

音樂資訊檢索 HW1

Q1

Accuracy:

GTZAN	GiantSteps
<pre>***** Q1 ***** Genre accuracy blues 7.14% country 32.32% disco 31.63% hiphop 13.58% jazz 16.46% metal 24.73% pop 41.49% reggae 32.99% rock 34.69% ----- Overall accuracy: 26.52%</pre>	<pre>***** Q1 ***** giantsteps Overall accuracy: 22.35%</pre>

Discussion:

藍調(blues) 的準確率最低。或許因為是原始藍調的特色，就是在大調音階上，以 Bb, Eb 取代 B, E(資料來源: [http://tx.liberal.ntu.edu.tw/TxMusic/Docs/Audio-Harmony Blues.htm](http://tx.liberal.ntu.edu.tw/TxMusic/Docs/Audio-Harmony%20Blues.htm))，這樣的調性修改，造成 match template 時產生誤差，比如 match 不到，或被當成小調。

Q2

Accuracy:

GTZAN	
$\gamma = 1$	$\gamma = 10$
<pre>***** Q2 ***** GTZAN 1 Genre accuracy blues 10.20% country 32.32% disco 31.63% hiphop 13.58% jazz 16.46% metal 24.73% pop 41.49% reggae 32.99% rock 34.69% ----- Overall accuracy: 26.88%</pre>	<pre>***** Q2 ***** GTZAN γ = 10 Genre accuracy blues 10.20% country 32.32% disco 31.63% hiphop 13.58% jazz 16.46% metal 24.73% pop 41.49% reggae 32.99% rock 34.69% ----- Overall accuracy: 26.88%</pre>
$\gamma = 100$	$\gamma = 1000$
<pre>***** Q2 ***** GTZAN γ = 100 Genre accuracy blues 10.20% country 32.32% disco 31.63% hiphop 13.58% jazz 16.46% metal 24.73% pop 41.49% reggae 32.99% rock 34.69% ----- Overall accuracy: 26.88%</pre>	<pre>***** Q2 ***** GTZAN γ = 1000 Genre accuracy blues 10.20% country 32.32% disco 31.63% hiphop 13.58% jazz 16.46% metal 24.73% pop 41.49% reggae 32.99% rock 34.69% ----- Overall accuracy: 26.88%</pre>

GiantSteps	
$\gamma = 1$	$\gamma = 10$
<pre>***** Q2 ***** giantsteps $\gamma = 1$ Overall accuracy: 23.68%</pre>	<pre>***** Q2 ***** giantsteps $\gamma = 10$ Overall accuracy: 23.68%</pre>
$\gamma = 100$	$\gamma = 1000$
<pre>***** Q2 ***** giantsteps $\gamma = 100$ Overall accuracy: 23.68%</pre>	<pre>***** Q2 ***** giantsteps $\gamma = 1000$ Overall accuracy: 23.68%</pre>

Discussion:

實作之後，可以發現兩個資料庫的準確率都有些許提升。在 GTZAN 中，只有藍調準確率有所提升，其餘曲風無明顯變化。

單就 γ 的值來看，其大小和準確率似乎沒有明顯的相關性，無論 γ 值增加多少都無法進一步提升準確率。

Q3

Accuracy:

GTZAN	GiantSteps
<pre>***** Q3 ***** GTZAN Genre accuracy blues 18.57% country 33.64% disco 34.69% hiphop 18.40% jazz 22.41% metal 30.54% pop 45.43% reggae 35.46% rock 41.12% ----- Overall accuracy: 31.53%</pre>	<pre>***** Q3 ***** giantsteps Overall accuracy: 28.25%</pre>

Discussion:

由於此方法和 Q1 基本相同，且因為在此方法下，即使預測的答案和 **ground truth** 不一樣，仍能得到部分的分數，所以大部分類別的準確率都有所提升。比較值得注意的是原本準確率最低的藍調，在調整之後的準確率有較大幅度的提升。

Q4

Q1

Accuracy:

GTZAN	GiantSteps
<pre>***** Q4 ***** GTZAN Genre accuracy blues 19.39% country 49.49% disco 34.69% hiphop 18.52% jazz 29.11% metal 34.41% pop 58.51% reggae 57.73% rock 42.86% ----- Overall accuracy: 38.83%</pre>	<pre>***** Q4 ***** giantsteps Overall accuracy: 38.08%</pre>

Discussion:

與原始 Q1 相比，有較明顯的提升，disco 最不明顯

Q2

Accuracy:

GTZAN	
$\gamma = 1$	$\gamma = 10$
<pre>***** Q4 ***** GTZAN Genre accuracy blues 22.45% country 49.49% disco 36.73% hiphop 20.99% jazz 32.91% metal 33.33% pop 54.26% reggae 57.73% rock 39.80% ----- Overall accuracy: 39.07%</pre>	<pre>GTZAN γ = 10 Genre accuracy blues 22.45% country 49.49% disco 36.73% hiphop 20.99% jazz 32.91% metal 33.33% pop 54.26% reggae 57.73% rock 39.80% ----- Overall accuracy: 39.07%</pre>
$\gamma = 100$	$\gamma = 1000$
<pre>***** Q4 ***** GTZAN γ = 100 Genre accuracy blues 22.45% country 49.49% disco 36.73% hiphop 20.99% jazz 32.91% metal 33.33% pop 54.26% reggae 57.73% rock 39.80% ----- Overall accuracy: 39.07%</pre>	<pre>***** Q4 ***** GTZAN γ = 1000 Genre accuracy blues 22.45% country 49.49% disco 36.73% hiphop 20.99% jazz 32.91% metal 33.33% pop 54.26% reggae 57.73% rock 39.80% ----- Overall accuracy: 39.07%</pre>

GiantSteps	
$\gamma = 1$	$\gamma = 10$
<pre>***** Q4 ***** giantsteps $\gamma = 1$ Overall accuracy: 39.40%</pre>	<pre>***** Q4 ***** giantsteps $\gamma = 10$ Overall accuracy: 39.40%</pre>
$\gamma = 100$	$\gamma = 1000$
<pre>***** Q4 ***** giantsteps $\gamma = 100$ Overall accuracy: 39.40%</pre>	<pre>***** Q4 ***** giantsteps $\gamma = 1000$ Overall accuracy: 39.40%</pre>

Discussion:

和 Q2 得出之結論相同，取 \log 能提升些許準確率，在 GTZAN 依舊只有藍調提升，而整體準確率與 γ 大小沒有太大關係。

Q3

Accuracy:

GTZAN	GiantSteps
<pre>***** Q4 ***** GTZAN Genre accuracy blues 29.49% country 51.41% disco 42.04% hiphop 24.44% jazz 35.57% metal 41.40% pop 62.02% reggae 59.07% rock 47.65% ----- Overall accuracy: 44.17%</pre>	<pre>***** Q4 ***** giantsteps Overall accuracy: 42.68%</pre>

Discussion:

Q3 準確率是裡面最高的。

綜合來看，這個方法的準確率是目前最好的，可能的原因是因為他跟 24 個 template 都有比到。而之前先找主音的作法如果主音找錯就萬事休矣。

Q5

Accuracy:

BPS-FH	
Binary template	
原始 ACC	加權 ACC
----- accuracy: 16.67%	----- accuracy: 27.23%
K-S	
原始 ACC	加權 ACC
----- accuracy: 17.21%	----- accuracy: 25.75%
A-MAPS	
Binary template	
原始 ACC	加權 ACC
----- accuracy: 10.31%	----- accuracy: 18.86%
K-S	
原始 ACC	加權 ACC
----- accuracy: 10.86%	----- accuracy: 15.68%

Discussion:

在這兩個資料集中，無論是哪種方法準確率都不高，就算以加權過後的準確率來看也遠比 Q1~Q4 得到之準確率低，推測可能是因為這樣的判斷方法需要從較少的資料推斷結果，因此較不容易正確的判斷。