2 4 3 1 5 4 7 3 5 9 2 2 EOF}

Base Dictionary

|  |  |
| --- | --- |
| Entry | Codeword |
| a | 1 |
| b | 2 |
| c | 3 |
| d | 4 |
| e | 5 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| s | k | Item | Codeword | Output |
| null | 1 |  |  | a |
| a | 2 | ab | 6 | b |
| b | 4 | bd | 7 | d |
| d | 3 | dc | 8 | c |
| c | 1 | ca | 9 | a |
| a | 5 | ae | 10 | e |
| e | 4 | ed | 11 | d |
| d | 7 | db | 12 | bd |
| bd | 3 | bdc | 13 | c |
| c | 5 | ce | 14 | e |
| e | 9 | ec | 15 | ca |
| ca | 2 | cab | 16 | b |
| b | 2 | bb | 17 | b |
| b | EOF |  |  |  |

**Thus:** Decoder: abdcaedbdcecabb

Find encoder and decoder of LZW: input string: “cdaabbefacbdegfeeggf”

* Encoder:

Base Dictionary

|  |  |
| --- | --- |
| Entry | Codeword |
| a | 1 |
| b | 2 |
| c | 3 |
| d | 4 |
| e | 5 |
| f | 6 |
| g | 7 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| s | c | Item | Codeword | Output |
| c | d | cd | 8 | 3 |
| d | a | da | 9 | 4 |
| a | a | aa | 10 | 1 |
| a | b | ab | 11 | 1 |
| b | b | bb | 12 | 2 |
| b | e | be | 13 | 2 |
| e | f | ef | 14 | 5 |
| f | a | fa | 15 | 6 |
| a | c | ac | 16 | 1 |
| c | b | cb | 17 | 3 |
| b | d | bd | 18 | 2 |
| d | e | de | 19 | 4 |
| e | g | eg | 20 | 5 |
| g | f | gf | 21 | 7 |
| f | e | fe | 22 | 6 |
| e | e | ee | 23 | 5 |
| e | g |  |  |  |
| eg | g | egg | 24 | 20 |
| g | f |  |  |  |
| gf | EOF |  |  | 21 |

**Thus:** Encoder: {3 4 1 1 2 2 5 6 1 3 2 4 5 7 6 5 20 21}

* Decoder: string = {3 4 1 1 2 2 5 6 1 3 2 4 5 7 6 5 20 21 EOF}

Base Dictionary

|  |  |
| --- | --- |
| Entry | Codeword |
| a | 1 |
| b | 2 |
| c | 3 |
| d | 4 |
| e | 5 |
| f | 6 |
| g | 7 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| s | k | Item | Codeword | Output |
| null | 3 |  |  | c |
| c | 4 | cd | 8 | d |
| d | 1 | da | 9 | a |
| a | 1 | aa | 10 | a |
| a | 2 | ab | 11 | b |
| b | 2 | bb | 12 | b |
| b | 5 | be | 13 | e |
| e | 6 | ef | 14 | f |
| f | 1 | fa | 15 | a |
| a | 3 | ac | 16 | c |
| c | 2 | cb | 17 | b |
| b | 4 | bd | 18 | d |
| d | 5 | de | 19 | e |
| e | 7 | eg | 20 | g |
| g | 6 | gf | 21 | f |
| f | 5 | fe | 22 | e |
| e | 20 | ee | 23 | eg |
| g | 21 | gg | 24 | gf |
| f | EOF |  |  |  |

**Thus:** Decoder: cdaabbefacbdegfeeggf