BayesianSimulatedData1

March 3, 2025

[1]:
```
from src.utils.TestHelper import TestHelper
```

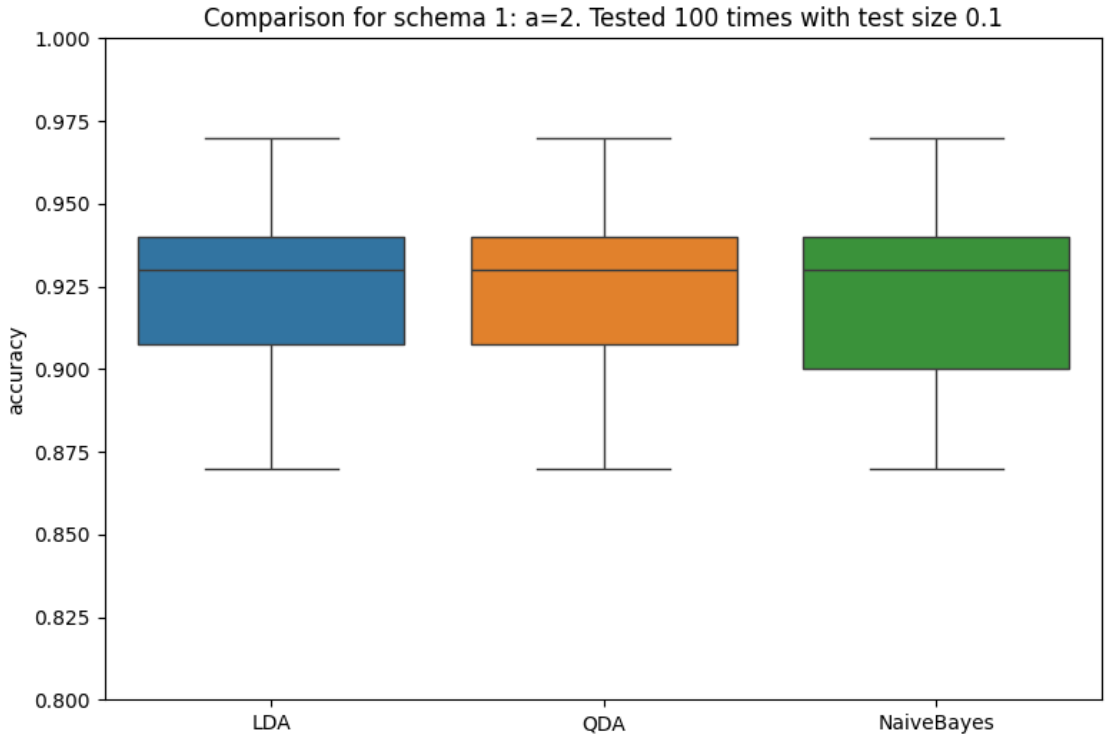
[2]:
```
tester = TestHelper()
rho = 0.5
a = [0.1, 0.5, 1, 2, 3, 5]
test_sizes = [0.1, 0.2, 0.3, 0.4]
```

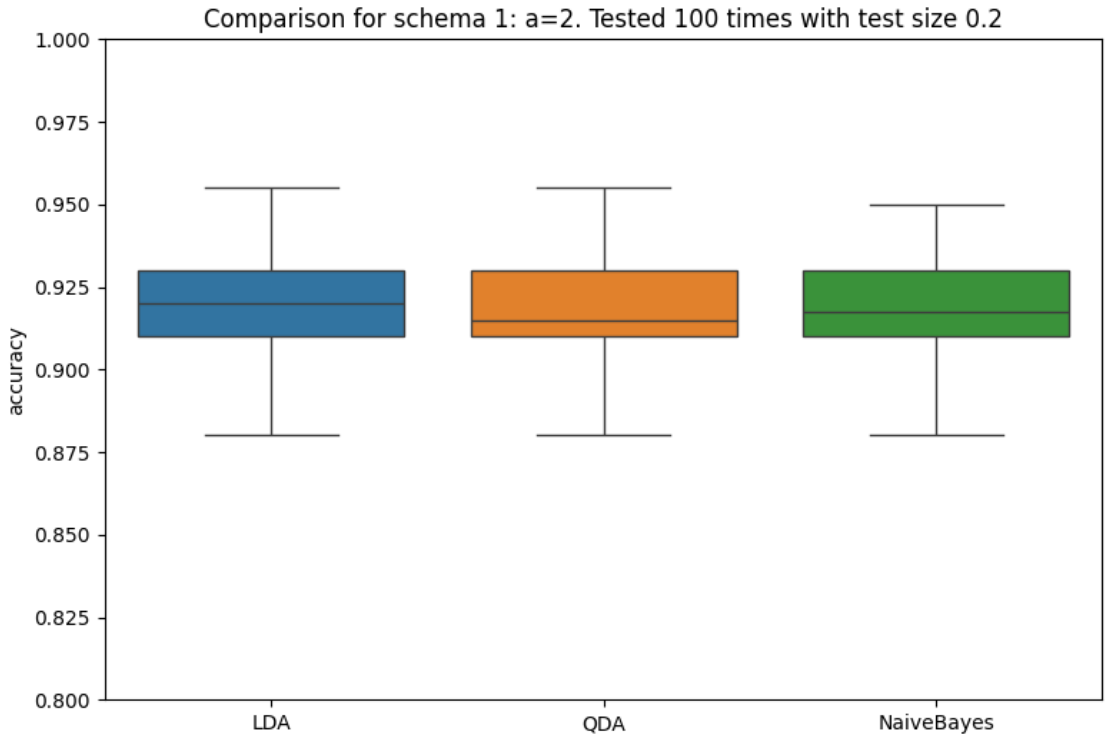
1 1. Experiment - test sizes for selected value a

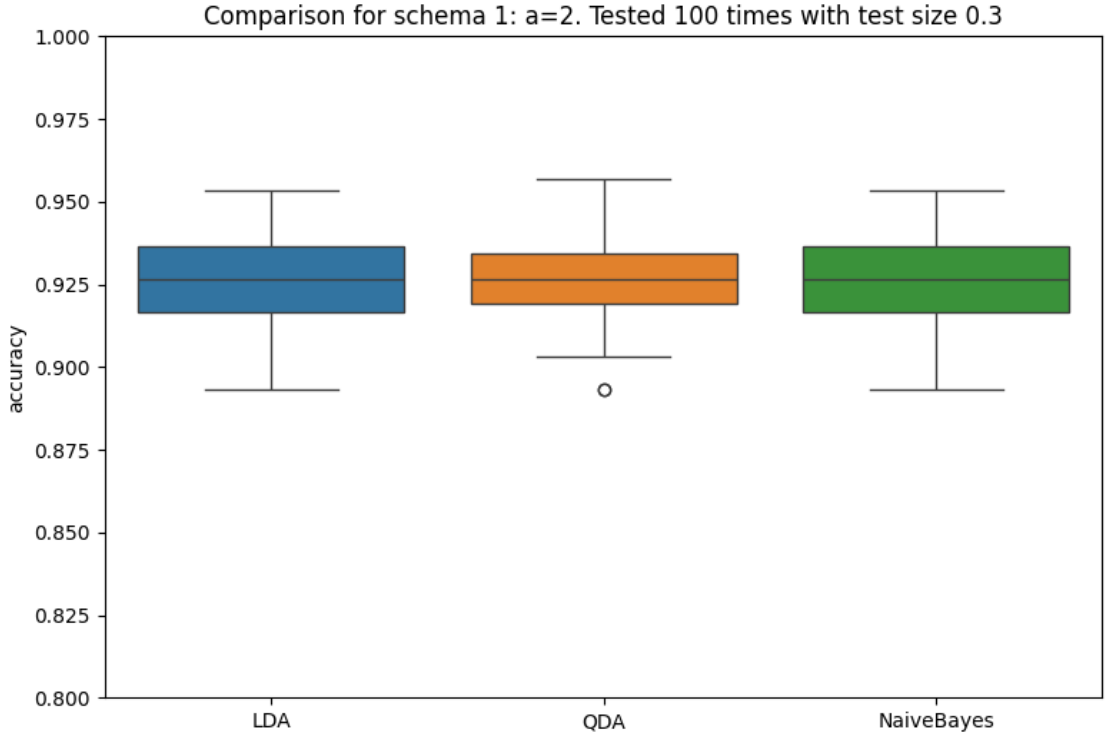
[3]:
```
tester.ylim = (0.8,1)
```

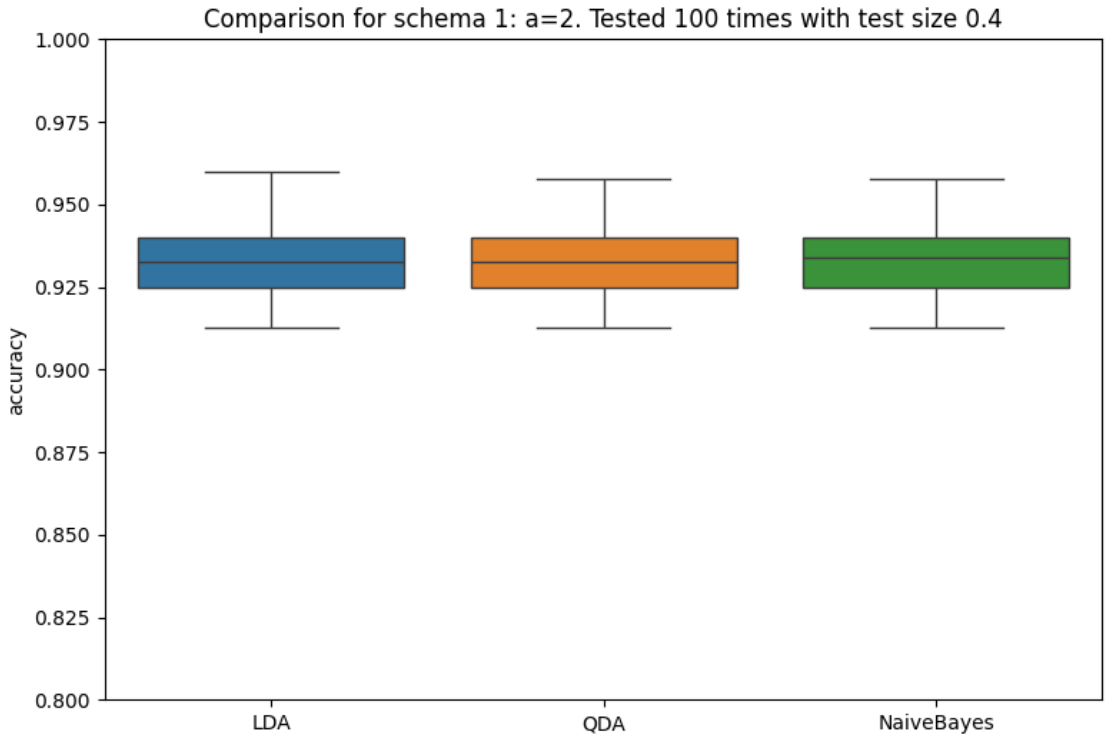
1.1 Schema 1

[4]:
```
for test_size in test_sizes:
    tester.test_scheme_1(2, 100, test_size)
```



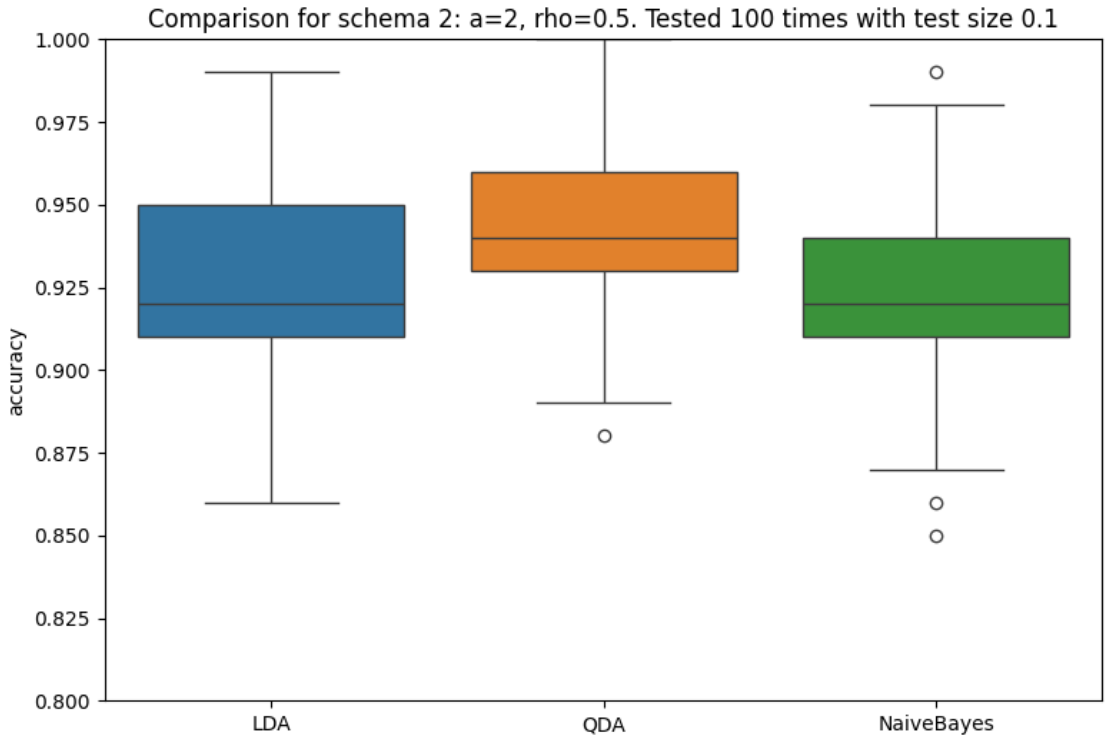

Comparison for schema 1: a=2. Tested 100 times with test size 0.2
accuracy
1.000
0.975
0.950
0.925
0.900
0.875
0.850
0.825
0.800
LDA
QDA
NaiveBayes

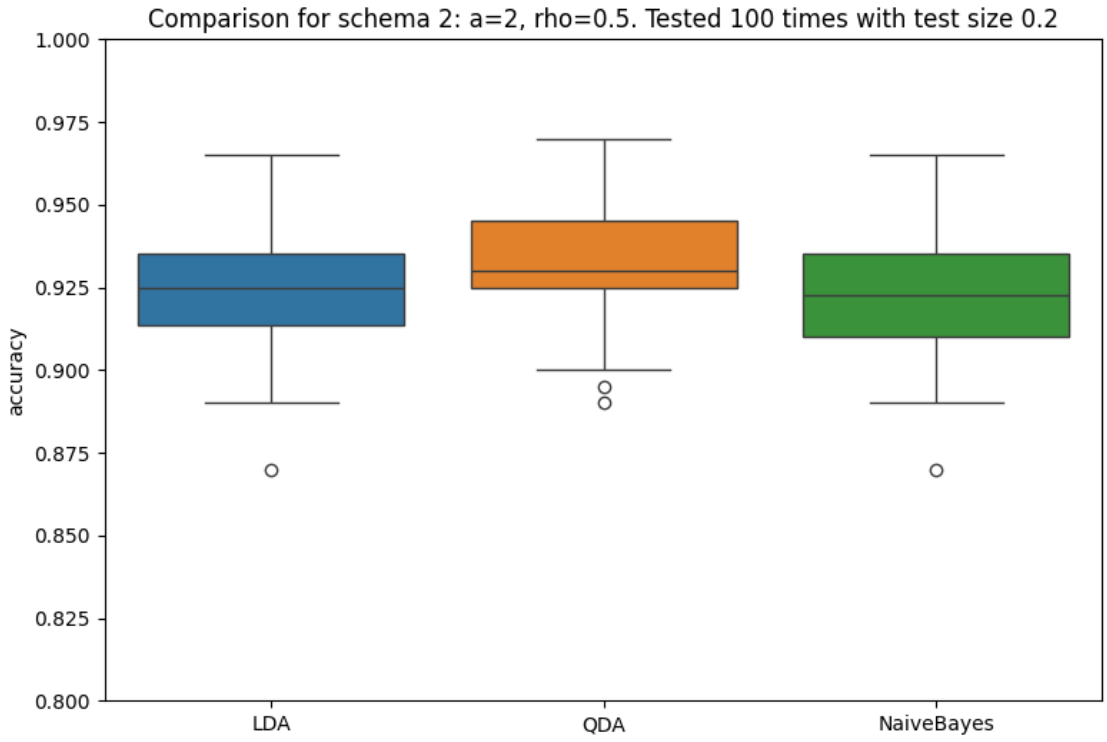

Comparison for schema 1: a=2. Tested 100 times with test size 0.3
accuracy
1.000
0.975
0.950
0.925
0.900
0.875
0.850
0.825
0.800
LDA
QDA
NaiveBayes

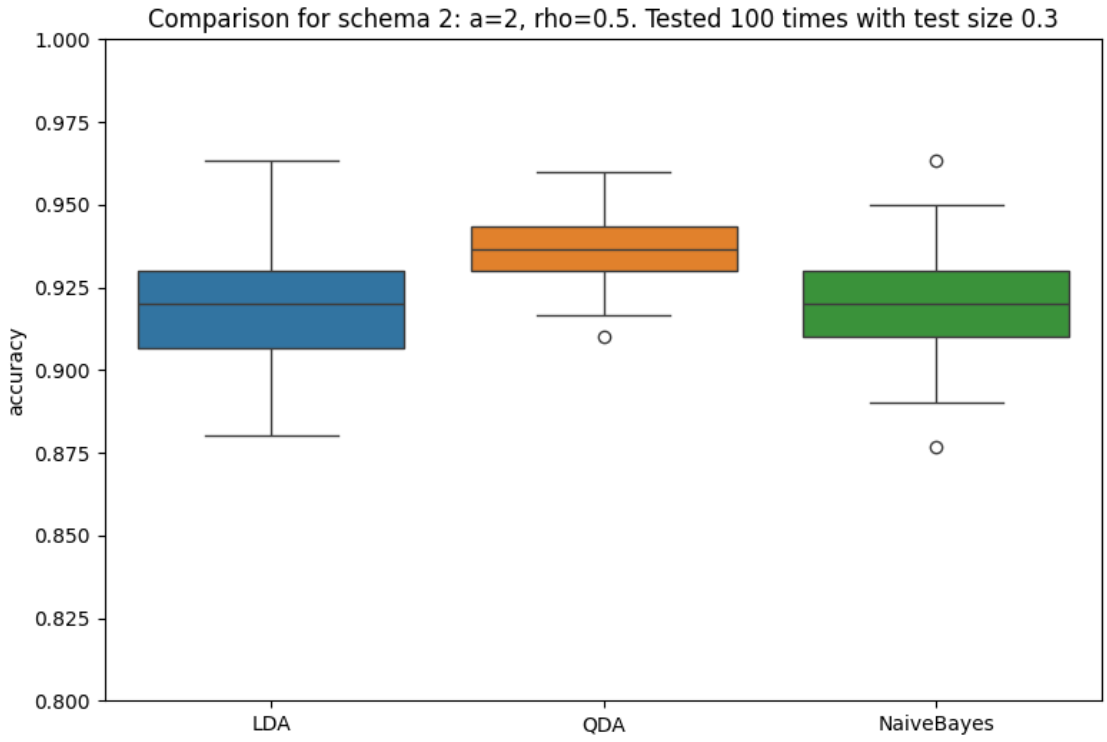


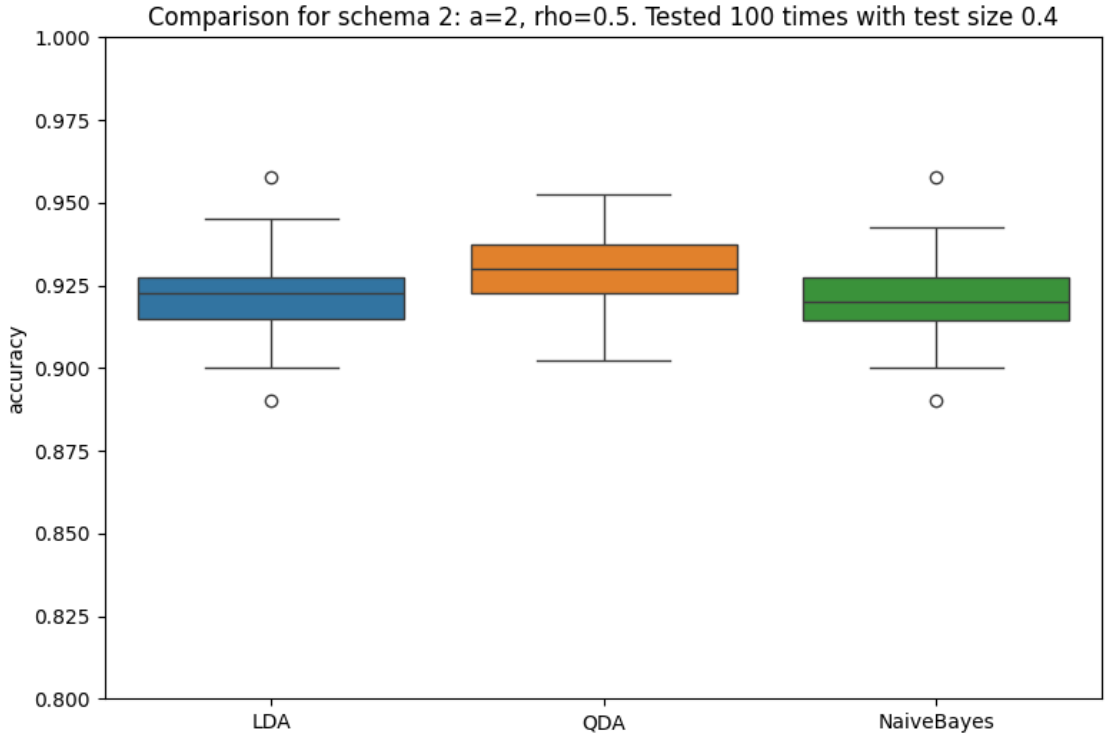
1.2 Schema 2

[5]:
```
for test_size in test_sizes:
    tester.test_scheme_2(2, rho, 100, test_size)
```


Comparison for schema 2: a=2, rho=0.5. Tested 100 times with test size 0.1
accuracy
1.000
0.975
0.950
0.925
0.900
0.875
0.850
0.825
0.800
LDA
QDA
NaiveBayes


Comparison for schema 2: a=2, rho=0.5. Tested 100 times with test size 0.2
accuracy
1.000
0.975
0.950
0.925
0.900
0.875
0.850
0.825
0.800
LDA
QDA
NaiveBayes


Comparison for schema 2: a=2, rho=0.5. Tested 100 times with test size 0.3
accuracy
1.000
0.975
0.950
0.925
0.900
0.875
0.850
0.825
0.800
LDA
QDA
NaiveBayes


Comparison for schema 2: a=2, rho=0.5. Tested 100 times with test size 0.4
accuracy
1.000
0.975
0.950
0.925
0.900
0.875
0.850
0.825
0.800
LDA
QDA
NaiveBayes

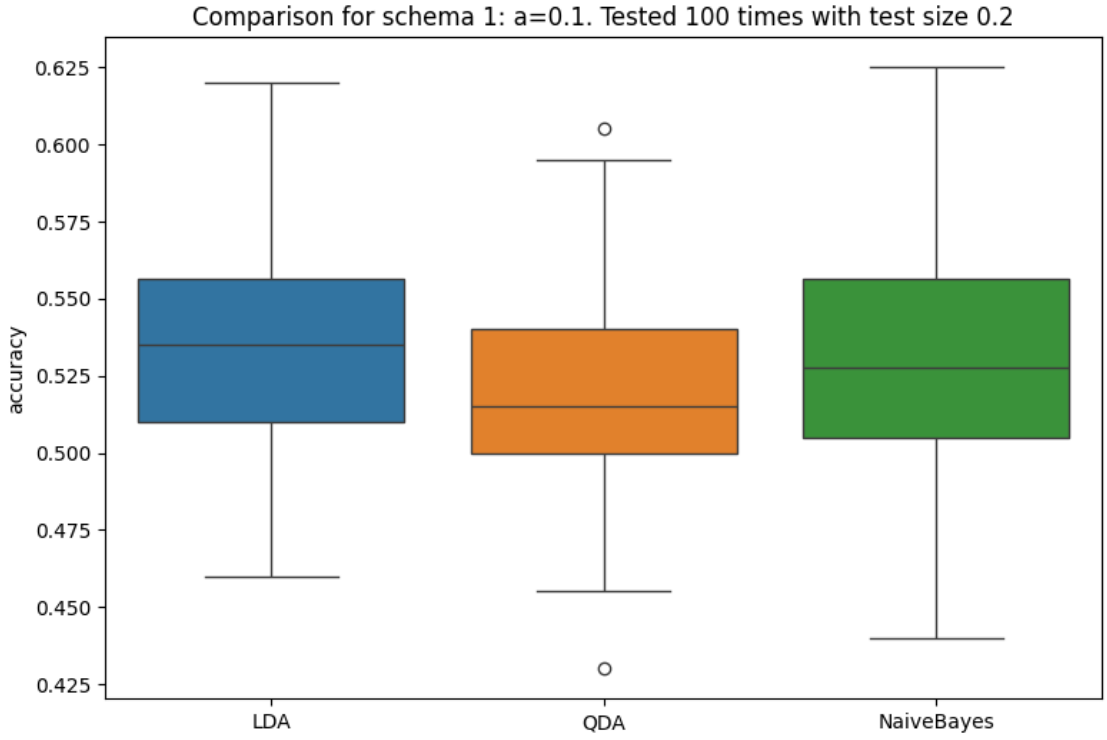
1.2.1 Key observations

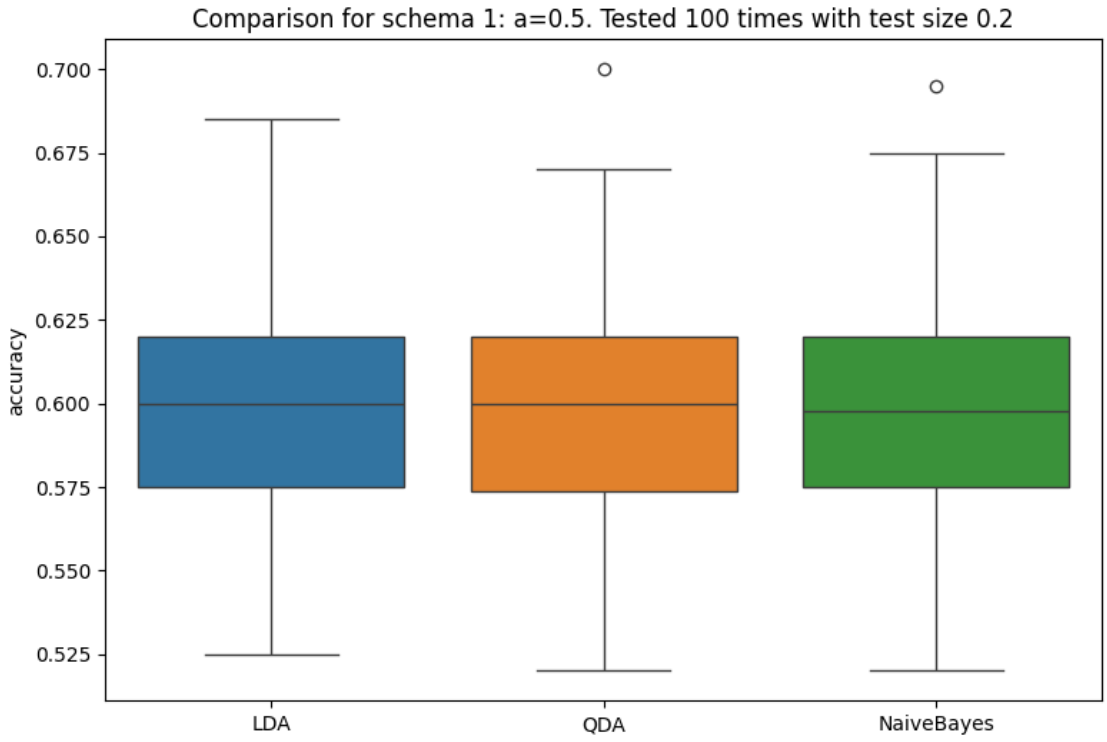
2 2. Experiment - different values a

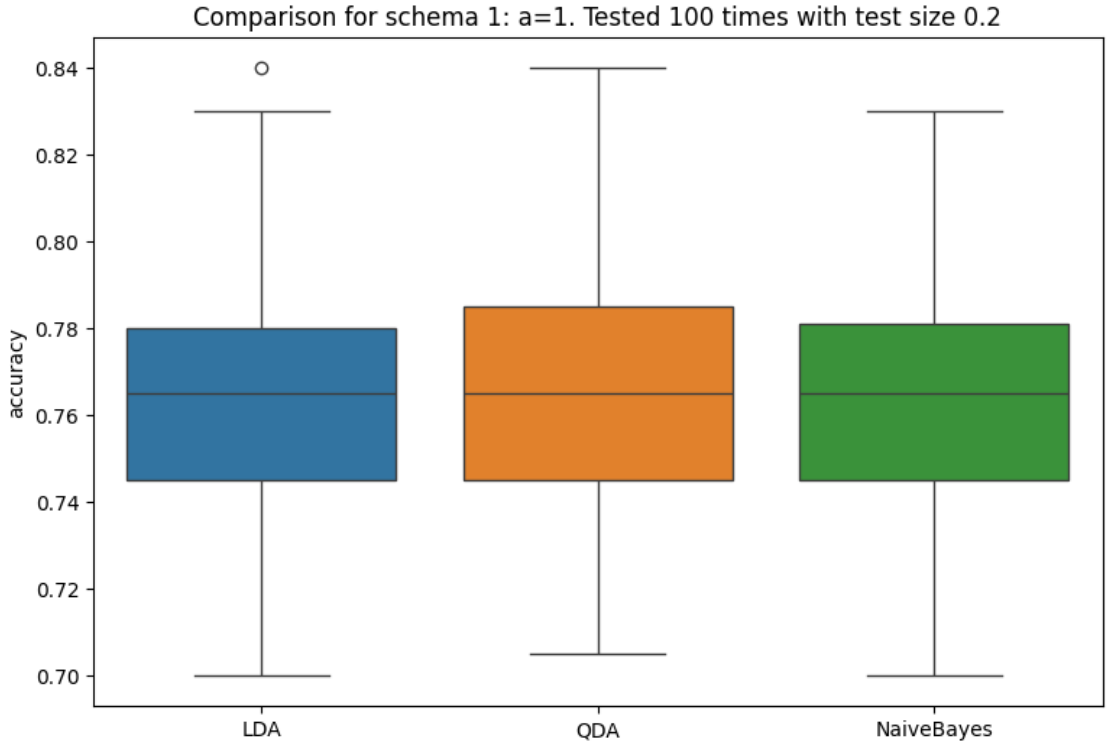
[6]:
```
tester.ylim = None
```

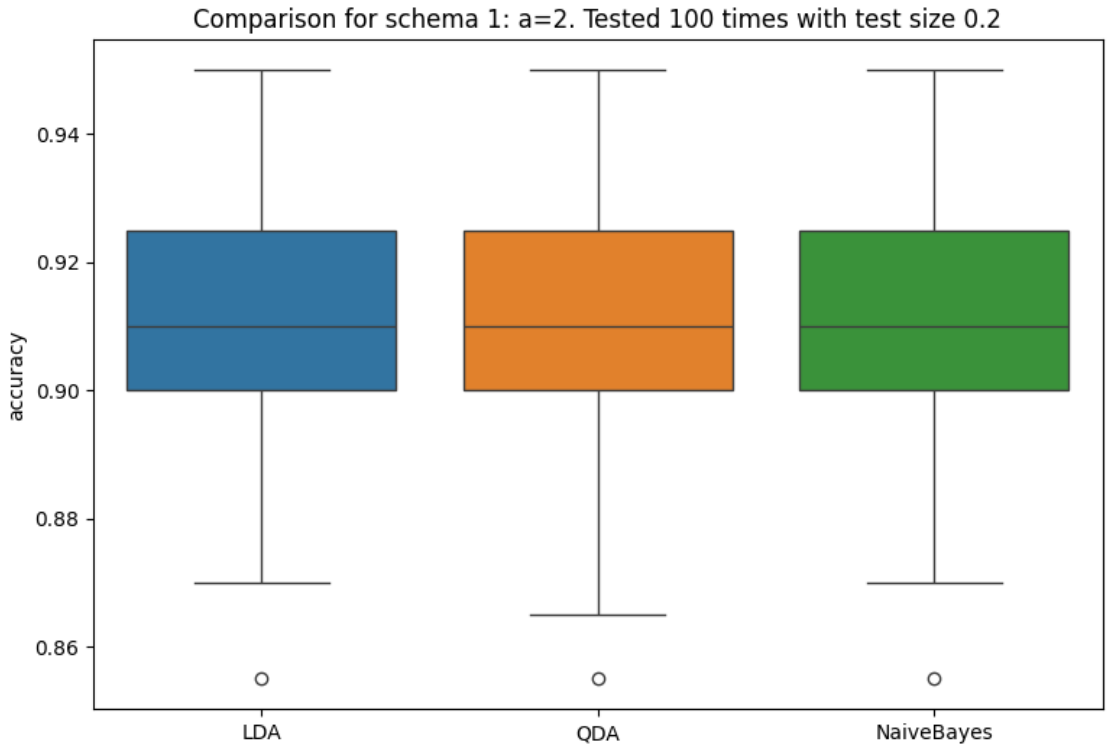
2.1 Schema 1

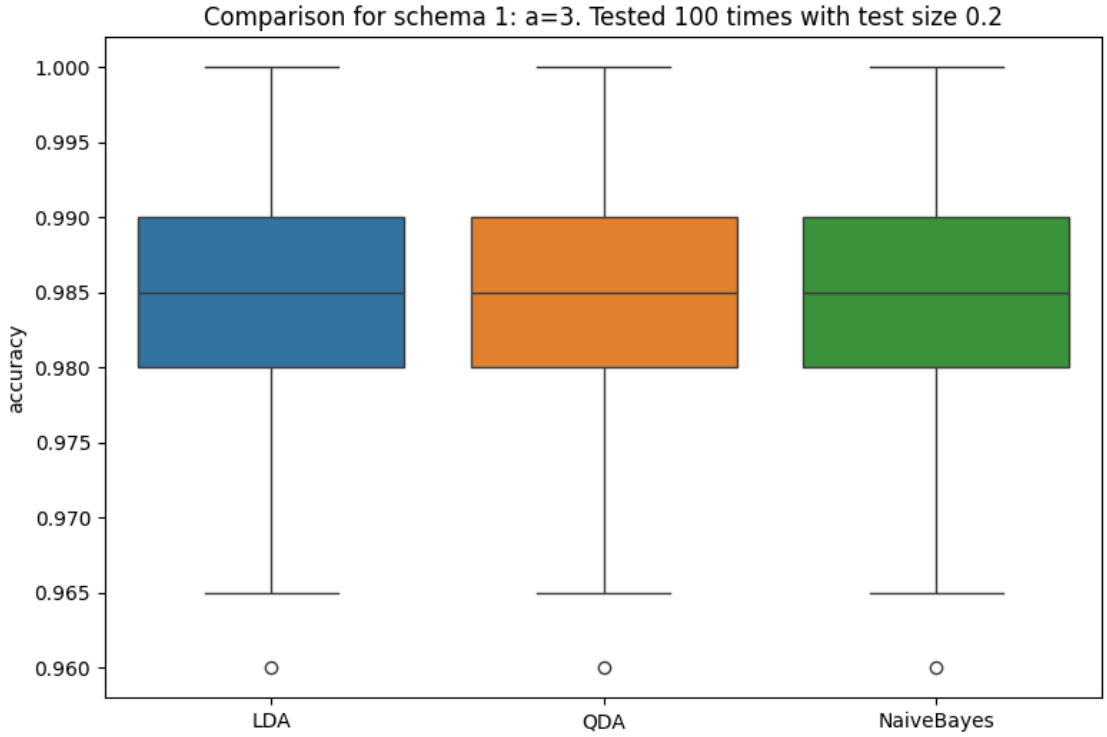
[7]:
```
for a_i in a:
    tester.test_scheme_1(a_i, 100)
```

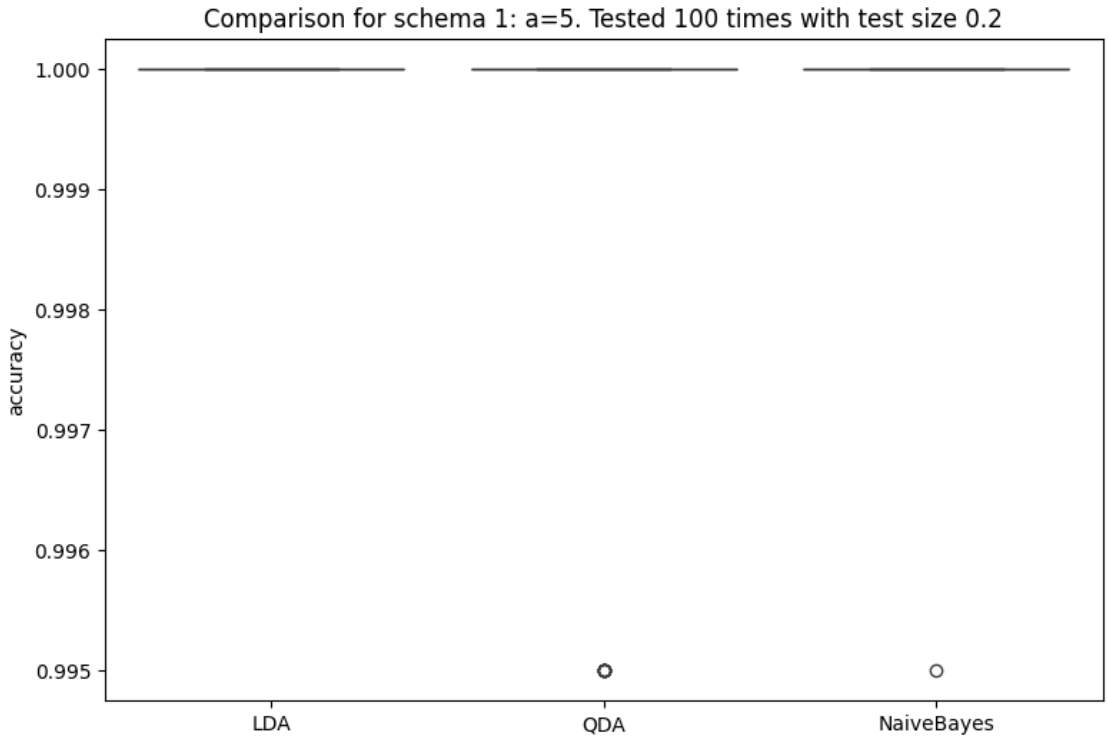



Comparison for schema 1: a=0.5. Tested 100 times with test size 0.2
accuracy
0.700
0.675
0.650
0.625
0.600
0.575
0.550
0.525
LDA
QDA
NaiveBayes


Comparison for schema 1: a=1. Tested 100 times with test size 0.2
accuracy
0.84
0.82
0.80
0.78
0.76
0.74
0.72
0.70
LDA
QDA
NaiveBayes

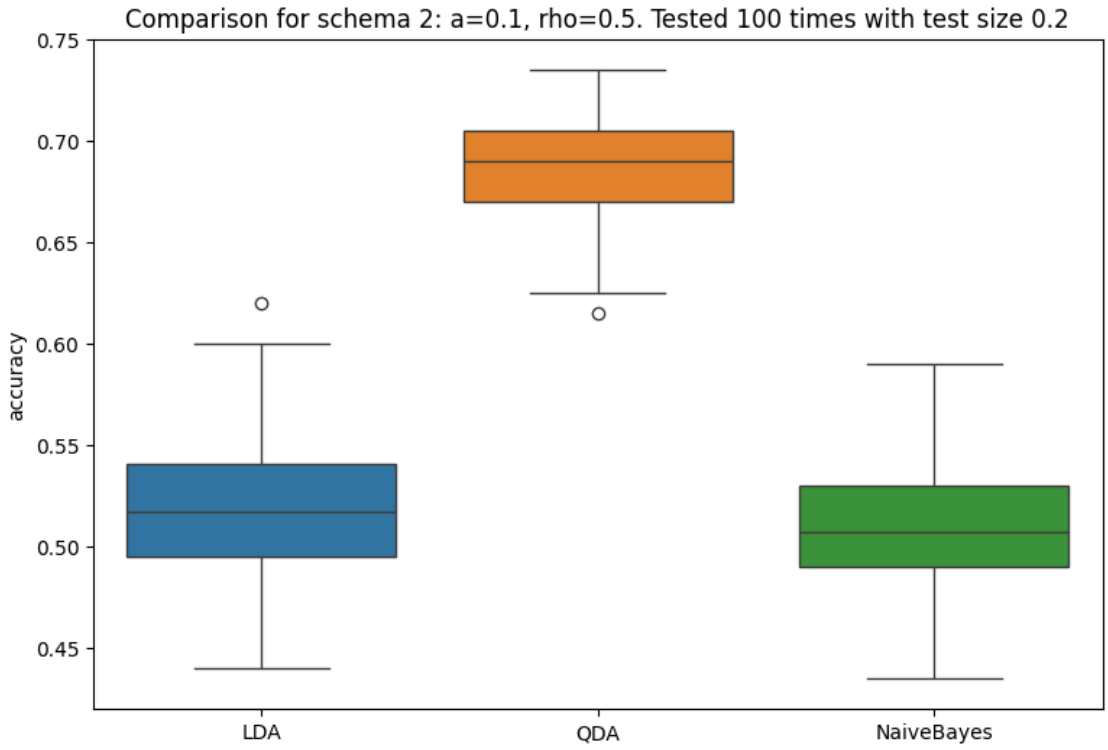

Comparison for schema 1: a=2. Tested 100 times with test size 0.2
accuracy
0.94
0.92
0.90
0.88
0.86
LDA
QDA
NaiveBayes

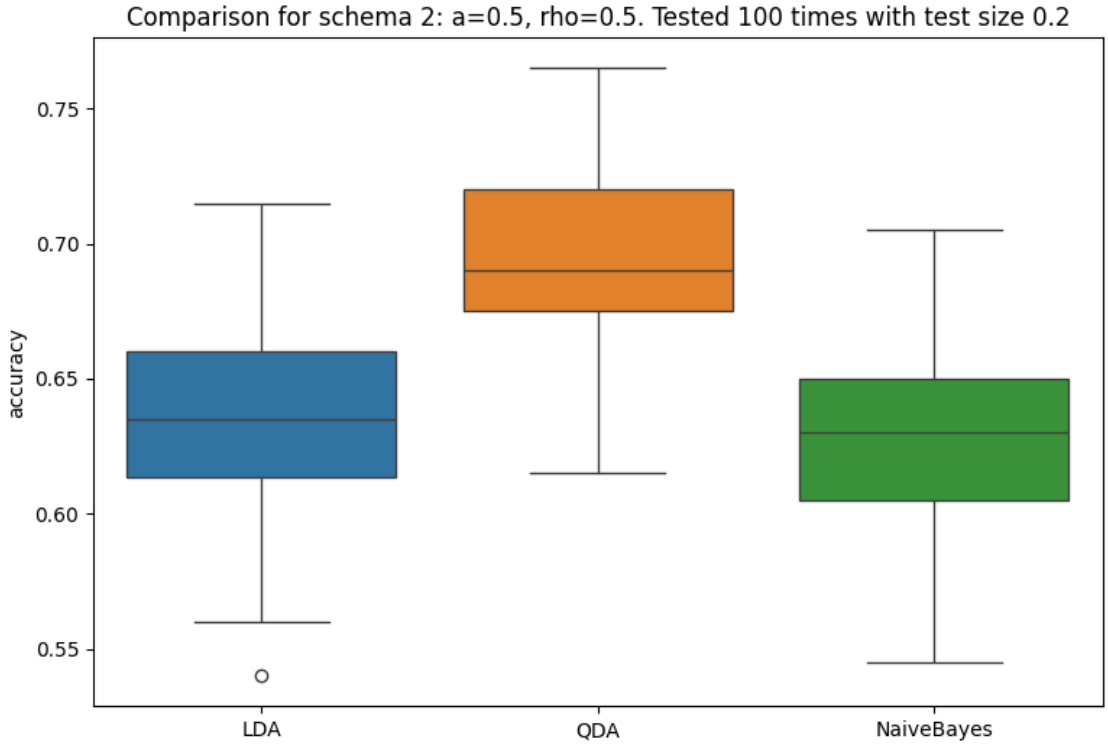

Comparison for schema 1: a=3. Tested 100 times with test size 0.2
accuracy
1.000
0.995
0.990
0.985
0.980
0.975
0.970
0.965
0.960
LDA
QDA
NaiveBayes

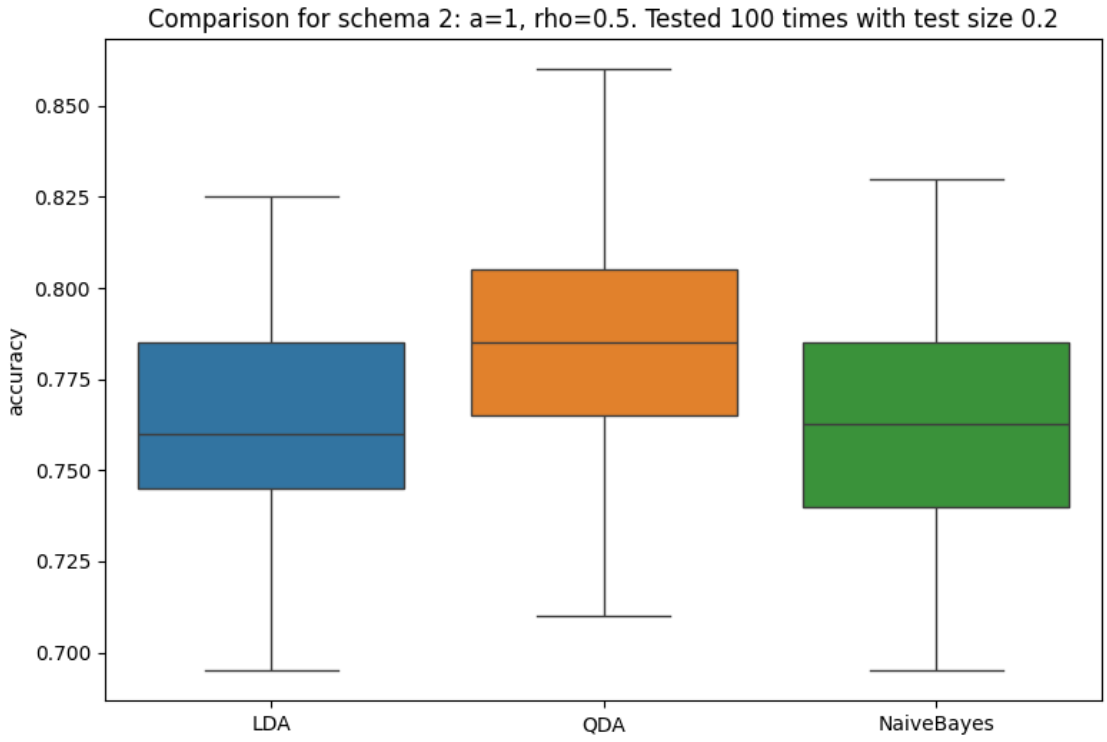


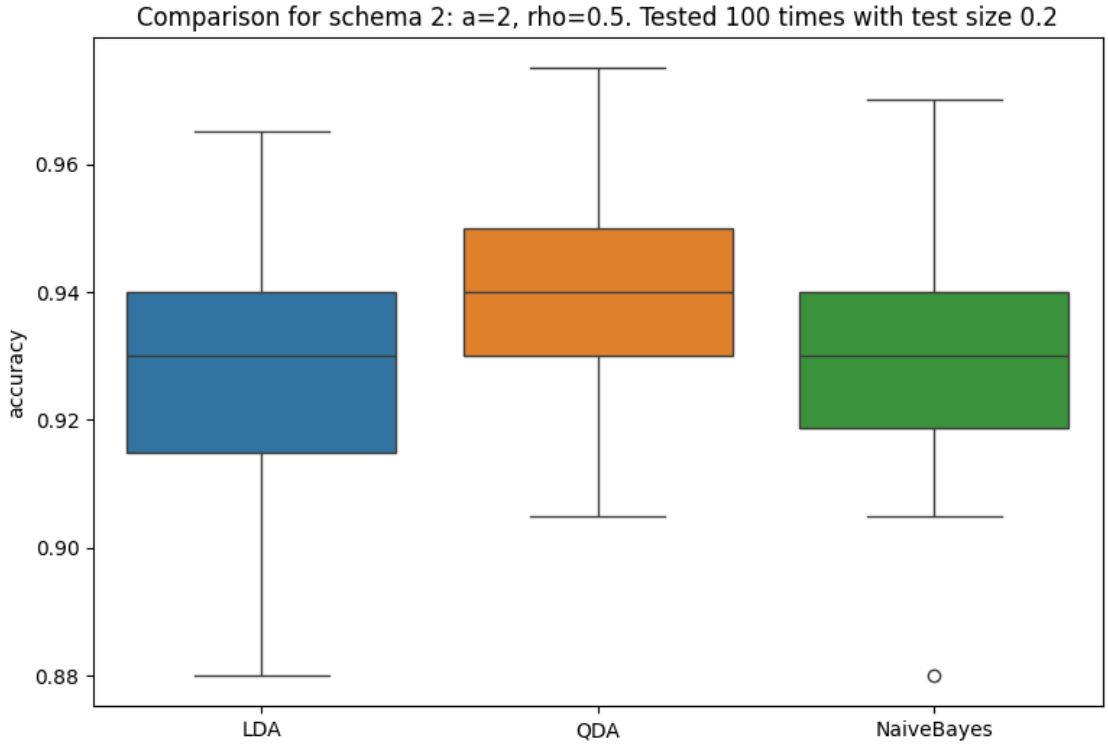
2.2 Scheme 2

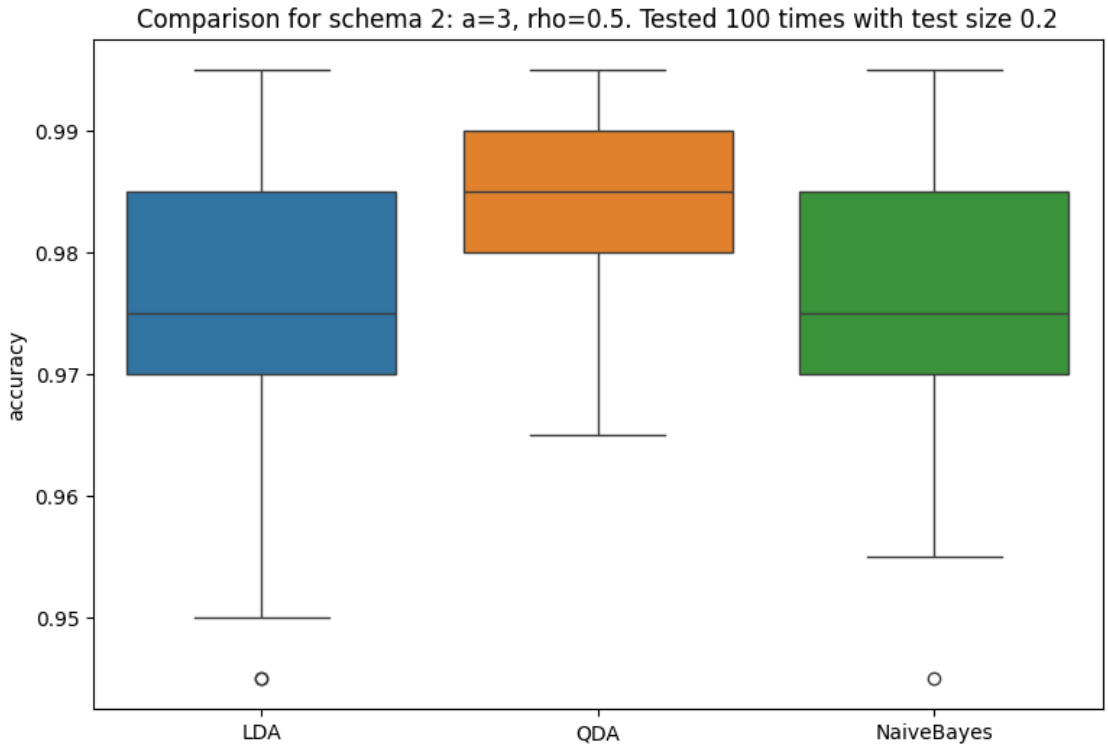
[8]:
```
for a_i in a:
    tester.test_scheme_2(a_i, rho, 100)
```

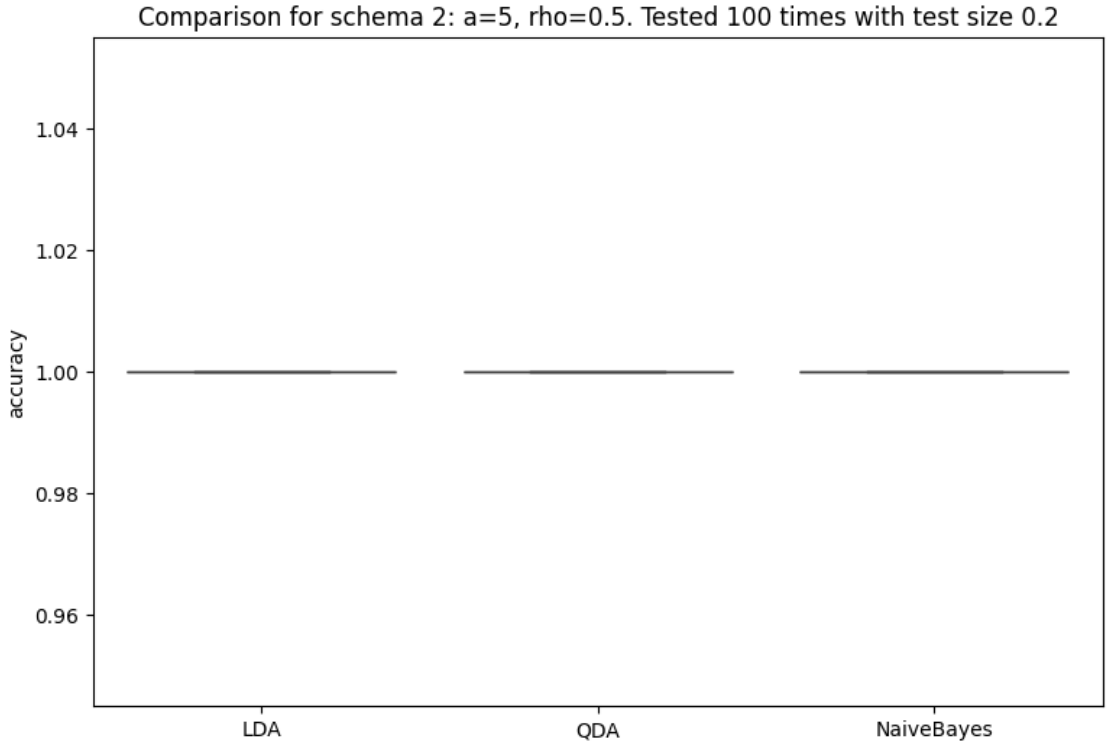

Comparison for schema 2: a=0.1, rho=0.5. Tested 100 times with test size 0.2
accuracy
0.75
0.70
0.65
0.60
0.55
0.50
0.45
LDA
QDA
NaiveBayes


Comparison for schema 2: a=0.5, rho=0.5. Tested 100 times with test size 0.2
accuracy
0.75
0.70
0.65
0.60
0.55
LDA
QDA
NaiveBayes


Comparison for schema 2: a=1, rho=0.5. Tested 100 times with test size 0.2
accuracy
0.850
0.825
0.800
0.775
0.750
0.725
0.700
LDA
QDA
NaiveBayes


Comparison for schema 2: a=2, rho=0.5. Tested 100 times with test size 0.2
accuracy
0.96
0.94
0.92
0.90
0.88
LDA
QDA
NaiveBayes


Comparison for schema 2: a=3, rho=0.5. Tested 100 times with test size 0.2
accuracy
0.99
0.98
0.97
0.96
0.95
LDA
QDA
NaiveBayes


Comparison for schema 2: a=5, rho=0.5. Tested 100 times with test size 0.2
accuracy
1.04
1.02
1.00
0.98
0.96
LDA
QDA
NaiveBayes

2.2.1 Key observations