

# ECT\_HW2\_109403021\_第一題

## 1. 勾選屬性後按 remove 將其刪除

No.	Name
1	<input checked="" type="checkbox"/> year
2	<input checked="" type="checkbox"/> iso_code
3	<input checked="" type="checkbox"/> rank
4	<input type="checkbox"/> government_consumption
5	<input type="checkbox"/> transfers
6	<input type="checkbox"/> gov_enterprises
7	<input type="checkbox"/> top_marg_tax_rate
8	<input type="checkbox"/> size_government
9	<input type="checkbox"/> judicial_independence
10	<input type="checkbox"/> impartial_courts
11	<input type="checkbox"/> protection_property_rights
12	<input type="checkbox"/> military_interference
13	<input type="checkbox"/> integrity_legal_system
14	<input type="checkbox"/> legal_enforcement_contracts
15	<input type="checkbox"/> restrictions_sale_real_property
16	<input type="checkbox"/> reliability_police
17	<input type="checkbox"/> business_costs_crime
18	<input type="checkbox"/> gender_adjustment
19	<input type="checkbox"/> property_rights
20	<input type="checkbox"/> money_growth
21	<input type="checkbox"/> std_inflation
22	<input type="checkbox"/> inflation
23	<input type="checkbox"/> freedom_own_foreign_currency
24	<input type="checkbox"/> sound_money
25	<input type="checkbox"/> tariffs
26	<input type="checkbox"/> regulatory_trade_barriers
27	<input type="checkbox"/> black_market
28	<input type="checkbox"/> control_movement_capital_ppl
29	<input type="checkbox"/> trade
30	<input type="checkbox"/> credit_market_reg
31	<input type="checkbox"/> labor_market_reg

Remove

## 2. Filter 選到 ReplaceMissingValues 後按 apply 使用，把所有空值替代為該欄位平均數

Filter

Choose ReplaceMissingValues

### 前後對比範例(屬性 transfers):

Selected attribute	
Name: transfers	Type: Numeric
Missing: 115 (6%)	Unique: 976 (54%)
Distinct: 1162	
Statistic	Value
Minimum	1.94
Maximum	10
Mean	7.65
StdDev	2.099

Selected attribute	
Name: transfers	Type: Numeric
Missing: 0 (0%)	Unique: 976 (54%)
Distinct: 1163	
Statistic	Value
Minimum	1.94
Maximum	10
Mean	7.65
StdDev	2.031

3. Filter 選到 NumericToNominal，然後依據編號將 freedom 與 freedom\_own\_foreign\_currency 轉為 Nominal。

Filter
Choose NumericToNominal -R 20,31

Numeric 無法使用在 Decision tree 是因為 numeric 在 decision tree 會過於容易分類成不同類別。所以把 freedom 與 freedom\_own\_foreign\_currency 轉為 Nominal，因為它們的性質本就是用數字表示 nominal 不適合用區間分類，其他 numeric 屬性則以分成區間的方式使用在 decision tree

前後對比:

前:

Selected attribute		
Name: freedom_own_foreign_currency		Type: Numeric
Missing: 0 (0%)	Distinct: 3	Unique: 0 (0%)
Statistic	Value	
Minimum	0	
Maximum	2	
Mean	1.322	
StdDev	0.824	

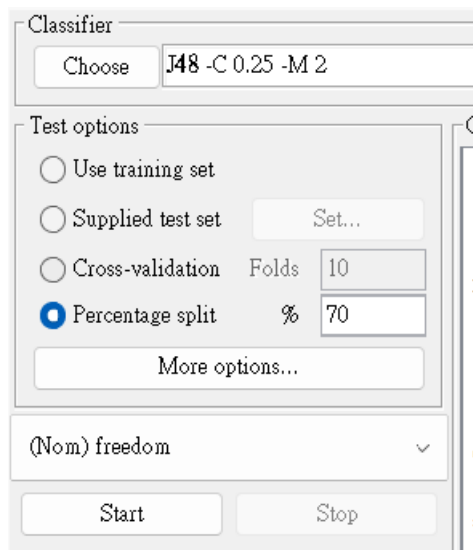
Selected attribute		
Name: freedom		Type: Numeric
Missing: 0 (0%)	Distinct: 2	Unique: 0 (0%)
Statistic	Value	
Minimum	0	
Maximum	1	
Mean	0.814	
StdDev	0.389	

後:

Selected attribute			
Name: freedom_own_foreign_currency			Type: Nominal
Missing: 0 (0%)		Distinct: 3	Unique: 0 (0%)
No.	Label	Count	Weight
1	0	414	414
2	1	393	393
3	2	994	994

Selected attribute			
Name: freedom			Type: Nominal
Missing: 0 (0%)		Distinct: 2	Unique: 0 (0%)
No.	Label	Count	Weight
1	0	335	335
2	1	1466	1466

4. Classifier 選到 J48、Test options 選到 Percentage split 並填入 70%後按 Start 得出結果



分類準確率:

```
=== Summary ===
```

Correctly Classified Instances	515	95.3704 %
Incorrectly Classified Instances	25	4.6296 %
Kappa statistic	0.8296	
Mean absolute error	0.0489	
Root mean squared error	0.211	
Relative absolute error	16.4357 %	
Root relative squared error	56.021 %	
Total Number of Instances	540	

混淆矩陣:

```
=== Confusion Matrix ===
```

```
 a   b   <-- classified as
75  17 |   a = 0
 8 440 |   b = 1
```

### Decision tree:

