

## CA446 Statistical Machine Translation

### Tutorial Exercises, 27<sup>th</sup> March 2014

(a) List all phrase pairs that are consistent with the following word alignment:

	<i>A</i>	<i>B</i>	<i>C</i>
<i>X</i>	■	□	□
<i>Y</i>	□	■	□
<i>Z</i>	□	□	■

(b) List all phrase pairs that are consistent with the following word alignment:

	<i>A</i>	<i>B</i>	<i>C</i>
<i>X</i>	■	□	□
<i>Y</i>	□	□	□
<i>Z</i>	□	□	■

(c) Given the following sentence alignments:

*The book*                      *blue book*

*An leabhar*                    *leabhar gorm*

State what the following translation probabilities will be after *two* iterations of the Expectation Maximisation algorithm and show all the steps you followed to arrive at these values:

- i.  $t(\textit{leabhar}/\textit{The})$
- ii.  $t(\textit{An}/\textit{The})$
- iii.  $t(\textit{gorm}/\textit{The})$
- iv.  $t(\textit{leabhar}/\textit{book})$
- v.  $t(\textit{An}/\textit{book})$
- vi.  $t(\textit{gorm}/\textit{book})$
- vii.  $t(\textit{leabhar}/\textit{blue})$
- viii.  $t(\textit{An}/\textit{blue})$
- ix.  $t(\textit{gorm}/\textit{blue})$

