

Problem2

April 7, 2021

1 Problem 2: Tensorflow Metropolis

https://www.tensorflow.org/probability/api_docs/python/tfp/mcmc/RandomWalkMetropolis

```
[8]: import sys
import os
```

```
[10]: import numpy as np
import tensorflow as tf
import tensorflow_probability as tfp
```

```
-----
ModuleNotFoundError                                Traceback (most recent call last)
<ipython-input-10-c8caa19687a0> in <module>
      1 import numpy as np
      2 import tensorflow as tf
----> 3 import tensorflow_probability as tfp

ModuleNotFoundError: No module named 'tensorflow_probability'
```

```
[11]: tfd = tfp.distributions
```

```
-----
NameError                                           Traceback (most recent call last)
<ipython-input-11-dc1e2415bf91> in <module>
----> 1 tfd = tfp.distributions

NameError: name 'tfp' is not defined
```

```
[12]: dtype = np.float32
```

```
[13]: target = tfd.Normal(loc=dtype(0), scale=dtype(1))
```

```
-----
NameError                                           Traceback (most recent call last)
<ipython-input-13-5c7483e977c6> in <module>
```

```
----> 1 target = tfd.Normal(loc=dtype(0), scale=dtype(1))
```

NameError: name 'tfd' is not defined

```
[14]: samples = tfp.mcmc.sample_chain(  
    num_results=1000,  
    current_state=dtype(1),  
    kernel=tfp.mcmc.RandomWalkMetropolis(target.log_prob),  
    num_burnin_steps=500,  
    trace_fn=None,  
    seed=42)
```

NameError Traceback (most recent call last)

<ipython-input-14-35c2c89c738d> in <module>

```
----> 1 samples = tfp.mcmc.sample_chain(  
      2     num_results=1000,  
      3     current_state=dtype(1),  
      4     kernel=tfp.mcmc.RandomWalkMetropolis(target.log_prob),  
      5     num_burnin_steps=500,
```

NameError: name 'tfp' is not defined

```
[15]: sample_mean = tf.math.reduce_mean(samples, axis=0)  
sample_std = tf.sqrt(  
    tf.math.reduce_mean(  
        tf.math.squared_difference(samples, sample_mean),  
        axis=0))
```

NameError Traceback (most recent call last)

<ipython-input-15-4fbddd6e2d67> in <module>

```
----> 1 sample_mean = tf.math.reduce_mean(samples, axis=0)  
      2 sample_std = tf.sqrt(  
      3     tf.math.reduce_mean(  
      4         tf.math.squared_difference(samples, sample_mean),  
      5         axis=0))
```

NameError: name 'samples' is not defined

```
[17]: print('Estimated mean: {}'.format(sample_mean))  
print('Estimated standard deviation: {}'.format(sample_std))
```

NameError Traceback (most recent call last)

```
<ipython-input-17-c3fb573babe5> in <module>
----> 1 print('Estimated mean: {}'.format(sample_mean))
      2 print('Estimated standard deviation: {}'.format(sample_std))
```

```
NameError: name 'sample_mean' is not defined
```

```
[ ]:
```