

**taxisearch.py:** Computes shortest distance between known taxi locations in nyc.

**beam\_search.py:** Uses beam search NMT to translate french into english.

### **Uniform Cost Search**

Input: 3, 14973

Output:

Path found with distance 6.95 in time 4.320441246032715

Path: [3, 2, 14973]

### **A\* search**

Input: 3, 14973

Output: (distance includes heuristic)

Path found with distance 13.5473339295591 in time 4.819656133651733

Path: [3, 2, 14973]

### **BLEU first score**

sacreBLEU: That's 100 lines that end in a tokenized period ('.')

sacreBLEU: It looks like you forgot to detokenize your test data, which may hurt your score.

sacreBLEU: If you insist your data is detokenized, or don't care, you can suppress this message with the `force` parameter.

```
{
  "name": "BLEU",
  "score": 12.5,
  "signature": "nrefs:1|case:mixed|eff:no|tok:13a|smooth:exp|version:2.0.0",
  "verbose_score": "41.1/13.4/7.9/5.7 (BP = 1.000 ratio = 1.036 hyp_len = 6440 ref_len = 6218)",
  "nrefs": "1",
  "case": "mixed",
  "eff": "no",
  "tok": "13a",
  "smooth": "exp",
  "version": "2.0.0"
}
```

### **BLEU k 2-20 scores**

#### **k=2**

sacreBLEU: That's 100 lines that end in a tokenized period ('.')

sacreBLEU: It looks like you forgot to detokenize your test data, which may hurt your score.

sacreBLEU: If you insist your data is detokenized, or don't care, you can suppress this message with the `force` parameter.

```
{
  "name": "BLEU",
  "score": 9.6,
  "signature": "nrefs:1|case:mixed|eff:no|tok:13a|smooth:exp|version:2.0.0",
  "verbose_score": "41.3/11.6/5.6/3.2 (BP = 1.000 ratio = 1.016 hyp_len = 6315 ref_len = 6218)",
  "nrefs": "1",
  "case": "mixed",

```

```
"eff": "no",
"tok": "13a",
"smooth": "exp",
"version": "2.0.0"
}
```

### **k=3**

sacreBLEU: That's 100 lines that end in a tokenized period ('.')

sacreBLEU: It looks like you forgot to detokenize your test data, which may hurt your score.

sacreBLEU: If you insist your data is detokenized, or don't care, you can suppress this message with the `force` parameter.

```
{
  "name": "BLEU",
  "score": 8.7,
  "signature": "nrefs:1|case:mixed|eff:no|tok:13a|smooth:exp|version:2.0.0",
  "verbose_score": "40.9/10.6/5.0/2.6 (BP = 1.000 ratio = 1.007 hyp_len = 6262 ref_len = 6218)",
  "nrefs": "1",
  "case": "mixed",
  "eff": "no",
  "tok": "13a",
  "smooth": "exp",
  "version": "2.0.0"
}
```

### **k=4**

sacreBLEU: That's 100 lines that end in a tokenized period ('.')

sacreBLEU: It looks like you forgot to detokenize your test data, which may hurt your score.

sacreBLEU: If you insist your data is detokenized, or don't care, you can suppress this message with the `force` parameter.

```
{
  "name": "BLEU",
  "score": 8.3,
  "signature": "nrefs:1|case:mixed|eff:no|tok:13a|smooth:exp|version:2.0.0",
  "verbose_score": "40.4/10.5/4.7/2.4 (BP = 1.000 ratio = 1.014 hyp_len = 6307 ref_len = 6218)",
  "nrefs": "1",
  "case": "mixed",
  "eff": "no",
  "tok": "13a",
  "smooth": "exp",
  "version": "2.0.0"
}
```

### **k=5**

sacreBLEU: That's 100 lines that end in a tokenized period ('.')

sacreBLEU: It looks like you forgot to detokenize your test data, which may hurt your score.

sacreBLEU: If you insist your data is detokenized, or don't care, you can suppress this message with the `force` parameter.

```
{
  "name": "BLEU",
```

```

"score": 7.1,
"signature": "nrefs:1|case:mixed|eff:no|tok:13a|smooth:exp|version:2.0.0",
"verbose_score": "40.3/9.8/4.0/1.6 (BP = 1.000 ratio = 1.006 hyp_len = 6256 ref_len = 6218)",
"nrefs": "1",
"case": "mixed",
"eff": "no",
"tok": "13a",
"smooth": "exp",
"version": "2.0.0"
}

```

#### **k=6**

sacreBLEU: That's 100 lines that end in a tokenized period ('.')

sacreBLEU: It looks like you forgot to detokenize your test data, which may hurt your score.

sacreBLEU: If you insist your data is detokenized, or don't care, you can suppress this message with the `force` parameter.

```

{
  "name": "BLEU",
  "score": 7.4,
  "signature": "nrefs:1|case:mixed|eff:no|tok:13a|smooth:exp|version:2.0.0",
  "verbose_score": "40.1/9.7/4.1/1.8 (BP = 1.000 ratio = 1.016 hyp_len = 6255 ref_len = 6218)",
  "nrefs": "1",
  "case": "mixed",
  "eff": "no",
  "tok": "13a",
  "smooth": "exp",
  "version": "2.0.0"
}

```

#### **k=7**

sacreBLEU: That's 100 lines that end in a tokenized period ('.')

sacreBLEU: It looks like you forgot to detokenize your test data, which may hurt your score.

sacreBLEU: If you insist your data is detokenized, or don't care, you can suppress this message with the `force` parameter.

```

{
  "name": "BLEU",
  "score": 7.3,
  "signature": "nrefs:1|case:mixed|eff:no|tok:13a|smooth:exp|version:2.0.0",
  "verbose_score": "40.2/9.9/4.0/1.7 (BP = 1.000 ratio = 1.008 hyp_len = 6252 ref_len = 6218)",
  "nrefs": "1",
  "case": "mixed",
  "eff": "no",
  "tok": "13a",
  "smooth": "exp",
  "version": "2.0.0"
}

```

#### **k=8**

sacreBLEU: That's 100 lines that end in a tokenized period ('.')

sacreBLEU: It looks like you forgot to detokenize your test data, which may hurt your score.

sacreBLEU: If you insist your data is detokenized, or don't care, you can suppress this message with the `force` parameter.

```
{
  "name": "BLEU",
  "score": 7.3,
  "signature": "nrefs:1|case:mixed|eff:no|tok:13a|smooth:exp|version:2.0.0",
  "verbose_score": "40.3/9.8/4.0/1.6 (BP = 1.000 ratio = 1.006 hyp_len = 6256 ref_len = 6218)",
  "nrefs": "1",
  "case": "mixed",
  "eff": "no",
  "tok": "13a",
  "smooth": "exp",
  "version": "2.0.0"
}
```

**k=9**

sacreBLEU: That's 100 lines that end in a tokenized period ('.')

sacreBLEU: It looks like you forgot to detokenize your test data, which may hurt your score.

sacreBLEU: If you insist your data is detokenized, or don't care, you can suppress this message with the `force` parameter.

```
{
  "name": "BLEU",
  "score": 7.4,
  "signature": "nrefs:1|case:mixed|eff:no|tok:13a|smooth:exp|version:2.0.0",
  "verbose_score": "40.4/10.5/4.7/2.4 (BP = 1.000 ratio = 1.014 hyp_len = 6307 ref_len = 6218)",
  "nrefs": "1",
  "case": "mixed",
  "eff": "no",
  "tok": "13a",
  "smooth": "exp",
  "version": "2.0.0"
}
```

**k=10**

sacreBLEU: That's 100 lines that end in a tokenized period ('.')

sacreBLEU: It looks like you forgot to detokenize your test data, which may hurt your score.

sacreBLEU: If you insist your data is detokenized, or don't care, you can suppress this message with the `force` parameter.

```
{
  "name": "BLEU",
  "score": 7.5,
  "signature": "nrefs:1|case:mixed|eff:no|tok:13a|smooth:exp|version:2.0.0",
  "verbose_score": "39.4/9.5/4.2/2.0 (BP = 1.000 ratio = 1.022 hyp_len = 6353 ref_len = 6218)",
  "nrefs": "1",
  "case": "mixed",

```

```
"eff": "no",  
"tok": "13a",  
"smooth": "exp",  
"version": "2.0.0"
```

```
}
```

#### **k=11**

sacreBLEU: That's 100 lines that end in a tokenized period ('.')

sacreBLEU: It looks like you forgot to detokenize your test data, which may hurt your score.

sacreBLEU: If you insist your data is detokenized, or don't care, you can suppress this message with the `force` parameter.

```
{
```

```
  "name": "BLEU",  
  "score": 7.6,  
  "signature": "nrefs:1|case:mixed|eff:no|tok:13a|smooth:exp|version:2.0.0",  
  "verbose_score": "39.3/9.7/4.1/2.1 (BP = 1.000 ratio = 1.020 hyp_len = 6353 ref_len =  
6218)",  
  "nrefs": "1",  
  "case": "mixed",  
  "eff": "no",  
  "tok": "13a",  
  "smooth": "exp",  
  "version": "2.0.0"
```

```
}
```

#### **k=12**

sacreBLEU: That's 100 lines that end in a tokenized period ('.')

sacreBLEU: It looks like you forgot to detokenize your test data, which may hurt your score.

sacreBLEU: If you insist your data is detokenized, or don't care, you can suppress this message with the `force` parameter.

```
{
```

```
  "name": "BLEU",  
  "score": 7.5,  
  "signature": "nrefs:1|case:mixed|eff:no|tok:13a|smooth:exp|version:2.0.0",  
  "verbose_score": "39.3/9.4/4.1/2.0 (BP = 1.000 ratio = 1.022 hyp_len = 6353 ref_len =  
6218)",  
  "nrefs": "1",  
  "case": "mixed",  
  "eff": "no",  
  "tok": "13a",  
  "smooth": "exp",  
  "version": "2.0.0"
```

```
}
```

#### **k=13**

sacreBLEU: That's 100 lines that end in a tokenized period ('.')

sacreBLEU: It looks like you forgot to detokenize your test data, which may hurt your score.

sacreBLEU: If you insist your data is detokenized, or don't care, you can suppress this message with the `force` parameter.

```
{
```

```
  "name": "BLEU",
```

```

"score": 7.4,
"signature": "nrefs:1|case:mixed|eff:no|tok:13a|smooth:exp|version:2.0.0",
"verbose_score": "39.4/9.5/4.2/2.0 (BP = 1.000 ratio = 1.023 hyp_len = 6356 ref_len = 6218)",
"nrefs": "1",
"case": "mixed",
"eff": "no",
"tok": "13a",
"smooth": "exp",
"version": "2.0.0"
}

```

#### **k=14**

sacreBLEU: That's 100 lines that end in a tokenized period ('.')

sacreBLEU: It looks like you forgot to detokenize your test data, which may hurt your score.

sacreBLEU: If you insist your data is detokenized, or don't care, you can suppress this message with the `force` parameter.

```

{
  "name": "BLEU",
  "score": 7.2,
  "signature": "nrefs:1|case:mixed|eff:no|tok:13a|smooth:exp|version:2.0.0",
  "verbose_score": "39.2/9.7/4.0/2.3 (BP = 1.000 ratio = 1.025 hyp_len = 6350 ref_len = 6218)",
  "nrefs": "1",
  "case": "mixed",
  "eff": "no",
  "tok": "13a",
  "smooth": "exp",
  "version": "2.0.0"
}

```

#### **k=15**

sacreBLEU: That's 100 lines that end in a tokenized period ('.')

sacreBLEU: It looks like you forgot to detokenize your test data, which may hurt your score.

sacreBLEU: If you insist your data is detokenized, or don't care, you can suppress this message with the `force` parameter.

```

{
  "name": "BLEU",
  "score": 7.6,
  "signature": "nrefs:1|case:mixed|eff:no|tok:13a|smooth:exp|version:2.0.0",
  "verbose_score": "39.6/9.3/4.1/2.2 (BP = 1.000 ratio = 1.024 hyp_len = 6355 ref_len = 6218)",
  "nrefs": "1",
  "case": "mixed",
  "eff": "no",
  "tok": "13a",
  "smooth": "exp",
  "version": "2.0.0"
}

```

**k=16**

sacreBLEU: That's 100 lines that end in a tokenized period ('.')

sacreBLEU: It looks like you forgot to detokenize your test data, which may hurt your score.

sacreBLEU: If you insist your data is detokenized, or don't care, you can suppress this message with the `force` parameter.

```
{
  "name": "BLEU",
  "score": 7.5,
  "signature": "nrefs:1|case:mixed|eff:no|tok:13a|smooth:exp|version:2.0.0",
  "verbose_score": "39.4/9.5/4.2/2.0 (BP = 1.000 ratio = 1.022 hyp_len = 6353 ref_len = 6218)",
  "nrefs": "1",
  "case": "mixed",
  "eff": "no",
  "tok": "13a",
  "smooth": "exp",
  "version": "2.0.0"
}
```

**k=17**

sacreBLEU: That's 100 lines that end in a tokenized period ('.')

sacreBLEU: It looks like you forgot to detokenize your test data, which may hurt your score.

sacreBLEU: If you insist your data is detokenized, or don't care, you can suppress this message with the `force` parameter.

```
{
  "name": "BLEU",
  "score": 7.3,
  "signature": "nrefs:1|case:mixed|eff:no|tok:13a|smooth:exp|version:2.0.0",
  "verbose_score": "39.2/9.6/4.1/2.1 (BP = 1.000 ratio = 1.019 hyp_len = 6351 ref_len = 6218)",
  "nrefs": "1",
  "case": "mixed",
  "eff": "no",
  "tok": "13a",
  "smooth": "exp",
  "version": "2.0.0"
}
```

**k=18**

sacreBLEU: That's 100 lines that end in a tokenized period ('.')

sacreBLEU: It looks like you forgot to detokenize your test data, which may hurt your score.

sacreBLEU: If you insist your data is detokenized, or don't care, you can suppress this message with the `force` parameter.

```
{
  "name": "BLEU",
  "score": 7.4,
  "signature": "nrefs:1|case:mixed|eff:no|tok:13a|smooth:exp|version:2.0.0",
  "verbose_score": "40.1/9.7/4.1/1.8 (BP = 1.000 ratio = 1.016 hyp_len = 6255 ref_len = 6218)",
}
```

```
"nrefs": "1",
"case": "mixed",
"eff": "no",
"tok": "13a",
"smooth": "exp",
"version": "2.0.0"
}
```

#### **k=19**

sacreBLEU: That's 100 lines that end in a tokenized period ('.')

sacreBLEU: It looks like you forgot to detokenize your test data, which may hurt your score.

sacreBLEU: If you insist your data is detokenized, or don't care, you can suppress this message with the `force` parameter.

```
{
  "name": "BLEU",
  "score": 7.3,
  "signature": "nrefs:1|case:mixed|eff:no|tok:13a|smooth:exp|version:2.0.0",
  "verbose_score": "39.5/9.3/4.1/1.9 (BP = 1.000 ratio = 1.020 hyp_len = 6346 ref_len = 6218)",
  "nrefs": "1",
  "case": "mixed",
  "eff": "no",
  "tok": "13a",
  "smooth": "exp",
  "version": "2.0.0"
}
```

#### **k=20**

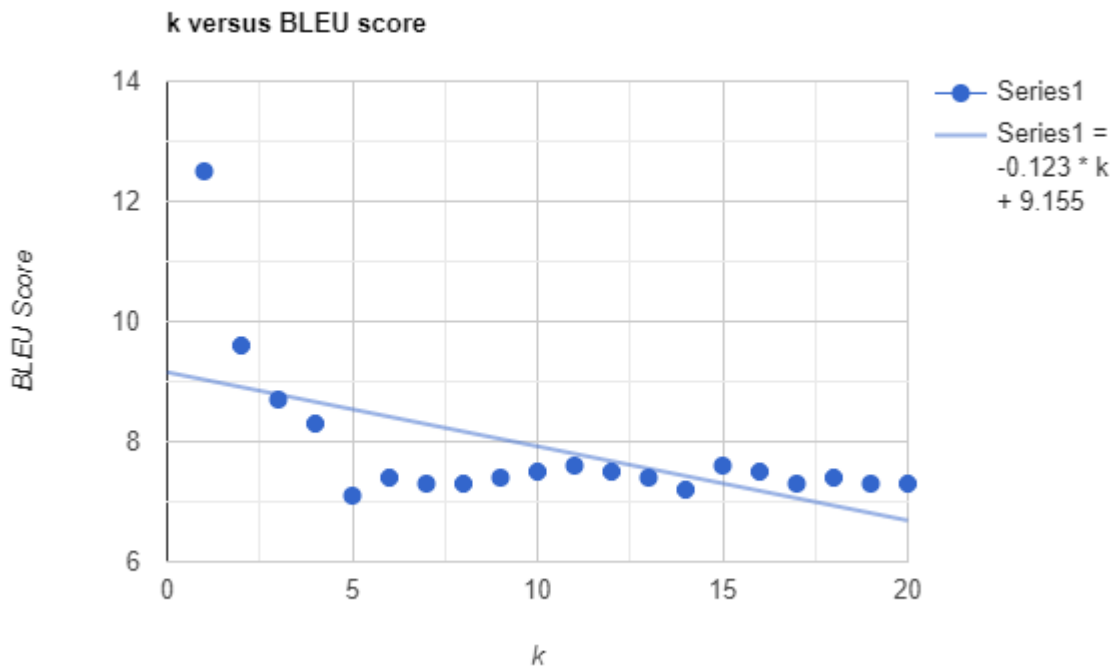
sacreBLEU: That's 100 lines that end in a tokenized period ('.')

sacreBLEU: It looks like you forgot to detokenize your test data, which may hurt your score.

sacreBLEU: If you insist your data is detokenized, or don't care, you can suppress this message with the `force` parameter.

```
{
  "name": "BLEU",
  "score": 7.3,
  "signature": "nrefs:1|case:mixed|eff:no|tok:13a|smooth:exp|version:2.0.0",
  "verbose_score": "39.4/9.4/4.0/1.8 (BP = 1.000 ratio = 1.020 hyp_len = 6344 ref_len = 6218)",
  "nrefs": "1",
  "case": "mixed",
  "eff": "no",
  "tok": "13a",
  "smooth": "exp",
  "version": "2.0.0"
}
```





### Best Score (k=1):

sacreBLEU: That's 100 lines that end in a tokenized period ('.')

sacreBLEU: It looks like you forgot to detokenize your test data, which may hurt your score.

sacreBLEU: If you insist your data is detokenized, or don't care, you can suppress this message with the `force` parameter.

```
{
  "name": "BLEU",
  "score": 12.5,
  "signature": "nrefs:1|case:mixed|eff:no|tok:13a|smooth:exp|version:2.0.0",
  "verbose_score": "41.1/13.4/7.9/5.7 (BP = 1.000 ratio = 1.036 hyp_len = 6440 ref_len = 6218)",
  "nrefs": "1",
  "case": "mixed",
  "eff": "no",
  "tok": "13a",
  "smooth": "exp",
  "version": "2.0.0"
}
```