Untitled2

March 31, 2025

[1]:
```
import numpy as np
import matplotlib.pyplot as mp


from numpy.random import default_rng
rng = default_rng()
```

[5]:
```
def pick_random_points(a,b,N):
    return a+ (b-a)*rng.random(N)
```

[7]:
```
pick_random_points(3,5,10)
```

[7]:
```
array([4.78820262, 3.531991  , 4.07732156, 4.91540452, 3.60289289,
       4.32172808, 4.39221687, 4.3360251 , 4.36542558, 4.25747356])
```

[11]:
```
list(zip(range(5),range(1,6)))
```

[11]:
```
[(0, 1), (1, 2), (2, 3), (3, 4), (4, 5)]
```

[16]:
```
def method1(f,a,b,mu,N):
    xs = pick_random_points(a,b,N)
    ys = pick_random_points(0,mu,N)

    below = list(filter(lambda z: z[1]<= f(z[0]) ,list(zip(xs,ys))))
    return (b-a)*mu*len(below)/N
```

[14]:
```
def g(x):
    return x
```

[20]:
```
method1(g,0,1,20,100000)
```

[20]:
```
0.5036
```

[21]:
```
def method2(f,a,b,N):
    xs = pick_random_points(a,b,N)
    return (b-a)/N*sum([f(x) for x in xs])
```

[22]:
```
method2(g,0,1,1000)
```

[22]:
```
np.float64(0.5167287163541635)
```

[23]:
```
import pandas as pd
```

[24]:
```
results = pd.DataFrame([ methd
```

[ ]:
```

```