Denzel Mathew

CIS4930

Individual\_Project\_II Report

**Titanic Dataset (Apriori)**

***All Rules***

Produces a set of 186 rules

***Support = 0.01 & Confidence = 0.9***

lhs rhs support confidence lift

1 {Class=2nd,Age=Child} => {Survived=Yes} 0.01090413 1.0000000 3.095640

2 {Class=1st,Sex=Female} => {Survived=Yes} 0.06406179 0.9724138 3.010243

3 {Class=2nd,Sex=Male,Age=Adult} => {Survived=No} 0.06996820 0.9166667 1.354083

4 {Class=1st,Sex=Female,Age=Adult} => {Survived=Yes} 0.06360745 0.9722222 3.009650

***Removing Redundancies***

1 {Class=2nd,Age=Child} => {Survived=Yes} 0.01090413 1.0000000 3.095640

2 {Class=1st,Sex=Female} => {Survived=Yes} 0.06406179 0.9724138 3.010243

3 {Class=2nd,Sex=Male,Age=Adult} => {Survived=No} 0.06996820 0.9166667 1.354083

***Sorted***

1 {Class=2nd,Age=Child} => {Survived=Yes} 0.01090413 1.0000000 3.095640

2 {Class=1st,Sex=Female} => {Survived=Yes} 0.06406179 0.9724138 3.010243

3 {Class=2nd,Sex=Male,Age=Adult} => {Survived=No} 0.06996820 0.9166667 1.354083

**Retail Dataset (Apriori)**

***All Rules***

Set of 6108 rules

***Support = 0.01 & Confidence = 0.9***

Set of 520 rules

\*\*1 - 500 omitted to save space \*\*

501 {Bread,CannedGoods,Dairy,Drink,Fruit,PaperGoods,Vegetable} => {PersonalCare} 0.0158 0.9518072 1.644165

502 {Bread,CannedGoods,Dairy,Drink,FrozenFood,Fruit,Vegetable} => {PersonalCare} 0.0314 0.9486405 1.638695

503 {Bread,Dairy,Drink,FrozenFood,Fruit,PaperGoods,Tobacco} => {PersonalCare} 0.0211 0.9590909 1.656747

504 {Bread,Dairy,Drink,FrozenFood,PaperGoods,Tobacco,Vegetable} => {PersonalCare} 0.0216 0.9642857 1.665721

505 {Dairy,Drink,FrozenFood,Fruit,PaperGoods,Tobacco,Vegetable} => {PersonalCare} 0.0232 0.9666667 1.669834

506 {Bread,Drink,FrozenFood,Fruit,PaperGoods,Tobacco,Vegetable} => {PersonalCare} 0.0303 0.9711538 1.677585

507 {Bread,Dairy,Drink,Fruit,PaperGoods,Tobacco,Vegetable} => {PersonalCare} 0.0408 0.9691211 1.674073

508 {Bread,Dairy,Drink,FrozenFood,Fruit,Tobacco,Vegetable} => {PersonalCare} 0.0459 0.9562500 1.651840

509 {Bread,Dairy,Drink,FrozenFood,Fruit,PaperGoods,Vegetable} => {PersonalCare} 0.0232 0.9626556 1.662905

510 {Bread,Cleaner,Drink,FrozenFood,Fruit,PaperGoods,Tobacco,Vegetable} => {PersonalCare} 0.0114 0.9579832 1.654834

511 {Bread,Cleaner,Dairy,Drink,Fruit,PaperGoods,Tobacco,Vegetable} => {PersonalCare} 0.0168 0.9655172 1.667848

512 {Bread,CannedGoods,Dairy,Drink,FrozenFood,Fruit,PaperGoods,Tobacco} => {PersonalCare} 0.0120 0.9448819 1.632202

513 {Bread,CannedGoods,Dairy,Drink,FrozenFood,PaperGoods,Tobacco,Vegetable} => {PersonalCare} 0.0124 0.9465649 1.635109

514 {CannedGoods,Dairy,Drink,FrozenFood,Fruit,PaperGoods,Tobacco,Vegetable} => {PersonalCare} 0.0130 0.9489051 1.639152

515 {Bread,CannedGoods,Drink,FrozenFood,Fruit,PaperGoods,Tobacco,Vegetable} => {PersonalCare} 0.0169 0.9602273 1.658710

516 {Bread,CannedGoods,Dairy,Drink,Fruit,PaperGoods,Tobacco,Vegetable} => {PersonalCare} 0.0123 0.9461538 1.634399

517 {Bread,CannedGoods,Dairy,Drink,FrozenFood,Fruit,Tobacco,Vegetable} => {PersonalCare} 0.0252 0.9473684 1.636498

518 {Bread,CannedGoods,Dairy,Drink,FrozenFood,Fruit,PaperGoods,Vegetable} => {PersonalCare} 0.0136 0.9444444 1.631447

519 {Bread,Dairy,Drink,FrozenFood,Fruit,PaperGoods,Tobacco,Vegetable} => {PersonalCare} 0.0191 0.9597990 1.657970

520 {Bread,CannedGoods,Dairy,Drink,FrozenFood,Fruit,PaperGoods,Tobacco,Vegetable} => {PersonalCare} 0.0108 0.9391304 1.622267

***Removing Redundancies***

lhs rhs support confidence lift

1 {Drink} => {PersonalCare} 0.2921 0.9675389 1.67134

***Sorted***

lhs rhs support confidence lift

1 {Drink} => {PersonalCare} 0.2921 0.9675389 1.67134

**Game of Thrones Dataset (Apriori)**

***All Rules***

Set of 475 rules

***Support = 0.01 & Confidence = 0.9***

Set of 83 rules

lhs rhs support confidence lift

1 {House=House Martell} => {Survives=1} 0.01199564 0.9166667 1.373502

2 {House=House Tyrell} => {Survives=1} 0.01090513 0.9090909 1.362151

3 {House=Tyrell} => {Survives=1} 0.01526718 0.9333333 1.398475

4 {House=Martell} => {Survives=1} 0.02508179 0.9200000 1.378497

5 {House=House Martell,Book4} => {Survives=1} 0.01199564 1.0000000 1.498366

6 {House=Targaryen,Book5} => {Survives=1} 0.01308615 0.9230769 1.383107

7 {House=Tyrell,Book4} => {Survives=1} 0.01308615 0.9230769 1.383107

8 {House=Tyrell,Nobility} => {Survives=1} 0.01526718 0.9333333 1.398475

9 {House=Arryn,Book4} => {Survives=1} 0.01635769 0.9375000 1.404718

10 {House=Arryn,Nobility} => {Survives=1} 0.01853871 0.9444444 1.415123

11 {House=Martell,Book3} => {Survives=1} 0.01526718 1.0000000 1.498366

12 {House=Martell,Nobility} => {Survives=1} 0.02071974 0.9500000 1.423448

13 {House=Greyjoy,Book4} => {Survives=1} 0.03925845 0.9230769 1.383107

14 {House=Stark,Gender=F} => {Survives=1} 0.02071974 0.9047619 1.355664

15 {House=Stark,Book5} => {Survives=1} 0.02944384 1.0000000 1.498366

16 {House=Lannister,Book4} => {Survives=1} 0.04252999 0.9285714 1.391340

17 {House=Lannister,Book5} => {Survives=1} 0.01199564 1.0000000 1.498366

18 {Gender=F,Book4} => {Survives=1} 0.05125409 0.9591837 1.437208

19 {Nobility,Book4} => {Survives=1} 0.14721919 0.9183673 1.376050

20 {House=Targaryen,Gender=M,Book5} => {Survives=1} 0.01199564 0.9166667 1.373502

21 {House=Tyrell,Nobility,Book4} => {Survives=1} 0.01308615 0.9230769 1.383107

22 {House=Arryn,Nobility,Book4} => {Survives=1} 0.01308615 1.0000000 1.498366

23 {House=Arryn,Gender=M,Book4} => {Survives=1} 0.01308615 0.9230769 1.383107

24 {House=Arryn,Gender=M,Nobility} => {Survives=1} 0.01635769 0.9375000 1.404718

25 {House=Martell,Nobility,Book3} => {Survives=1} 0.01308615 1.0000000 1.498366

26 {House=Martell,Gender=M,Book3} => {Survives=1} 0.01090513 1.0000000 1.498366

27 {House=Martell,Gender=M,Nobility} => {Survives=1} 0.01526718 0.9333333 1.398475

28 {House=Greyjoy,Nobility,Book4} => {Survives=1} 0.02944384 0.9310345 1.395030

29 {House=Greyjoy,Gender=M,Book4} => {Survives=1} 0.03489640 0.9142857 1.369935

30 {House=Stark,Gender=F,Book5} => {Survives=1} 0.01090513 1.0000000 1.498366

31 {House=Stark,Gender=F,Book3} => {Survives=1} 0.01090513 0.9090909 1.362151

32 {House=Stark,Nobility,Book5} => {Survives=1} 0.02835333 1.0000000 1.498366

33 {House=Stark,Gender=M,Book5} => {Survives=1} 0.01853871 1.0000000 1.498366

34 {House=Lannister,Book3,Book4} => {Survives=1} 0.02181025 0.9523810 1.427015

35 {House=Lannister,Nobility,Book4} => {Survives=1} 0.03707743 0.9189189 1.376877

36 {House=Lannister,Gender=M,Book4} => {Survives=1} 0.03707743 0.9444444 1.415123

37 {House=Lannister,Gender=M,Book5} => {Survives=1} 0.01090513 1.0000000 1.498366

38 {House=Night's Watch,Book1,Book5} => {Survives=1} 0.01308615 1.0000000 1.498366

39 {House=None,Gender=F,Nobility} => {Survives=1} 0.02181025 0.9523810 1.427015

40 {Gender=F,Book4,Book5} => {Survives=1} 0.01199564 1.0000000 1.498366

41 {Gender=F,Book2,Book4} => {Survives=1} 0.01090513 0.9090909 1.362151

42 {Gender=F,Book3,Book4} => {Survives=1} 0.02071974 1.0000000 1.498366

43 {Gender=F,Nobility,Book4} => {Survives=1} 0.03707743 0.9714286 1.455556

44 {Gender=F,Book3,Book5} => {Survives=1} 0.02071974 0.9500000 1.423448

45 {Gender=F,Nobility,Book5} => {Survives=1} 0.03162486 0.9666667 1.448420

46 {Book2,Book4,Book5} => {Survives=1} 0.02399128 0.9166667 1.373502

47 {Nobility,Book4,Book5} => {Survives=1} 0.02726281 0.9615385 1.440737

48 {Gender=M,Nobility,Book4} => {Survives=1} 0.11014177 0.9017857 1.351205

49 {Book1,Book3,Book5} => {Survives=1} 0.04034896 0.9024390 1.352184

50 {House=Arryn,Gender=M,Nobility,Book4} => {Survives=1} 0.01090513 1.0000000 1.498366

51 {House=Greyjoy,Gender=M,Nobility,Book4} => {Survives=1} 0.02726281 0.9259259 1.387376

52 {House=Stark,Gender=F,Nobility,Book5} => {Survives=1} 0.01090513 1.0000000 1.498366

53 {House=Stark,Gender=M,Nobility,Book5} => {Survives=1} 0.01744820 1.0000000 1.498366

54 {House=Lannister,Book2,Book3,Book4} => {Survives=1} 0.01635769 0.9375000 1.404718

55 {House=Lannister,Gender=M,Book2,Book4} => {Survives=1} 0.01962923 0.9000000 1.348529

56 {House=Lannister,Nobility,Book3,Book4} => {Survives=1} 0.01853871 0.9444444 1.415123

57 {House=Lannister,Gender=M,Book3,Book4} => {Survives=1} 0.01962923 0.9473684 1.419505

58 {House=Lannister,Gender=M,Nobility,Book4} => {Survives=1} 0.03162486 0.9354839 1.401697

59 {House=Lannister,Gender=M,Nobility,Book3} => {Survives=1} 0.02508179 0.9200000 1.378497

60 {House=Night's Watch,Book1,Book3,Book5} => {Survives=1} 0.01308615 1.0000000 1.498366

61 {House=Night's Watch,Gender=M,Book1,Book5} => {Survives=1} 0.01308615 1.0000000 1.498366

62 {House=None,Gender=F,Nobility,Book3} => {Survives=1} 0.01417666 0.9285714 1.391340

63 {Gender=F,Nobility,Book3,Book4} => {Survives=1} 0.01962923 1.0000000 1.498366

64 {Gender=F,Book2,Book3,Book5} => {Survives=1} 0.01308615 0.9230769 1.383107

65 {Gender=F,Nobility,Book3,Book5} => {Survives=1} 0.01199564 0.9166667 1.373502

66 {Nobility,Book1,Book4,Book5} => {Survives=1} 0.01090513 0.9090909 1.362151

67 {Nobility,Book2,Book4,Book5} => {Survives=1} 0.01744820 0.9411765 1.410227

68 {Nobility,Book3,Book4,Book5} => {Survives=1} 0.01417666 0.9285714 1.391340

69 {Gender=M,Nobility,Book4,Book5} => {Survives=1} 0.01744820 0.9411765 1.410227

70 {Nobility,Book2,Book3,Book4} => {Survives=1} 0.03598691 0.9166667 1.373502

71 {Gender=M,Book1,Book3,Book5} => {Survives=1} 0.03380589 0.9117647 1.366157

72 {House=Lannister,Nobility,Book2,Book3,Book4} => {Survives=1} 0.01308615 0.9230769 1.383107

73 {House=Lannister,Gender=M,Book2,Book3,Book4} => {Survives=1} 0.01635769 0.9375000 1.404718

74 {House=Lannister,Gender=M,Nobility,Book3,Book4} => {Survives=1} 0.01635769 0.9375000 1.404718

75 {House=Night's Watch,Gender=M,Book1,Book3,Book5} => {Survives=1} 0.01308615 1.0000000 1.498366

76 {Nobility,Book1,Book2,Book4,Book5} => {Survives=1} 0.01090513 0.9090909 1.362151

77 {Nobility,Book1,Book3,Book4,Book5} => {Survives=1} 0.01090513 0.9090909 1.362151

78 {Nobility,Book2,Book3,Book4,Book5} => {Survives=1} 0.01308615 0.9230769 1.383107

79 {Gender=M,Nobility,Book2,Book4,Book5} => {Survives=1} 0.01308615 0.9230769 1.383107

80 {Gender=M,Nobility,Book3,Book4,Book5} => {Survives=1} 0.01090513 0.9090909 1.362151

81 {Gender=M,Nobility,Book2,Book3,Book4} => {Survives=1} 0.02944384 0.9000000 1.348529

82 {House=Lannister,Gender=M,Nobility,Book2,Book3,Book4} => {Survives=1} 0.01308615 0.9230769 1.383107

83 {Nobility,Book1,Book2,Book3,Book4,Book5} => {Survives=1} 0.01090513 0.9090909 1.362151

***Removing Redundancies***

Set of 21 rules

lhs rhs support confidence lift

1 {House=House Martell} => {Survives=1} 0.01199564 0.9166667 1.373502

2 {House=House Tyrell} => {Survives=1} 0.01090513 0.9090909 1.362151

3 {House=Tyrell} => {Survives=1} 0.01526718 0.9333333 1.398475

4 {House=Martell} => {Survives=1} 0.02508179 0.9200000 1.378497

6 {House=Targaryen,Book5} => {Survives=1} 0.01308615 0.9230769 1.383107

9 {House=Arryn,Book4} => {Survives=1} 0.01635769 0.9375000 1.404718

10 {House=Arryn,Nobility} => {Survives=1} 0.01853871 0.9444444 1.415123

13 {House=Greyjoy,Book4} => {Survives=1} 0.03925845 0.9230769 1.383107

14 {House=Stark,Gender=F} => {Survives=1} 0.02071974 0.9047619 1.355664

15 {House=Stark,Book5} => {Survives=1} 0.02944384 1.0000000 1.498366

16 {House=Lannister,Book4} => {Survives=1} 0.04252999 0.9285714 1.391340

17 {House=Lannister,Book5} => {Survives=1} 0.01199564 1.0000000 1.498366

18 {Gender=F,Book4} => {Survives=1} 0.05125409 0.9591837 1.437208

19 {Nobility,Book4} => {Survives=1} 0.14721919 0.9183673 1.376050

38 {House=Night's Watch,Book1,Book5} => {Survives=1} 0.01308615 1.0000000 1.498366

39 {House=None,Gender=F,Nobility} => {Survives=1} 0.02181025 0.9523810 1.427015

44 {Gender=F,Book3,Book5} => {Survives=1} 0.02071974 0.9500000 1.423448

45 {Gender=F,Nobility,Book5} => {Survives=1} 0.03162486 0.9666667 1.448420

46 {Book2,Book4,Book5} => {Survives=1} 0.02399128 0.9166667 1.373502

49 {Book1,Book3,Book5} => {Survives=1} 0.04034896 0.9024390 1.352184

59 {House=Lannister,Gender=M,Nobility,Book3} => {Survives=1} 0.02508179 0.9200000 1.378497

***Sorted***

Set of 21 rules

lhs rhs support confidence lift

15 {House=Stark,Book5} => {Survives=1} 0.02944384 1.0000000 1.498366

17 {House=Lannister,Book5} => {Survives=1} 0.01199564 1.0000000 1.498366

38 {House=Night's Watch,Book1,Book5} => {Survives=1} 0.01308615 1.0000000 1.498366

45 {Gender=F,Nobility,Book5} => {Survives=1} 0.03162486 0.9666667 1.448420

18 {Gender=F,Book4} => {Survives=1} 0.05125409 0.9591837 1.437208

39 {House=None,Gender=F,Nobility} => {Survives=1} 0.02181025 0.9523810 1.427015

44 {Gender=F,Book3,Book5} => {Survives=1} 0.02071974 0.9500000 1.423448

10 {House=Arryn,Nobility} => {Survives=1} 0.01853871 0.9444444 1.415123

9 {House=Arryn,Book4} => {Survives=1} 0.01635769 0.9375000 1.404718

3 {House=Tyrell} => {Survives=1} 0.01526718 0.9333333 1.398475

16 {House=Lannister,Book4} => {Survives=1} 0.04252999 0.9285714 1.391340

6 {House=Targaryen,Book5} => {Survives=1} 0.01308615 0.9230769 1.383107

13 {House=Greyjoy,Book4} => {Survives=1} 0.03925845 0.9230769 1.383107

4 {House=Martell} => {Survives=1} 0.02508179 0.9200000 1.378497

59 {House=Lannister,Gender=M,Nobility,Book3} => {Survives=1} 0.02508179 0.9200000 1.378497

19 {Nobility,Book4} => {Survives=1} 0.14721919 0.9183673 1.376050

1 {House=House Martell} => {Survives=1} 0.01199564 0.9166667 1.373502

46 {Book2,Book4,Book5} => {Survives=1} 0.02399128 0.9166667 1.373502

2 {House=House Tyrell} => {Survives=1} 0.01090513 0.9090909 1.362151

14 {House=Stark,Gender=F} => {Survives=1} 0.02071974 0.9047619 1.355664

49 {Book1,Book3,Book5} => {Survives=1} 0.04034896 0.9024390 1.352184

Nobility does not play a role in survival as there are only 5 rules (23.8% chance) that account for nobility leading to survival. Gender also does not play a rule in survival as there are only 6 (28.5% chance) rules that account for gender leading to survival. No rules state that Jon Snow should not live as he is part of the Night’s Watch and is in Books 1-5. The rule {House=Night’s Watch, Book1, Book5} states that he survives with a high enough lift value. Arya Stark is of House Stark , a Female, exists in all the Books (1-5); the rules {House Stark, Book 5} and {House Stark, Gender = F} both apply to her and signifies that she does survive.