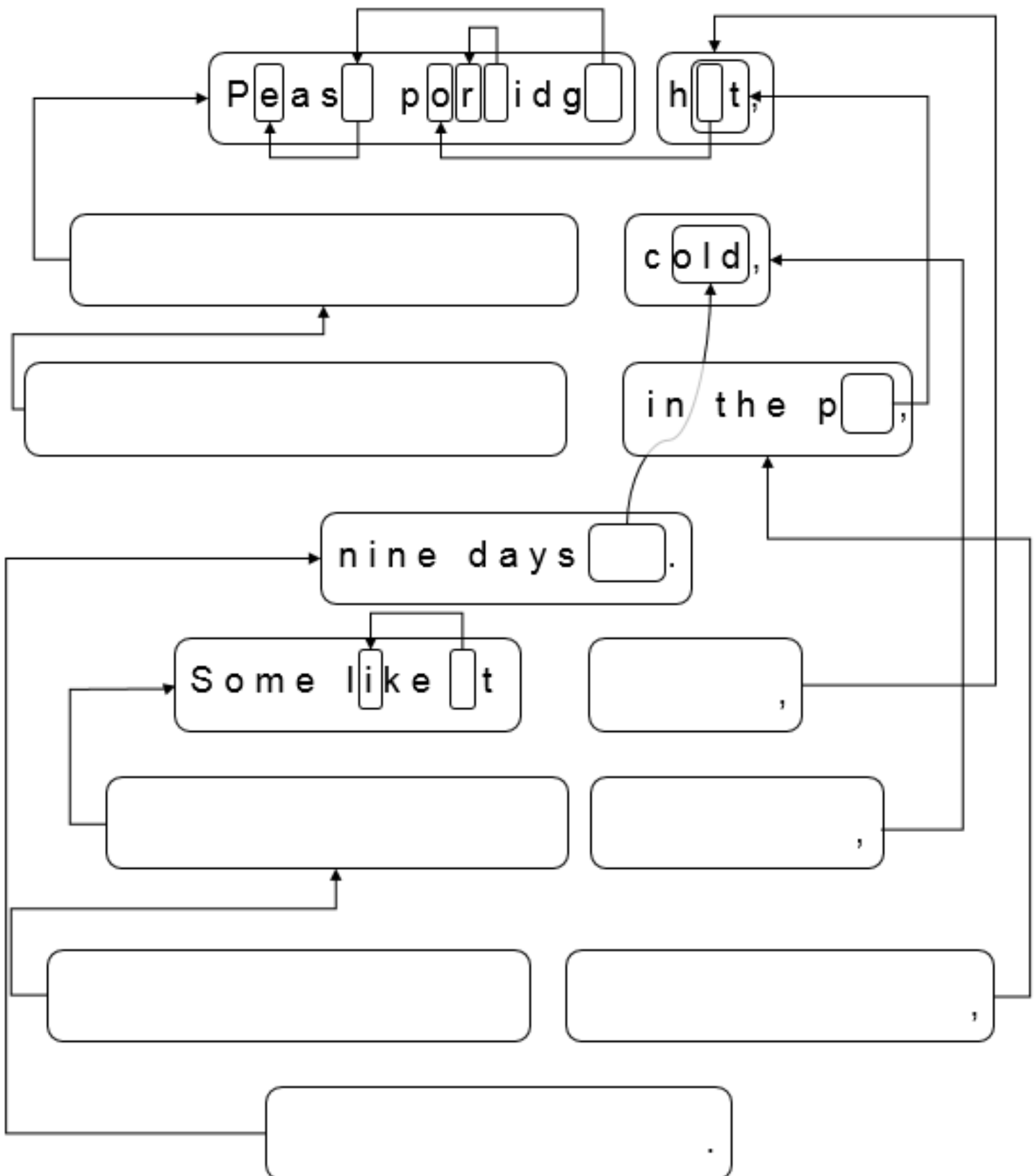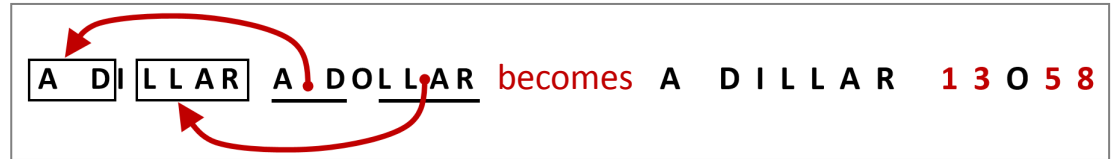# Exercise 1: Message Decompression

Start at the word beginning 'Peas' and complete the phrase. Fill in each blank box by following the arrow attached to it and copying the character (or string of characters) in the box it points to.

Peas por idg h t,

cold,

in the p ,

nine days .

Some like t

Exercise 2: Message Decompression

The underscores represent a position of each character, starting at 01. The compressed message is on the top line. The two numbers in the brackets points back to a repeated text string. The first number is the starting position of the string. The second number is the length (in characters). Armed with this information, can you decompress the message below. Use the lower box to work out your answer.

```
How_much_wood_could_a(9,15)hopper(27,31)_if(20,36)(16,18)(26,31)(9,13)
```

01	06	11	16	21	26	31	36

```
How_much_wood_____
```

41	46	51	56	61	66	71

Exercise 3: Compressing A Message

A DILLAR ADOLLAR becomes A DILLAR 1 3 O 5 8

Use the top box below to work out where text strings repeat.

Scan through the text, looking for a repeating section. When you find one, underline it, put a box around the original section, and then draw a line between the two. Do **not** encode any fragment that is **less than 3 characters long**.

Use the bottom box to write out your compressed text. Scan through the text in the top box, character by character. Every time you find a character that is **not** underlined, simply copy it into the first free space in the bottom box. When you find an underlined (ie repeated) section, write two numbers down in the next two free positions in the bottom box – the starting position of the original text and the position of the last character to be copied.

```
01          06          11          16          21          26          31          36          41          46

 P E T E R    P I P E R    P I C K E D    A    P E C K    O F    P I C K L E D    P E P P E R S .


47        51          56          61          66          71          76          81          86          91

 A    P E C K    O F    P I C K L E D    P E P P E R S    P E T E R    P I P E R    P I C K E D .
```

Compressed Text: Important - a number with more than one digit only takes up one space in the bottom box.

```
01          06          11          16          21          26          31          36          41          46

_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _


47        51          56          61          66          71          76          81          86          91

_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
```

When you have finished, fill in the box (right) with the number of spaces the message now takes up. Can you work out the size of the new file as a percentage of the original?

Total: