多媒體

Mini project 2-2 改

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一、 模擬程式：

基於上次得音高的 pitch()函式，我這次做了幾點改進，讓輸出的結果正確且完整。首先，我發現上次會出現錯誤音高除了聲音雜訊影響之外，取樣數太少也是原因，故我將取樣個數翻倍成 2048 個，也提高 frameinterval 以減少程式運算時間:

```
//設定並輸出spectrogram of Set2
gen_spectrogram(1, 0.04, 0.04644, 0.04, 44100, name, "test1.txt",labname,T);
```

再來，我也讓時間定義成 double，讓音高開始與結束時間更加精準:

```
test = pitch(F);
if(strcmp(test,v1) != 0){   //字串比較用法
    t_e = (double)(i*FrameInterval+2*(double)nu/(double)fs);  //test音高開始的時間
    fprintf(lab,"%.7f %.7f %s\n",t_s,t_e,v1);
    t_s = t_e;
    strncpy(v1,test,4);
}
```

而最後，為了讓三個 wav 音檔有相同名稱的 lab 檔輸出，我做了以下的改變:

```
char* name = argv[1];
char* labname = malloc(50);
int T;

if(name[0] == 'P'){
    strcpy(labname,"Prelude_No._1_in_C_Major_BWV_846_for_Flute.lab");
    T =  15;
}
else if(name[0] == 'B'){
    strcpy(labname,"Badinerie_for_flute_by_JS_Bach.lab");
    T = 16;
}
else{
    strcpy(labname,"FamilyMart-Right-Channel.lab");
    T = 8;
}
```

修正瑕疵的地方後，搭配上次完成的 pitch()函式，即可正確輸出個時間點音高。

二、 輸出結果:

Family:

Before:

mini project 2-2 > 1.lab

```
0.0000000 0.4700000 non
0.4700000 0.4800000 A6
0.4800000 0.8500000 G5
0.8500000 0.8600000 F5#
0.8600000 1.2300000 D5
1.2300000 1.5900000 A4
1.5900000 1.9600000 D5
1.9600000 2.3300000 F5
2.3300000 3.4300000 A5
3.4300000 3.8000000 F5
3.8000000 3.8100000 F5#
3.8100000 4.1700000 G5
4.1700000 4.5400000 F5
4.5400000 4.9100000 A4
4.9100000 6.9900000 D5
```

After:

mini project 2-2 > FamilyMart-Right-Channel.lab

```
0.0000000 0.4815873 non
0.4815873 0.8812698 F5#
0.8812698 1.2409524 D5
1.2409524 1.6012698 A4
1.6012698 1.9614059 D5
1.9614059 2.3219048 E5
2.3219048 3.4414059 A5
3.4414059 3.8015873 E5
3.8015873 4.1614059 F5#
4.1614059 4.5609524 E5
4.5609524 4.9212698 A4
4.9212698 7.1600000 D5
```

Prelude:

Before:

```
0.0000000 0.0000000 non
0.0000000 0.0100000 E7
0.0100000 0.2700000 C5
0.2700000 0.2800000 G6
0.2800000 0.5200000 E5
0.5200000 0.5700000 G5
0.5700000 0.6000000 G6
0.6000000 0.6200000 G5
0.6200000 0.7500000 G6
0.7500000 1.0100000 C6
1.0100000 1.2300000 E6
1.2300000 1.2700000 G5
1.2700000 1.3100000 G6
1.3100000 1.3300000 G5
1.3300000 1.4500000 G6
1.4500000 1.7200000 C6
```

After:

mini project 2-2 > Prelude_No._1_in_C_Major_BWV_846_for_Flute.lab

```
1    0.0000000 0.0010884 non
2    0.0010884 0.2814059 C5
3    0.2814059 0.5216327 E5
4    0.5216327 0.7622222 G5
5    0.7622222 1.0028118 C6
6    1.0028118 1.2416327 E6
7    1.2416327 1.4422222 G5
8    1.4422222 1.7227664 C6
9    1.7227664 1.9610884 E6
10   1.9610884 2.1614059 C5
11   2.1614059 2.4016327 E5
12   2.4016327 2.6422222 G5
13   2.6422222 2.8828118 C6
14   2.8828118 3.1216327 E6
15   3.1216327 3.3222222 G5
16   3.3222222 3.6027664 C6
17   3.6027664 3.8010884 E6
18   3.8010884 4.0033107 C5
19   4.0033107 4.0412245 G5
20   4.0412245 4.2837188 D5
21   4.2837188 4.5224943 A5
22   4.5224943 4.7629478 D6
23   4.7629478 5.0037188 F6
```

Badinerie:

Before:

```
0.0000000 0.0100000 non
0.0100000 0.3400000 B5
0.3400000 0.4300000 D6
0.4300000 0.5500000 B5
0.5500000 0.8000000 F5#
0.8000000 0.9300000 B5
0.9300000 1.0700000 F5#
1.0700000 1.3100000 D5
1.3100000 1.4300000 F5#
1.4300000 1.5500000 D5
1.5500000 1.9700000 A4#
1.9700000 2.0000000 C5
```

After:

mini project 2-2 > Badinerie_for_flute_by_JS_Bach.lab

```
1   0.0000000 0.0020862 non
2   0.0020862 0.3224943 B5
3   0.3224943 0.4420862 D6
4   0.4420862 0.5615420 B5
5   0.5615420 0.8020862 F5#
6   0.8020862 0.9215420 B5
7   0.9215420 1.0812245 F5#
8   1.0812245 1.3215420 D5
9   1.3215420 1.4412245 F5#
10  1.4412245 1.5610431 D5
11  1.5610431 2.0807710 B4
12  2.0807710 2.1610431 F4#
13  2.1610431 2.3212245 B4
14  2.3212245 2.4410431 D5
15  2.4410431 2.5611791 B4
16  2.5611791 2.6810431 C5#
17  2.6810431 2.8011791 B4
18  2.8011791 2.9210431 C5#
19  2.9210431 3.0409977 B4
20  3.0409977 3.2011791 A4#
```