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(base) C:\Users\chris\Desktop\EECS 690\ChristopherAriagno_Assignment4>python
CompareFeatureSelectionMethods.py
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Part 1: Decision Tree (DecisionTreeClassifier)

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Accuracy:

0.9466666666666667

Confusion Matrix:

```
[[50 0 0]
```

```
 [ 0 47 3]
```

```
 [ 0 5 45]]
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Features Used:

sepal-length sepal-width petal-length petal-width

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PART 2

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Part 2: PCA Feature Confusion Matrix

Eigenvalues:

```
[4.22484077 0.24224357 0.07852391 0.02368303]
```

Eigenvectors:

```
[[ 0.36158968 -0.65653988 -0.58099728  0.31725455]
```

```
 [-0.08226889 -0.72971237  0.59641809 -0.32409435]
```

```
 [ 0.85657211  0.1757674  0.07252408 -0.47971899]
```

```
 [ 0.35884393  0.07470647  0.54906091  0.75112056]]
```

PoV of 0.924616207174268

```
[[50 0 0]
```

```
 [ 0 44 6]
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[ 0 7 43]]

Accuracy: 0.9133333333333333

Features Used:

sepal-length-prime sepal-width-prime petal-length-prime petal-width-prime

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PART 3

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Iteration: 0

Subset of features: Original

Accuracy: 0.9533333333333334

Pr[Accept]: 1.0

Random Uniform: 0.5934628917910056

Status: Accept

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Iteration: 1

Subset of features: Original

Accuracy: 0.9533333333333334

Pr[Accept]: 0.9792395078401485

Random Uniform: 0.8881270575094966

Status: Accept

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Iteration: 2

Subset of features: Original

Accuracy: 0.9533333333333334

Pr[Accept]: 0.9455920346643839

Random Uniform: 0.027467053196537417

Status: Accept

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Iteration: 3

Subset of features: New?

Accuracy: 0.9266666666666666

Pr[Accept]: N/A

Random Uniform: N/A

Status: Improved prime > original

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Iteration: 4

Subset of features: New?

Accuracy: 0.9533333333333334

Pr[Accept]: N/A

Random Uniform: N/A

Status: Improved prime > original

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Iteration: 5

Subset of features: Original

Accuracy: 0.9466666666666667

Pr[Accept]: 0.899754075162413

Random Uniform: 0.32726614984913804

Status: Accept

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Iteration: 6

Subset of features: Original

Accuracy: 0.9466666666666667

Pr[Accept]: 0.8809445777387951

Random Uniform: 0.7824266639263542

Status: Accept

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Iteration: 7

Subset of features: New?

Accuracy: 0.9533333333333334

Pr[Accept]: N/A

Random Uniform: N/A

Status: Improved prime > original

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Iteration: 8

Subset of features: Original

Accuracy: 0.9266666666666666

Pr[Accept]: 1.0

Random Uniform: 0.912141540186557

Status: Accept

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Iteration: 9

Subset of features: New?

Accuracy: 0.9533333333333334

Pr[Accept]: N/A

Random Uniform: N/A

Status: Improved prime > original

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Iteration: 10

Subset of features: Original

Accuracy: 0.9533333333333334

Pr[Accept]: 1.0

Random Uniform: 0.33069361011116005

Status: Accept

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Iteration: 11

Subset of features: Original

Accuracy: 0.9533333333333334

Pr[Accept]: 0.735141480591684

Random Uniform: 0.052056991628424365

Status: Accept

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Iteration: 12

Subset of features: Original

Accuracy: 0.9266666666666666

Pr[Accept]: 0.9172906171832589

Random Uniform: 0.036665931262788276

Status: Accept

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Iteration: 13

Subset of features: New?

Accuracy: 0.9533333333333334

Pr[Accept]: N/A

Random Uniform: N/A

Status: Improved prime > original

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Iteration: 14

Subset of features: Original

Accuracy: 0.9533333333333334

Pr[Accept]: 0.6759687771806834

Random Uniform: 0.49217918321862963

Status: Accept

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Iteration: 15

Subset of features: Original

Accuracy: 0.92

Pr[Accept]: 1.0

Random Uniform: 0.49192218468058735

Status: Accept

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Iteration: 16

Subset of features: Original

Accuracy: 0.9533333333333334

Pr[Accept]: 0.639190691383878

Random Uniform: 0.17739133863706058

Status: Accept

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Iteration: 17

Subset of features: Original

Accuracy: 0.9466666666666667

Pr[Accept]: 0.6982661608895739

Random Uniform: 0.5325870111974381

Status: Accept

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Iteration: 18

Subset of features: Original

Accuracy: 0.9533333333333334

Pr[Accept]: 1.0

Random Uniform: 0.4425482224633852

Status: Accept

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Iteration: 19

Subset of features: New?

Accuracy: 0.9266666666666666

Pr[Accept]: N/A

Random Uniform: N/A

Status: Improved prime > original

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Iteration: 20

Subset of features: Original

Accuracy: 0.9533333333333334

Pr[Accept]: 0.49693268769035864

Random Uniform: 0.5035944585489895

Status: Discard

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Iteration: 21

Subset of features: Original

Accuracy: 0.9533333333333334

Pr[Accept]: 0.8634207641628501

Random Uniform: 0.7746970425623644

Status: Accept

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Iteration: 22

Subset of features: Original

Accuracy: 0.9266666666666666

Pr[Accept]: 0.8536163873137039

Random Uniform: 0.43675749221623394

Status: Accept

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Iteration: 23

Subset of features: Original

Accuracy: 0.9266666666666666

Pr[Accept]: 1.0

Random Uniform: 0.651911814655072

Status: Accept

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Iteration: 24

Subset of features: New?

Accuracy: 0.9533333333333334

Pr[Accept]: N/A

Random Uniform: N/A

Status: Improved prime > original

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Iteration: 25

Subset of features: New?

Accuracy: 0.9533333333333334

Pr[Accept]: N/A

Random Uniform: N/A

Status: Improved prime > original

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Iteration: 26

Subset of features: New?

Accuracy: 0.9533333333333334

Pr[Accept]: N/A

Random Uniform: N/A

Status: Improved prime > original

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Iteration: 27

Subset of features: Original

Accuracy: 0.9266666666666666

Pr[Accept]: 0.8234564586280775

Random Uniform: 0.3400568476789555

Status: Accept

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Iteration: 28

Subset of features: New?

Accuracy: 0.9266666666666666

Pr[Accept]: N/A

Random Uniform: N/A

Status: Improved prime > original

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Iteration: 29

Subset of features: Original

Accuracy: 0.9533333333333334

Pr[Accept]: 0.4443295282045839

Random Uniform: 0.4659500782126622

Status: Discard

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Iteration: 30

Subset of features: Original

Accuracy: 0.9266666666666666

Pr[Accept]: 1.0

Random Uniform: 0.5524650669937351

Status: Accept

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Iteration: 31

Subset of features: New?

Accuracy: 0.9533333333333334

Pr[Accept]: N/A

Random Uniform: N/A

Status: Improved prime > original

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Iteration: 32

Subset of features: New?

Accuracy: 0.9533333333333334

Pr[Accept]: N/A

Random Uniform: N/A

Status: Improved prime > original

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Iteration: 33

Subset of features: Original

Accuracy: 0.9533333333333334

Pr[Accept]: 0.3972947131977105

Random Uniform: 0.5709282643048115

Status: Discard

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Iteration: 34

Subset of features: Original

Accuracy: 0.9466666666666667

Pr[Accept]: 0.4875756314434643

Random Uniform: 0.18541667415475604

Status: Accept

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Iteration: 35

Subset of features: New?

Accuracy: 0.9533333333333334

Pr[Accept]: N/A

Random Uniform: N/A

Status: Improved prime > original

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Iteration: 36

Subset of features: Original

Accuracy: 0.9266666666666666

Pr[Accept]: 0.7718285757472982

Random Uniform: 0.5562608988931992

Status: Accept

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Iteration: 37

Subset of features: New?

Accuracy: 0.9466666666666667

Pr[Accept]: N/A

Random Uniform: N/A

Status: Improved prime > original

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Iteration: 38

Subset of features: Original

Accuracy: 0.9533333333333334

Pr[Accept]: 1.0

Random Uniform: 0.32230080618664636

Status: Accept

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Iteration: 39

Subset of features: Original

Accuracy: 0.9466666666666667

Pr[Accept]: 1.0

Random Uniform: 0.7574604020594097

Status: Accept

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Iteration: 40

Subset of features: Original

Accuracy: 0.9533333333333334

Pr[Accept]: 0.24694209609516352

Random Uniform: 0.09379726661011079

Status: Accept

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Iteration: 41

Subset of features: Original

Accuracy: 0.9266666666666666

Pr[Accept]: 1.0

Random Uniform: 0.08966080648721375

Status: Accept

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Iteration: 42

Subset of features: Original

Accuracy: 0.9533333333333334

Pr[Accept]: 1.0

Random Uniform: 0.06402318892168701

Status: Accept

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Iteration: 43

Subset of features: New?

Accuracy: 0.9533333333333334

Pr[Accept]: N/A

Random Uniform: N/A

Status: Improved prime > original

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Iteration: 44

Subset of features: Original

Accuracy: 0.9533333333333334

Pr[Accept]: 0.2920678236914134

Random Uniform: 0.8719300324489189

Status: Discard

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Iteration: 45

Subset of features: Original

Accuracy: 0.9266666666666666

Pr[Accept]: 1.0

Random Uniform: 0.06647158732701786

Status: Accept

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Iteration: 46

Subset of features: Original

Accuracy: 0.9533333333333334

Pr[Accept]: 1.0

Random Uniform: 0.15351526038700802

Status: Accept

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Iteration: 47

Subset of features: Original

Accuracy: 0.9533333333333334

Pr[Accept]: 1.0

Random Uniform: 0.13513747313784374

Status: Accept

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Iteration: 48

Subset of features: Original

Accuracy: 0.9266666666666666

Pr[Accept]: 1.0

Random Uniform: 0.1675459966055911

Status: Accept

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Iteration: 49

Subset of features: New?

Accuracy: 0.9533333333333334

Pr[Accept]: N/A

Random Uniform: N/A

Status: Improved prime > original

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Iteration: 50

Subset of features: New?

Accuracy: 0.9533333333333334

Pr[Accept]: N/A

Random Uniform: N/A

Status: Improved prime > original

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Iteration: 51

Subset of features: Original

Accuracy: 0.9466666666666667

Pr[Accept]: 1.0

Random Uniform: 0.004266948731987519

Status: Accept

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Iteration: 52

Subset of features: New?

Accuracy: 0.9533333333333334

Pr[Accept]: N/A

Random Uniform: N/A

Status: Improved prime > original

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Iteration: 53

Subset of features: New?

Accuracy: 0.9533333333333334

Pr[Accept]: N/A

Random Uniform: N/A

Status: Improved prime > original

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Iteration: 54

Subset of features: Original

Accuracy: 0.9466666666666667

Pr[Accept]: 0.31954886638666147

Random Uniform: 0.7739878761726279

Status: Discard

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Iteration: 55

Subset of features: New?

Accuracy: 0.9466666666666667

Pr[Accept]: N/A

Random Uniform: N/A

Status: Improved prime > original

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Iteration: 56

Subset of features: New?

Accuracy: 0.9466666666666667

Pr[Accept]: N/A

Random Uniform: N/A

Status: Improved prime > original

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Iteration: 57

Subset of features: Original

Accuracy: 0.9533333333333334

Pr[Accept]: 0.20302917431976003

Random Uniform: 0.955777126791702

Status: Discard

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Iteration: 58

Subset of features: New?

Accuracy: 0.9533333333333334

Pr[Accept]: N/A

Random Uniform: N/A

Status: Improved prime > original

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Iteration: 59

Subset of features: Original

Accuracy: 0.92

Pr[Accept]: 1.0

Random Uniform: 0.960663522389918

Status: Accept

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Iteration: 60

Subset of features: Original

Accuracy: 0.9466666666666667

Pr[Accept]: 1.0

Random Uniform: 0.8317872247048215

Status: Accept

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Iteration: 61

Subset of features: New?

Accuracy: 0.9533333333333334

Pr[Accept]: N/A

Random Uniform: N/A

Status: Improved prime > original

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Iteration: 62

Subset of features: New?

Accuracy: 0.9533333333333334

Pr[Accept]: N/A

Random Uniform: N/A

Status: Improved prime > original

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Iteration: 63

Subset of features: Original

Accuracy: 0.9533333333333334

Pr[Accept]: 0.17166029876664463

Random Uniform: 0.4451469119954907

Status: Discard

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Iteration: 64

Subset of features: New?

Accuracy: 0.9266666666666666

Pr[Accept]: N/A

Random Uniform: N/A

Status: Improved prime > original

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Iteration: 65

Subset of features: Original

Accuracy: 0.9533333333333334

Pr[Accept]: 1.0

Random Uniform: 0.7156771928229163

Status: Accept

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Iteration: 66

Subset of features: Original

Accuracy: 0.9533333333333334

Pr[Accept]: 0.6303131865967179

Random Uniform: 0.26271091544758474

Status: Accept

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Iteration: 67

Subset of features: Original

Accuracy: 0.9466666666666667

Pr[Accept]: 0.15147662692432579

Random Uniform: 0.03273810322120485

Status: Accept

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Iteration: 68

Subset of features: New?

Accuracy: 0.9533333333333334

Pr[Accept]: N/A

Random Uniform: N/A

Status: Improved prime > original

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Iteration: 69

Subset of features: New?

Accuracy: 0.9533333333333334

Pr[Accept]: N/A

Random Uniform: N/A

Status: Improved prime > original

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Iteration: 70

Subset of features: New?

Accuracy: 0.9533333333333334

Pr[Accept]: N/A

Random Uniform: N/A

Status: Improved prime > original

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Iteration: 71

Subset of features: Original

Accuracy: 0.9533333333333334

Pr[Accept]: 1.0

Random Uniform: 0.05632611397978904

Status: Accept

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Iteration: 72

Subset of features: Original

Accuracy: 0.9533333333333334

Pr[Accept]: 0.13345565695137418

Random Uniform: 0.3010955125024256

Status: Discard

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Iteration: 73

Subset of features: New?

Accuracy: 0.9533333333333334

Pr[Accept]: N/A

Random Uniform: N/A

Status: Improved prime > original

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Iteration: 74

Subset of features: New?

Accuracy: 0.9533333333333334

Pr[Accept]: N/A

Random Uniform: N/A

Status: Improved prime > original

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Iteration: 75

Subset of features: New?

Accuracy: 0.9533333333333334

Pr[Accept]: N/A

Random Uniform: N/A

Status: Improved prime > original

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Iteration: 76

Subset of features: Original

Accuracy: 0.9533333333333334

Pr[Accept]: 1.0

Random Uniform: 0.4494357044473424

Status: Accept

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Iteration: 77

Subset of features: Original

Accuracy: 0.9533333333333334

Pr[Accept]: 0.06772447165924096

Random Uniform: 0.4938026554781396

Status: Discard

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Iteration: 78

Subset of features: Original

Accuracy: 0.9533333333333334

Pr[Accept]: 1.0

Random Uniform: 0.1939142645741434

Status: Accept

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Iteration: 79

Subset of features: New?

Accuracy: 0.9466666666666667

Pr[Accept]: N/A

Random Uniform: N/A

Status: Improved prime > original

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Iteration: 80

Subset of features: Original

Accuracy: 0.9533333333333334

Pr[Accept]: 0.060980398823872975

Random Uniform: 0.5660199235750705

Status: Discard

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Iteration: 81

Subset of features: New?

Accuracy: 0.9533333333333334

Pr[Accept]: N/A

Random Uniform: N/A

Status: Improved prime > original

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Iteration: 82

Subset of features: Original

Accuracy: 0.92

Pr[Accept]: 1.0

Random Uniform: 0.36302205321703584

Status: Accept

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Iteration: 83

Subset of features: New?

Accuracy: 0.9533333333333334

Pr[Accept]: N/A

Random Uniform: N/A

Status: Improved prime > original

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Iteration: 84

Subset of features: New?

Accuracy: 0.9466666666666667

Pr[Accept]: N/A

Random Uniform: N/A

Status: Improved prime > original

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Iteration: 85

Subset of features: New?

Accuracy: 0.9533333333333334

Pr[Accept]: N/A

Random Uniform: N/A

Status: Improved prime > original

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Iteration: 86

Subset of features: Original

Accuracy: 0.9466666666666667

Pr[Accept]: 1.0

Random Uniform: 0.542674982654933

Status: Accept

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Iteration: 87

Subset of features: New?

Accuracy: 0.9533333333333334

Pr[Accept]: N/A

Random Uniform: N/A

Status: Improved prime > original

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Iteration: 88

Subset of features: Original

Accuracy: 0.9533333333333334

Pr[Accept]: 1.0

Random Uniform: 0.7257117284392355

Status: Accept

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Iteration: 89

Subset of features: New?

Accuracy: 0.9266666666666666

Pr[Accept]: N/A

Random Uniform: N/A

Status: Improved prime > original

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Iteration: 90

Subset of features: New?

Accuracy: 0.9533333333333334

Pr[Accept]: N/A

Random Uniform: N/A

Status: Improved prime > original

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Iteration: 91

Subset of features: New?

Accuracy: 0.9533333333333334

Pr[Accept]: N/A

Random Uniform: N/A

Status: Improved prime > original

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Iteration: 92

Subset of features: Original

Accuracy: 0.9266666666666666

Pr[Accept]: 1.0

Random Uniform: 0.9180124399835283

Status: Accept

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Iteration: 93

Subset of features: New?

Accuracy: 0.9533333333333334

Pr[Accept]: N/A

Random Uniform: N/A

Status: Improved prime > original

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Iteration: 94

Subset of features: New?

Accuracy: 0.9533333333333334

Pr[Accept]: N/A

Random Uniform: N/A

Status: Improved prime > original

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Iteration: 95

Subset of features: New?

Accuracy: 0.9533333333333334

Pr[Accept]: N/A

Random Uniform: N/A

Status: Improved prime > original

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Iteration: 96

Subset of features: Original

Accuracy: 0.9466666666666667

Pr[Accept]: 1.0

Random Uniform: 0.3285791798458938

Status: Accept

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Iteration: 97

Subset of features: Original

Accuracy: 0.9533333333333334

Pr[Accept]: 0.06631847829632874

Random Uniform: 0.053024613406691956

Status: Accept

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Iteration: 98

Subset of features: Original

Accuracy: 0.9533333333333334

Pr[Accept]: 0.503931624738915

Random Uniform: 0.354159296706951

Status: Accept

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Iteration: 99

Subset of features: Original

Accuracy: 0.9533333333333334

Pr[Accept]: 1.0

Random Uniform: 0.945057932887201

Status: Accept

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Accuracy:

0.9533333333333334

Confusion Matrix:

[[50 0 0]

[ 0 47 3]

[ 0 4 46]]

Features Used:

sepal-length sepal-width petal-length petal-width sepal-length-prime sepal-width-prime petal-length-prime petal-width-prime