

| tag | accuracy | f1 score | accuracy for unknown words | accuracy for known words | number of unknown words | number of known words |
|----------------------------------|----------|----------|----------------------------------|--------------------------------|-------------------------------|-----------------------------|
| A (إسم) | 93.69 % | 61.05 % | 72.73 % | 94.79 % | 11 | 211 |
| B (رقم) | 100.0 % | 100.0 % | 100.0 % | 100.0 % | 6 | 205 |
| C (إسم معرف) | 90.45 % | 60.41 % | 73.33 % | 92.25 % | 15 | 142 |
| D (إضافة) | 85.35 % | 62.58 % | 85.71 % | 85.31 % | 14 | 143 |
| E (منعوت) | 95.89 % | 95.06 % | 40.0 % | 97.87 % | 5 | 141 |
| F (نعت) | 68.26 % | 47.36 % | 27.78 % | 73.15 % | 18 | 149 |
| G (حرف جر) | 100.0 % | 100.0 % | NULL | 100.0 % | 0 | 47 |
| H (إسم مجرور) | 66.67 % | 66.56 % | 50.0 % | 77.27 % | 14 | 22 |
| I (وحدة قياس) | 100.0 % | 100.0 % | 100.0 % | 100.0 % | 3 | 114 |
| J (واو العطف) | 97.67 % | 49.41 % | NULL | 97.67 % | 0 | 43 |
| K (فعل مبني للمجهول) | 75.0 % | 39.44 % | 66.67 % | 76.19 % | 3 | 21 |
| 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 | 10 |
| . | 100.0 % | 100.0 % | NULL | 100.0 % | 0 | 784 |

Table 1: Performances for each tag using a second order HMM for fold 5

| 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 | 92.53 % | 63.0 % | 64.75 % | 94.19 % | 107 | 13.26 % |
| 2 | 94.14 % | 65.6 % | 70.87 % | 95.39 % | 88 | 10.9 % |
| 3 | 93.94 % | 86.92 % | 68.67 % | 95.02 % | 75 | 9.29 % |
| 4 | 93.42 % | 86.61 % | 66.02 % | 94.81 % | 92 | 11.4 % |
| 5 | 93.83 % | 65.85 % | 62.92 % | 95.18 % | 83 | 10.29 % |
| 6 | - | - | - | - | - | - |
| 7 | - | - | - | - | - | - |
| 8 | - | - | - | - | - | - |
| 9 | - | - | - | - | - | - |
| Avg | - | - | - | - | - | - |

Table 2: Performances using a second order HMM for fold 5