CS209 – LAB7

Key Content

- Learn the workflow of data processing using Stream.

- Understand the performance difference among Stream, Primitive stream specializations and Collection.

- Comprehensively apply the common operations of Stream to solve problems.

Before Exercise

1. Let's review the question of Lab5 exercise:

Given an integer array, please output all even numbers in the array.

We should use the following code:

```
Predicate<Integer> isOdd = (e) -> e % 2 != 0;
arrayList.removeIf(isOdd);
```

How can we do the same thing using Stream?

(1) Producing Stream:

```
arrayList.stream()
```

(2) Transform Stream:

```
arrayList.stream().filter(isEven)
```

(3) Collecting Stream:

If we want to get the result List:
```
List<Integer> res = arrayList.stream().filter(isEven).collect(Collectors.toList());
```

Or just want to print the result:

```
arrayList.stream().filter(isEven).forEach(System.out::println);
```

2. Performance Test:

(1) Download reference code **StreamPerformanceTest.java** from sakai.

(2) Change the variable n from 10 to 100, 1000,…and so on.

```
int n = 10;
```

(3) Observe the results when the n change to different value.

Exercise

Read a output file of Assignment1, the file name pass to the program as args[0], and do the following tasks:

(1) Sort by the count and output the top 20 characters.

Sample Run:

>java Exercise7 流浪地球_gb18030_char.txt 1

Sample Output:

```
的，B5C4，1057
一，D2BB，424
我，CED2，378
了，C1CB，373
在，D4DA，364
地，B5D8，347
们，C3C7，280
这，D5E2，247
是，CAC7，245
个，B8F6，224
球，C7F2，216
到，B5BD，207
中，D6D0，188
上，C9CF，186
有，D3D0，179
人，C8CB，174
时，CAB1，170
那，C4C7，159
星，D0C7，156
不，B2BB，155
```

(2) Calculate the sum of all the count of characters.

Sample Input:

>java Exercise7 流浪地球_gb18030_char.txt 2

Sample Output:

20421

(3) Output the count of lines.

Sample Input:
>java Exercise7 流浪地球_gb18030_char.txt 3
Sample Output:
1549

(4) Output the character which has the max count.

Sample Input:
>java Exercise7 流浪地球_gb18030_char.txt 4
Sample Output:
的

(5) Do not see the reference code of Assignment1, rewrite the assignment1 using Stream.