作业五

一、设计思路：

1.开发环境与工具：

> 基于vscode，安装Java开发插件和Maven插件，借助maven在vscode上搭建hadoop开发环境

2.编写MapReduce程序：

> - 读取输入文件A和B，将它们作为输入数据。
> - 编写Mapper阶段，Mapper的任务是将输入数据按照指数编号和成分股代码进行映射，然后输出（指数编号，成分股代码）作为键值对。
> - 编写Reducer阶段，Reducer的任务是接收Mapper输出的键值对，并在Reducer内部进行数据合并和去重操作。
> - 最后，Reducer将合并后的数据写入输出文件。

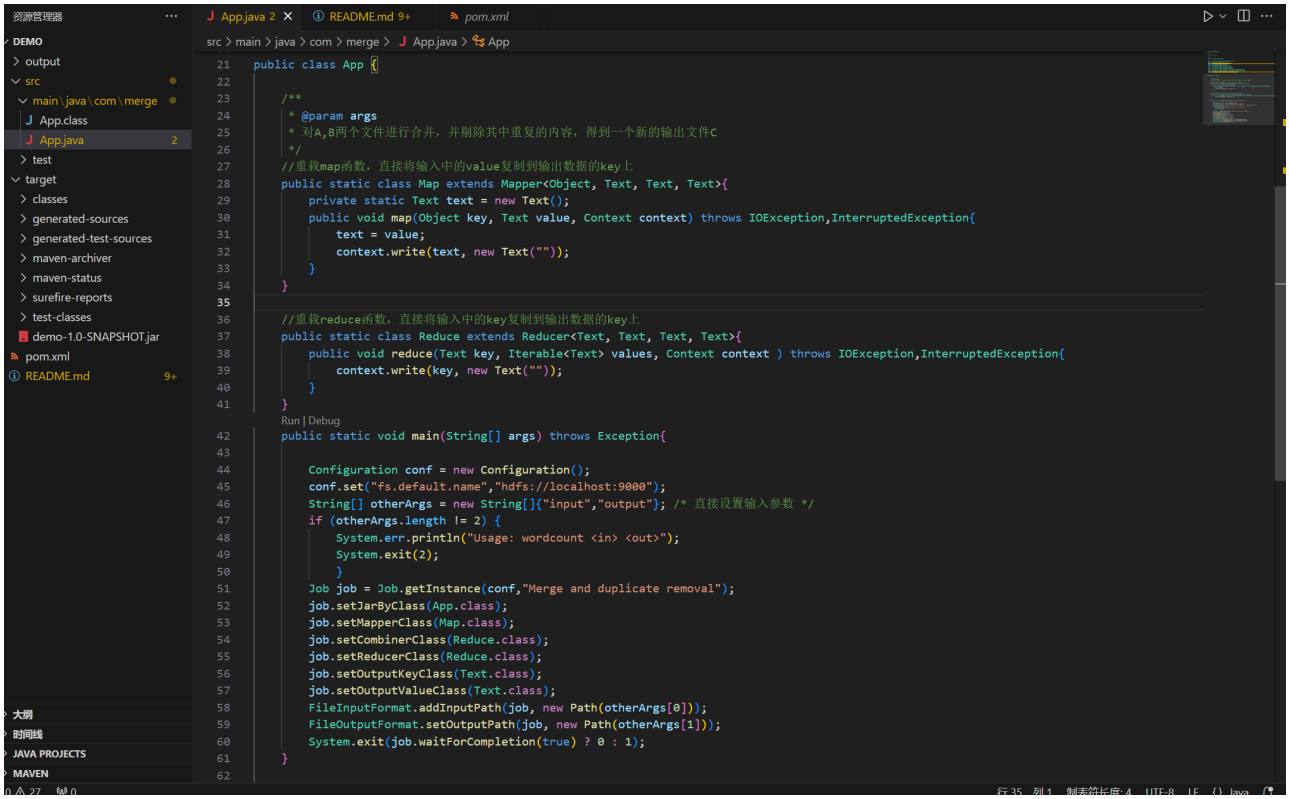
3.运行MapReduce程序： 使用Hadoop集群来运行MapReduce程序，指定输入文件A和B以及输出文件的路径。

二、程序运行结果说明：

1. **在vscode上新建Maven项目，并在pom.xml文件中新增有关hadoop的相关依赖配置**

```xml
<dependencies>
  <dependency>
    <groupId>junit</groupId>
    <artifactId>junit</artifactId>
    <version>4.11</version>
    <scope>test</scope>
  </dependency>

  <dependency>
      <groupId>org.apache.hadoop</groupId>
      <artifactId>hadoop-common</artifactId>
      <version>3.3.6</version>
  </dependency>

  <dependency>
      <groupId>org.apache.hadoop</groupId>
      <artifactId>hadoop-hdfs</artifactId>
      <version>3.3.6</version>
  </dependency>

  <dependency>
      <groupId>org.apache.hadoop</groupId>
      <artifactId>hadoop-client</artifactId>
      <version>3.3.6</version>
  </dependency>

  <dependency>
      <groupId>org.apache.hadoop</groupId>
      <artifactId>hadoop-yarn-api</artifactId>
      <version>3.3.6</version>
  </dependency>
```

2. **编译源代码，实现MapReduce的合并去重思想**



3. **导出jar文件，将程序复制到本地Hadoop系统的执行目录，在伪分布式环境下进行测试**

```
# user @ ubuntu in /hadoop_installs/hadoop-3.3.6 [17:35:29] C:1
$ bin/hdfs dfs -mkdir /user/user/input

# user @ ubuntu in /hadoop_installs/hadoop-3.3.6 [17:35:38]
$ bin/hdfs dfs -put A.csv input

# user @ ubuntu in /hadoop_installs/hadoop-3.3.6 [17:35:56]
$ bin/hdfs dfs -put B.csv input

# user @ ubuntu in /hadoop_installs/hadoop-3.3.6 [17:36:03]
$ bin/hadoop jar example-hjy/demo/target/demo-1.0-SNAPSHOT.jar com.merge.App input output
2023-10-22 17:36:16,433 INFO Configuration.deprecation: fs.default.name is deprecated. Instead, use fs.defaultFS
2023-10-22 17:36:17,055 INFO client.DefaultNoHARMFailoverProxyProvider: Connecting to ResourceManager at /0.0.0.0:8032
2023-10-22 17:36:17,413 WARN mapreduce.JobResourceUploader: Hadoop command-line option parsing not performed. Implement the Tool inte
rface and execute your application with ToolRunner to remedy this.
2023-10-22 17:36:17,430 INFO mapreduce.JobResourceUploader: Disabling Erasure Coding for path: /tmp/hadoop-yarn/staging/user/.staging
/job_1697963916839_0006
2023-10-22 17:36:17,668 INFO input.FileInputFormat: Total input files to process : 2
2023-10-22 17:36:17,729 INFO mapreduce.JobSubmitter: number of splits:2
2023-10-22 17:36:17,761 INFO Configuration.deprecation: fs.default.name is deprecated. Instead, use fs.defaultFS
2023-10-22 17:36:17,870 INFO mapreduce.JobSubmitter: Submitting tokens for job: job_1697963916839_0006
2023-10-22 17:36:17,870 INFO mapreduce.JobSubmitter: Executing with tokens: []
2023-10-22 17:36:18,029 INFO conf.Configuration: resource-types.xml not found
2023-10-22 17:36:18,029 INFO resource.ResourceUtils: Unable to find 'resource-types.xml'.
2023-10-22 17:36:18,113 INFO impl.YarnClientImpl: Submitted application application_1697963916839_0006
2023-10-22 17:36:18,162 INFO mapreduce.Job: The url to track the job: http://ubuntu:8088/proxy/application_1697963916839_0006/
2023-10-22 17:36:18,163 INFO mapreduce.Job: Running job: job_1697963916839_0006
2023-10-22 17:36:24,258 INFO mapreduce.Job: Job job_1697963916839_0006 running in uber mode : false
2023-10-22 17:36:24,259 INFO mapreduce.Job:  map 0% reduce 0%
2023-10-22 17:36:29,352 INFO mapreduce.Job:  map 50% reduce 0%
2023-10-22 17:36:33,385 INFO mapreduce.Job:  map 100% reduce 0%
2023-10-22 17:36:36,403 INFO mapreduce.Job:  map 100% reduce 100%
2023-10-22 17:36:37,413 INFO mapreduce.Job: Job job_1697963916839_0006 completed successfully
2023-10-22 17:36:37,502 INFO mapreduce.Job: Counters: 54
   File System Counters
        FILE: Number of bytes read=6773
        FILE: Number of bytes written=842766
        FILE: Number of read operations=0
```

三、运行成功的WEB页面截图：

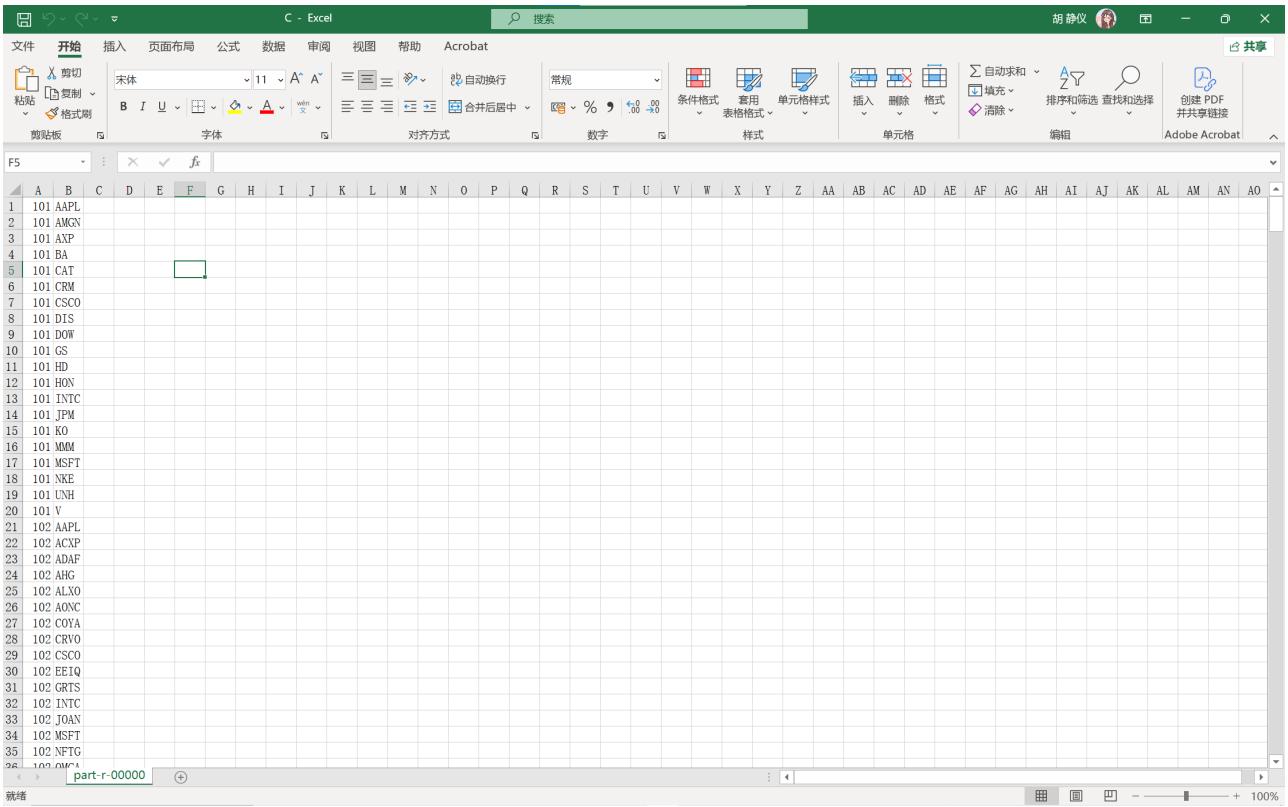
1. **part-r-00000和_SUCCESS截图**

part-r-00000 - 记事本

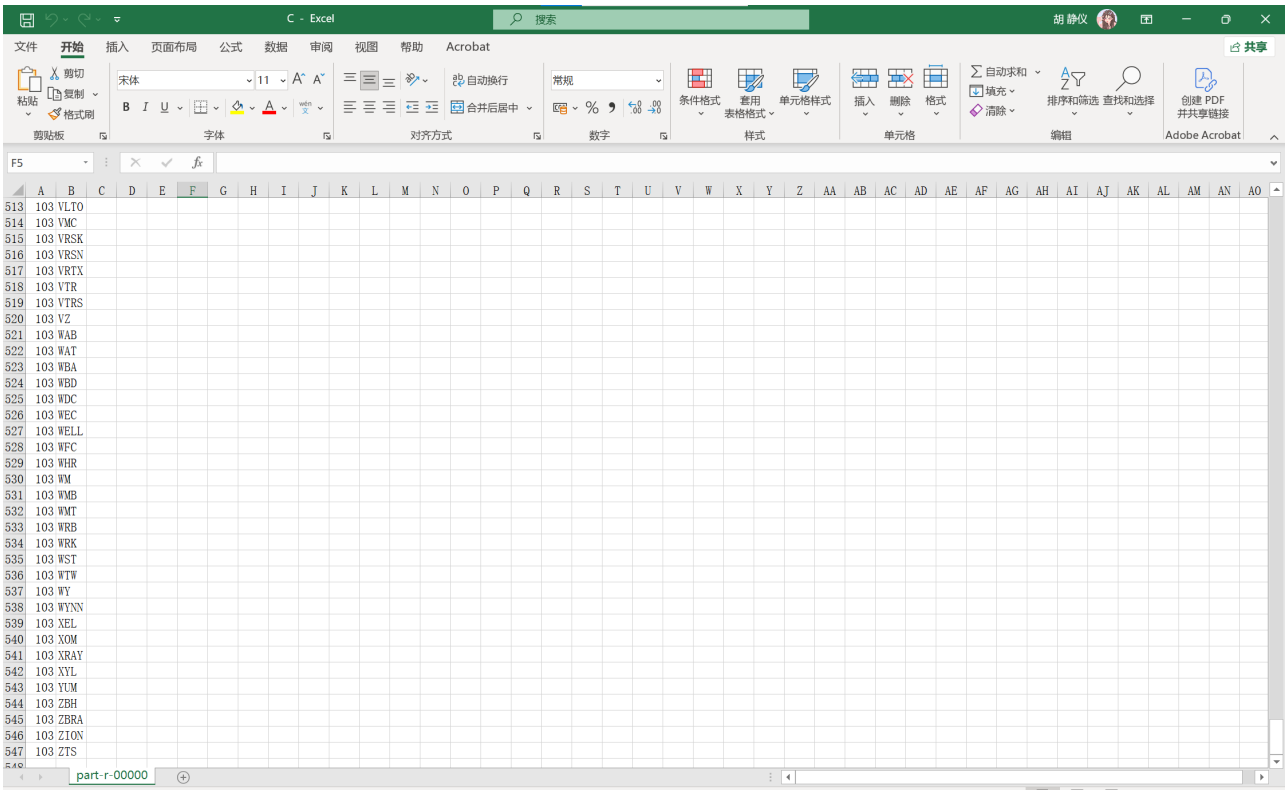
文件(F) 编辑(E) 格式(O) 查看(V) 帮助(H)

```
101,AAPL
101,AMGN
101,AXP
101,BA
101,CAT
101,CRM
101,CSCO
101,DIS
101,DOW
101,GS
101,HD
101,HON
101,INTC
101,JPM
101,KO
101,MMM
101,MSFT
101,NKE
101,UNH
101,V
102,AAPL
102,ACXP
102,ADAF
102,AHG
102,ALXO
102,AONC
102,COYA
102,CRVO
102,CSCO
102,EEIQ
102,GRTS
102,INTC
102,JOAN
102,MSFT
102,NFTG
102,OMGA
102,ORGS
102,PRZO
102,SBFM
102,TSBX
```

2. **C.xlsx截图**



	A	B
1	101	AAPL
2	101	AMGN
3	101	AXP
4	101	BA
5	101	CAT
6	101	CRM
7	101	CSCO
8	101	DIS
9	101	DOW
10	101	GS
11	101	HD
12	101	HON
13	101	INTC
14	101	JPM
15	101	KO
16	101	MMM
17	101	MSFT
18	101	NKE
19	101	UNH
20	101	V
21	102	AAPL
22	102	ACXP
23	102	ADAF
24	102	AHG
25	102	ALXO
26	102	AONC
27	102	COYA
28	102	CRVO
29	102	CSCO
30	102	EEIQ
31	102	GRTS
32	102	INTC
33	102	JOAN
34	102	MSFT
35	102	NFTG


C - Excel
搜索
胡 静仪
文件 开始 插入 页面布局 公式 数据 审阅 视图 帮助 Acrobat
共享
粘贴 剪切 复制 格式刷
宋体 11
自动换行
常规
合并后居中
条件格式 套用表格格式 单元格样式
插入 删除 格式
自动求和 填充 清除
排序和筛选 查找和选择
创建 PDF 并共享链接
剪贴板 字体 对齐方式 数字 样式 单元格 编辑 Adobe Acrobat
F5
513 103 VLTO
514 103 VMC
515 103 VRSK
516 103 VRSN
517 103 VRTX
518 103 VTR
519 103 VTRS
520 103 VZ
521 103 WAB
522 103 WAT
523 103 WBA
524 103 WBD
525 103 WDC
526 103 WEC
527 103 WELL
528 103 WFC
529 103 WHR
530 103 WM
531 103 WMB
532 103 WMT
533 103 WRB
534 103 WRK
535 103 WST
536 103 WTW
537 103 WY
538 103 WYNN
539 103 XEL
540 103 XOM
541 103 XRAY
542 103 XYL
543 103 YUM
544 103 ZBH
545 103 ZBRA
546 103 ZION
547 103 ZTS
part-r-00000