

| tag | accuracy | f1 score | accuracy for unknown words | accuracy for known words | number of unknown words | number of known words |
|----------------------------------|----------|----------|----------------------------------|--------------------------------|-------------------------------|-----------------------------|
| A (إسم) | 94.78 % | 62.28 % | 94.74 % | 94.79 % | 19 | 211 |
| B (رقم) | 99.47 % | 49.87 % | 100.0 % | 99.45 % | 5 | 182 |
| C (إسم معرف) | 93.33 % | 92.25 % | 60.0 % | 97.04 % | 15 | 135 |
| D (إضافة) | 87.25 % | 86.54 % | 53.85 % | 90.44 % | 13 | 136 |
| E (منعوت) | 90.71 % | 88.36 % | 37.5 % | 93.94 % | 8 | 132 |
| F (نعت) | 68.26 % | 47.29 % | 50.0 % | 69.93 % | 14 | 153 |
| G (حرف جر) | 100.0 % | 100.0 % | 100.0 % | 100.0 % | 2 | 27 |
| H (إسم مجرور) | 71.43 % | 49.44 % | 66.67 % | 72.0 % | 3 | 25 |
| I (وحدة قياس) | 98.04 % | 49.5 % | 100.0 % | 98.0 % | 2 | 100 |
| J (واو العطف) | 100.0 % | 100.0 % | NULL | 100.0 % | 0 | 18 |
| K (فعل مبني للمجهول) | 81.25 % | 29.89 % | 100.0 % | 78.57 % | 2 | 14 |
| L (المفعول المطلق) | 0.0 % | 0.0 % | NULL | 0.0 % | 0 | 1 |
| M (أداة عطف غير واو العطف) | 100.0 % | 100.0 % | NULL | 100.0 % | 0 | 8 |
| . | 99.87 % | 49.97 % | NULL | 99.87 % | 0 | 787 |

Table 1: Performances for each tag using a second order HMM for fold 3

| tag | accuracy | f1 score | accuracy for unknown words | accuracy for known words | number of unknown words | unknown words percentage |
|-----|----------|----------|----------------------------------|--------------------------------|-------------------------------|--------------------------------|
| 0 | 93.72 % | 64.13 % | 70.0 % | 94.81 % | 78 | 9.67 % |
| 1 | 92.48 % | 62.96 % | 64.75 % | 94.14 % | 107 | 13.26 % |
| 2 | 94.04 % | 65.53 % | 70.87 % | 95.29 % | 88 | 10.9 % |
| 3 | 93.89 % | 86.87 % | 68.67 % | 94.97 % | 75 | 9.29 % |
| 4 | - | - | - | - | - | - |
| 5 | - | - | - | - | - | - |
| 6 | - | - | - | - | - | - |
| 7 | - | - | - | - | - | - |
| 8 | - | - | - | - | - | - |
| 9 | - | - | - | - | - | - |
| Avg | - | - | - | - | - | - |

Table 2: Performances using a second order HMM for fold 3