第五章 德塔数据结构变量快速转换

德塔数据结构变量快速转换引擎系统说明书 1.0

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1. 起源动机

作者2008印度基督大学编写c数据结构论文第一次涉及计算Meta Type的格式研究。
作者2015年美国亚米，为公司研发过基于Redis 的 List<String[]> 与String的互换函数。
作者2016年美国走四方，为公司研发过基于第三方的xml端和json端的2种不同request进行统一的5个互换函数(XmlToJsonObject, JsonObjectToMap, MapToJsonString, XmlToMap MapToXml)，感觉数据变换是一个趋势主题。
作者2018年在为父亲做股市分析软件的时候，从互联网16个不同的网站抓取各种股市数据进行处理，第一次认为有必要自己开始动手写一个完整的系统包的需求。
2019年8月11日 开始正式确立这个研发计划。为了满足数据内部快速统一与未知数据预处理功能。

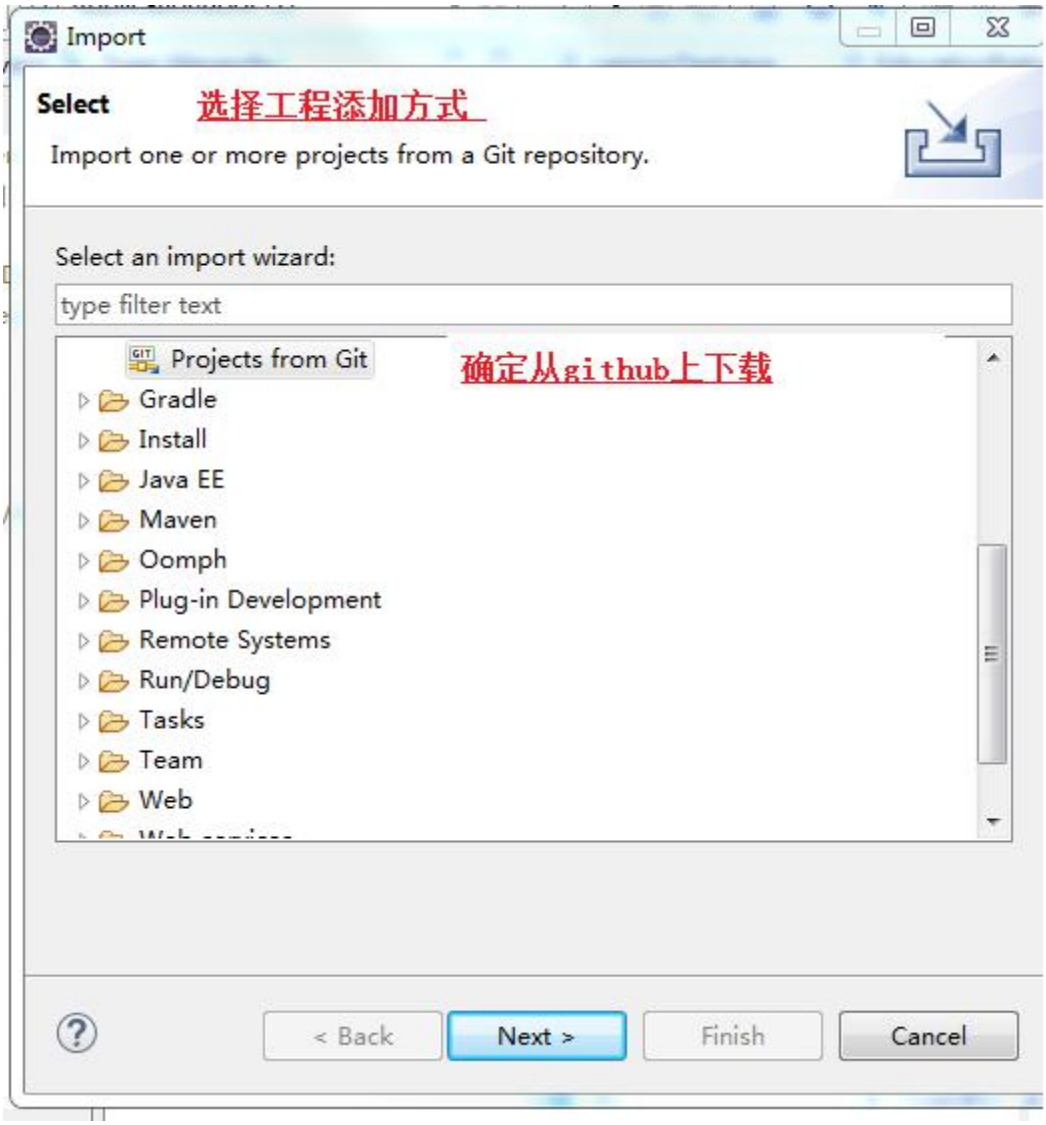
2. 简介

德塔数据结构变量快速转换引擎系统，由变换函数集合组成，他的作用是有效的将目前世界上所有出现的基础结构和主流基础数据封装类型进行正确的有效变换，方便大数据智能系统对抽象的，复杂的，不可观测的对象进行快速统一，保证计算的高准确性和低失真率。是数据领域永久主题，同时也是德塔大数据研发的基础保障。

3 使用方法

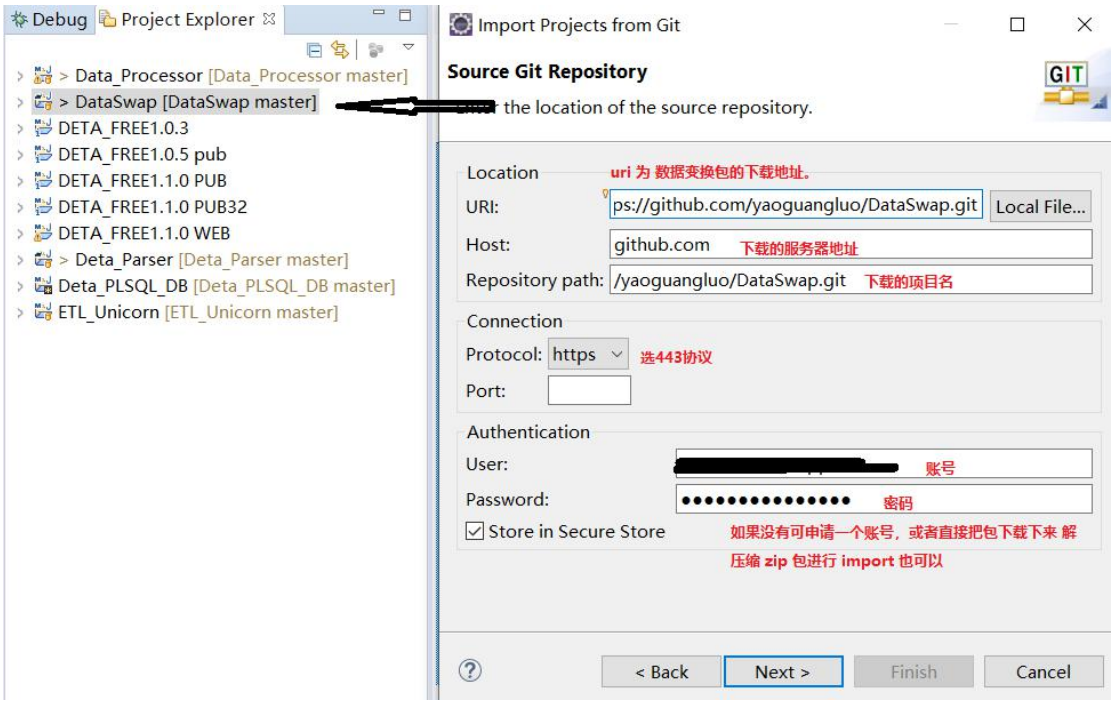
3.1下载 java 开发软件:
Eclipse: https://www.eclipse.org/
Intellij: https://www.jetbrains.com/idea/

3.2 导入 deta swap api (swap是交换的意思，API 是类库,接口 的意思, select 是选择 的意思)

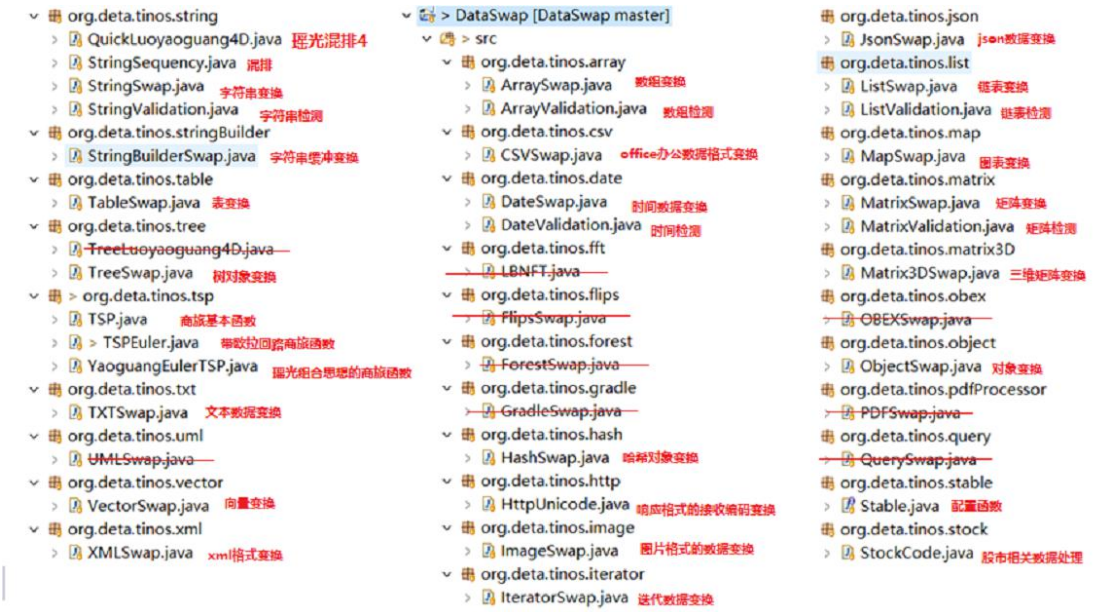


3.3 点URI (uri是互联网传输的一种协议规范关键字)

3.4输入 Git导入目标地址 (git是版本持续化控制软件, repository 是 git工程的下载标识, host 是远程主机, repository path 是git工程 在主机上下载链接, protocol 是是通信协议, port是端口, authentication是密钥, user是帐户名, password是密码, store in secure store 是记录保存)



3.5 生成 eclipse 工程 因为是无插件底层源码, 所以可以自由集成为pom, gradle, web,或者general 工程模式. (POM 是xml形式的库标识 标识, gradle 是 模板形式, web 是web 2.0 动态java工程， general 是普通java工程)

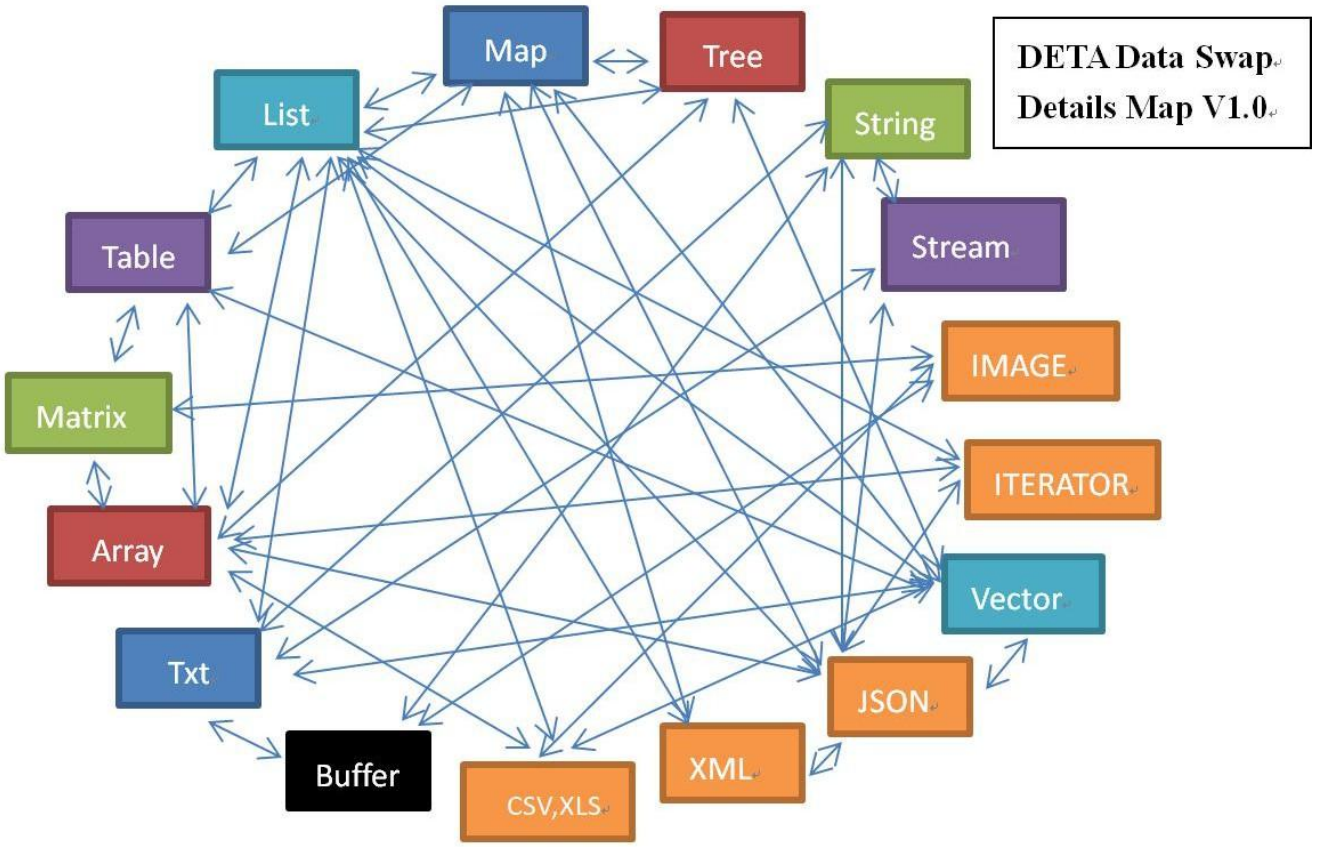


3.6 每一个函数都是最小运行的单一函数，这些函数集合 可自由裁剪，缩小包的体积。

4. 适用范围

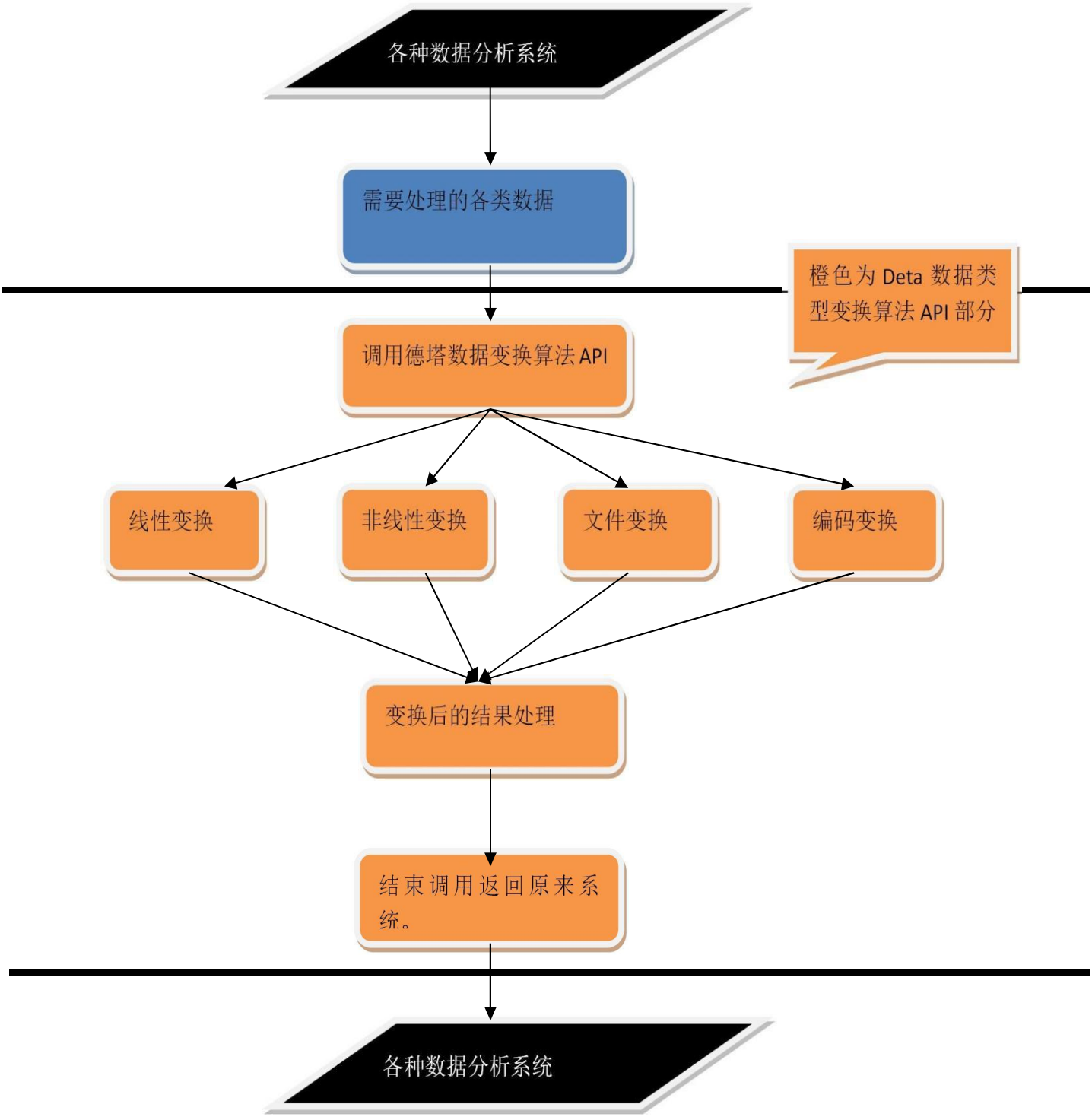
目前世界上所有和多种数据计算打交道的项目。

研发说明


DETA Data Swap
Details Map V1.0
Map
Tree
List
String
Table
Stream
IMAGE
Matrix
ITERATOR
Array
Vector
Txt
JSON
Buffer
XML
CSV,XLS

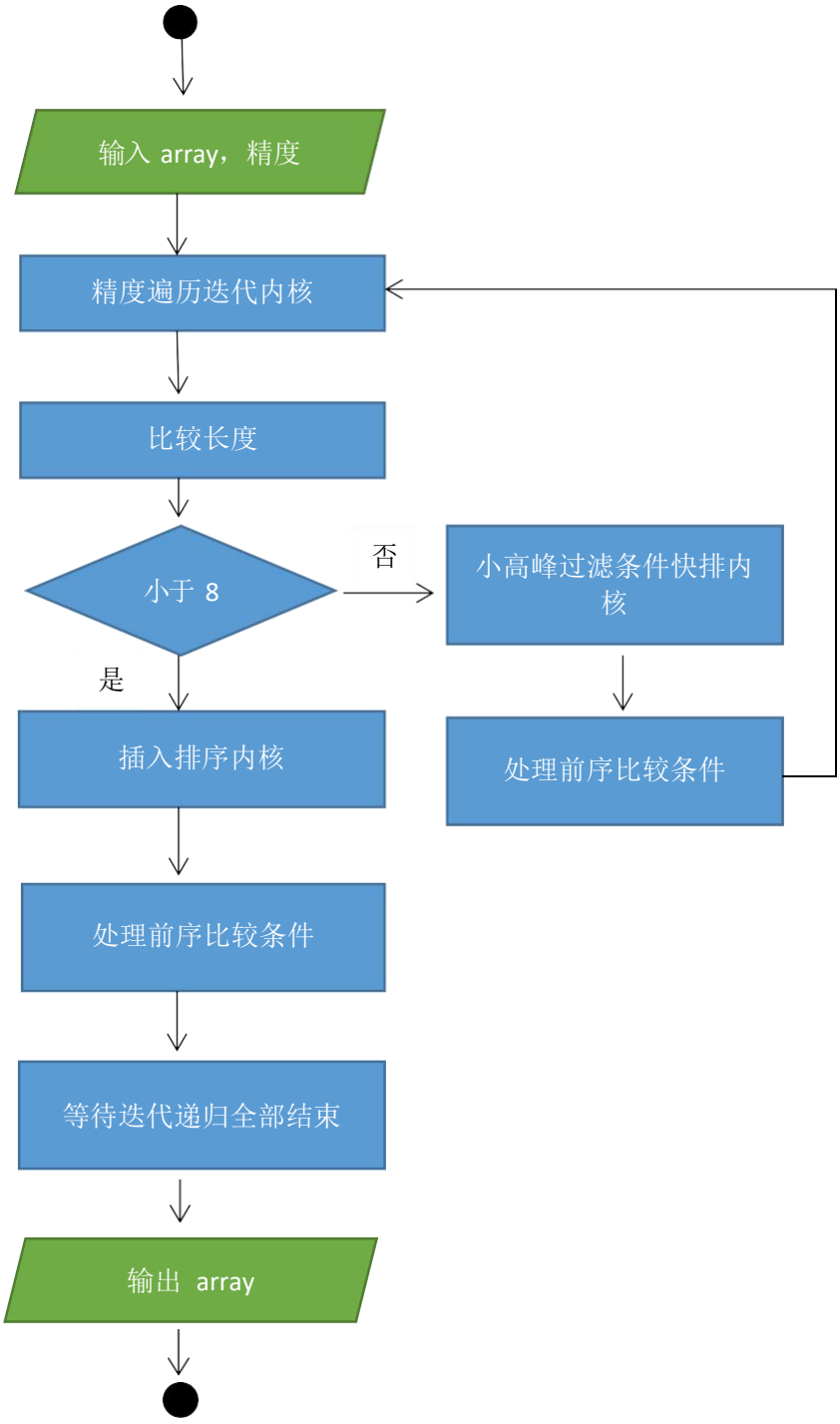
德塔数据结构变量快速转换 引擎系统 复杂点解析 1.0

1 API 使用流程 Flow Chat



2 混合数列排序Flow Chat

`QuickLuoyaoguang4D().quick4DStringArray(String[] a, int lp, int rp, int scale)` 函数



5. 注意

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注意5: 当前版本2019-09-16统一修改为1.0, 一直在优化中,有任何bug请直接联系作者.

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6. 感谢

1感谢印度基督大学数据结构课程

2感谢谷歌提供了gson的json数据格式包。

Deta 项目设计 采用 Mind Master 软件.

Deta 项目研发 采用 Eclipse IDE 软件.

Deta 项目测试 采用 JUNIT API 软件.

Deta 项目作品 主要采用 JAVA JDK8+.

作者长期使用 微星开发机器， 联想笔记本 windows 10操作系统开发此项目, 电脑装Avaster杀毒软件和360软件保证其高效研发环境. 感谢 github和gitee 备份, 节省了作者 大量的存储硬盘, 同时方便 查阅, 逻辑 的鼠标键盘 给作者 提供了迅捷 的输入输出 便利 .当然 电信的网络， 老爸,老妈, 都要感谢的.

7 研发需要清单

7.1 Java 编辑器.

7.2 Jdk8+. Java 虚拟机运行环境.

7.3 Junit 测试包.

7.4 一台连网的电脑.

7.5 谷歌处理Json格式的Gson开源包.

```
package org.deta.tinos.array;
import org.json.XML;
import java.util.ArrayList;
import java.util.HashMap;
import java.util.Iterator;
import java.util.List;
import java.util.Map;
import java.util.Set;
import java.util.TreeSet;
import java.util.Vector;
import org.deta.tinos.stable.Stable;
import org.json.JSONObject;
import com.google.gson.Gson;
public class ArraySwap{
    public static String arrayToJson(Gson gson, Object[] object)
        { return gson.toJson(object);
    }
    public static String arrayToXml(Gson gson, Object[] object)
        { return XML.toString(new
        JSONObject(gson.toJson(object)));
    }
    public static Map<String, Object> arrayToMap(Gson gson
            , Object[] objects) {
        Map<String, Object> map= new HashMap<>();
        int i= 0;
        for(Object object: objects)
            { map.put(Stable.STRING_EMPTY+ i++,
            object);
        }
        return map;
    }
    public static Vector<Object> arrayToVector(Gson gson
            , Object[] objects)
        { Vector<Object> vector= new
        Vector<>(); for(Object object: objects)
        {
            vector.add(object);
        }
        return vector;
    }
    public static List<Object> arrayToList(Object[] objects)
        { List<Object> list= new ArrayList<>();
        for(Object object: objects)
            { list.add(object);
        }
        return list;
    }
```

```
    public static Iterator<Object> arrayToIterator(Object[] objects)
        { List<Object> list= new ArrayList<>();
        for(Object object: objects)
            { list.add(object);
        }
        return list.iterator();
    }
    public static Set<Object> arrayToSet(Object[] objects)
        { Set<Object> sets= new TreeSet<>();
        for(Object object: objects)
            { sets.add(object);
        }
        return sets;
    }
    public static Object[][] arrayToMatrix(Object[] objects, int
        widthRange){ Object[][] output= new Object[widthRange][objects.length/
        widthRange]; for(int i= 0; i< widthRange; i++) {
            for(int j= 0; j< objects.length/ widthRange; j++)
                { output[i][j]= objects[i* widthRange+ j];
            }
        }
        return output;
    }
    public static Object[][][] arrayToMatrix3D(Object[] objects, int widthRange
            , int
        heightRange){ Object[][]
        [] output
        = new Object[widthRange][heightRange][objects.length/ widthRange
                                              / heightRange];
        for(int i= 0; i< widthRange; i++)
            { for(int j= 0; j< heightRange; j++)
            {
                for(int k= 0; k< objects.length/ widthRange/ heightRange; k++)
                    { output[i][j][k]= objects[i* widthRange* heightRange
                                               + j* heightRange+ k];
                }
            }
        }
        return output;
    }
}
```

```
package org.deta.tinos.array;
public class ArrayValidation{
    //以后 validation大体包括 check和fix， 2个部分。
    public static boolean arrayIntCheck(int[] array
            , int min, int max) {
        for(int i= 0; i< array.length; i++)
            { if(array[i]> max|| array[i]< min)
```

```
        {
            return false;
        }
    }
    return true;
}
public static int[] arrayIntFix(int[] array
        , int min, int max) {
    for(int i= 0; i< array.length; i++)
        { if(array[i]> max) {
            array[i]= max;
        }
        if(array[i]< min)
            { array[i]= min;
        }
    }
    return array;
}
public static boolean arrayLongCheck(long[] array
        , long min, long max) {
    for(int i= 0; i< array.length; i++)
        { if(array[i]> max|| array[i]< min)
        {
            return false;
        }
    }
    return true;
}
public static long[] arrayLongFix(long[] array
        , long min, long max) {
    for(int i= 0; i< array.length; i++)
        { if(array[i]> max) {
            array[i]= max;
        }
        if(array[i]< min)
            { array[i]= min;
        }
    }
    return array;
}
public static boolean arrayDoubleCheck(double[] array
        , double min, double max)
    { for(int i= 0; i< array.length; i++)
    {
        if(array[i]> max|| array[i]< min)
            { return false;
        }
    }
    return true;
```

```
    }
    public static double[] arrayDoubleFix(double[] array
            , double min, double max)
        { for(int i= 0; i< array.length; i++)
        {
            if(array[i]> max)
                { array[i]= max;
            }
            if(array[i]< min)
                { array[i]= min;
            }
        }
        return array;
    }
    public static boolean arrayFloatCheck(float[] array
            , float min, float max)
        {  for(int i= 0; i< array.length; i++)
        {
            if(array[i]> max|| array[i]< min)
                { return false;
            }
        }
        return true;
    }
    public static float[] arrayFloatFix(float[] array
            , float min, float max)
        {  for(int i= 0; i< array.length; i++)
        {
            if(array[i]> max)
                { array[i]= max;
            }
            if(array[i]< min)
                { array[i]= min;
            }
        }
        return array;
    }
}
```

```
package org.deta.tinos.csv;
import java.io.FileInputStream;
import java.io.IOException;
import java.util.ArrayList;
import java.util.List;
import java.util.Map;
import org.apache.poi.hssf.usermodel.HSSFCell;
import org.apache.poi.hssf.usermodel.HSSFDateUtil;
import org.apache.poi.hssf.usermodel.HSSFRow;
import org.apache.poi.hssf.usermodel.HSSFSheet;
```

```
import org.apache.poi.hssf.usermodel.HSSFWorkbook;
import org.apache.poi.poifs.filesystem.POIFSFileSystem;
@SuppressWarnings("static-access")
public class CSVSwap{
    public static Object[][] xlsOrCsvFileToObjectMartix(String filePath
            , int pageSheetIndex) throws IOException {
        FileInputStream fileInputStream= new FileInputStream(filePath);
        POIFSFileSystem pOIFSFileSystem= new POIFSFileSystem(fileInputStream);
        HSSFWorkbook hSSFWorkbook= new HSSFWorkbook(pOIFSFileSystem);
        HSSFSheet hSSFSheet= hSSFWorkbook.getSheetAt(Integer
                .valueOf(pageSheetIndex));
        HSSFRow hSSFRow= hSSFSheet.getRow(0);
        Object[][] output= new String[hSSFSheet.getPhysicalNumberOfRows()]
                [hSSFRow.getLastCellNum()];
        for (int i= 0; i< hSSFSheet.getPhysicalNumberOfRows(); i++) {//ROW
            if (null!= (hSSFRow= hSSFSheet.getRow(i))) {
                for(int j= 0; j< hSSFRow.getLastCellNum(); j++){//CULUMN
                    HSSFCell hSSFCell= hSSFRow.getCell(j);
                    if(hSSFCell.CELL_TYPE_STRING== hSSFCell.getCellType()){
                        output[i][j]= hSSFCell.getStringCellValue();
                    }
                    if(hSSFCell.CELL_TYPE_BOOLEAN==
                        hSSFCell.getCellType()){ output[i][j]=
                        hSSFCell.getBooleanCellValue();
                    }
                                if(hSSFCell.CELL_TYPE_NUMERIC==
            hSSFCell.getCellType()){ if(HSSFDateUtil.isCellDateFormatted(hSSFCell)){
                            output[i][j]= hSSFCell.getDateCellValue();
                        }else{
                            output[i][j]= hSSFCell.getNumericCellValue();
                        }
                    }
                    if(hSSFCell.CELL_TYPE_ERROR==
                        hSSFCell.getCellType()){ output[i][j]=
                        hSSFCell.getErrorCellValue();
                    }
                }
            }
        }
        return output;
    }
    public static List<Object[]> xlsOrCsvFileToListObject(String filePath
            , int pageSheetIndex) throws IOException {
        FileInputStream fileInputStream= new FileInputStream(filePath);
        POIFSFileSystem pOIFSFileSystem= new POIFSFileSystem(fileInputStream);
        HSSFWorkbook hSSFWorkbook= new HSSFWorkbook(pOIFSFileSystem);
        HSSFSheet hSSFSheet= hSSFWorkbook.getSheetAt(Integer
                .valueOf(pageSheetIndex));
        HSSFRow hSSFRow= hSSFSheet.getRow(0);
```

```
    List<Object[]> list= new ArrayList<>();
    for (int i= 0; i< hSSFSheet.getPhysicalNumberOfRows(); i++) {//ROW
        Object[] objectRow= new String[hSSFRow.getLastCellNum()];
        if (null!= (hSSFRow= hSSFSheet.getRow(i))) {
            for(int j= 0; j< hSSFRow.getLastCellNum(); j++){//CULUMN
                HSSFCell hSSFCell= hSSFRow.getCell(j);
                if(hSSFCell.CELL_TYPE_STRING== hSSFCell.getCellType()){
                    objectRow[j]= hSSFCell.getStringCellValue();
                }
                if(hSSFCell.CELL_TYPE_BOOLEAN==
                    hSSFCell.getCellType()){ objectRow[j]=
                    hSSFCell.getBooleanCellValue();
                }
                            if(hSSFCell.CELL_TYPE_NUMERIC==
        hSSFCell.getCellType()){ if(HSSFDateUtil.isCellDateFormatted(hSSFCell)){
                        objectRow[j]= hSSFCell.getDateCellValue();
                    }else{
                        objectRow[j]= hSSFCell.getNumericCellValue();
                    }
                }
                if(hSSFCell.CELL_TYPE_ERROR==
                    hSSFCell.getCellType()){ objectRow[j]=
                    hSSFCell.getErrorCellValue();
                }
            }
        }
        list.add(objectRow);
    }
    return list;
}
public static List<Object[]> xlsOrCsvFileToRangedListObject(String filePath
        , int pageSheetIndex, Map<Integer, Boolean> rows
        , Map<Integer, Boolean> culumns) throws IOException
    { FileInputStream fileInputStream= new FileInputStream(filePath);
    POIFSFileSystem pOIFSFileSystem= new POIFSFileSystem(fileInputStream);
    HSSFWorkbook hSSFWorkbook= new HSSFWorkbook(pOIFSFileSystem);
    HSSFSheet hSSFSheet= hSSFWorkbook
            .getSheetAt(Integer.valueOf(pageSheetIndex));
    HSSFRow hSSFRow= hSSFSheet.getRow(0);
    List<Object[]> list= new ArrayList<>();
    for (int i= 0; i< hSSFSheet.getPhysicalNumberOfRows()
            && rows.containsKey(i); i++) {//ROW
        Object[] objectRow= new String[hSSFRow.getLastCellNum()];
        if (null!= (hSSFRow= hSSFSheet.getRow(i))) {
            for(int j= 0; j< hSSFRow.getLastCellNum()
                    && culumns.containsKey(j); j++){//CULUMN
                HSSFCell hSSFCell= hSSFRow.getCell(j);
                if(hSSFCell.CELL_TYPE_STRING==
                    hSSFCell.getCellType()){ objectRow[j]=
```

```
                    hSSFCell.getStringCellValue();
                }
                if(hSSFCell.CELL_TYPE_BOOLEAN==
                    hSSFCell.getCellType()){ objectRow[j]=
                    hSSFCell.getBooleanCellValue();
                }
                            if(hSSFCell.CELL_TYPE_NUMERIC==
        hSSFCell.getCellType()){ if(HSSFDateUtil.isCellDateFormatted(hSSFCell)){
                        objectRow[j]= hSSFCell.getDateCellValue();
                    }else{
                        objectRow[j]= hSSFCell.getNumericCellValue();
                    }
                }
                if(hSSFCell.CELL_TYPE_ERROR==
                    hSSFCell.getCellType()){ objectRow[j]=
                    hSSFCell.getErrorCellValue();
                }
            }
        }
        list.add(objectRow);
    }
    return list;
}
public static Object[][] xlsOrCsvFileToRangedObjectMartix(String filePath
        , int pageSheetIndex, Map<Integer, Boolean> rows
        , Map<Integer, Boolean> culumns) throws IOException
    { FileInputStream fileInputStream= new FileInputStream(filePath);
    POIFSFileSystem pOIFSFileSystem= new POIFSFileSystem(fileInputStream);
    HSSFWorkbook hSSFWorkbook= new HSSFWorkbook(pOIFSFileSystem);
    HSSFSheet hSSFSheet= hSSFWorkbook
            .getSheetAt(Integer.valueOf(pageSheetIndex));
    HSSFRow hSSFRow= hSSFSheet.getRow(0);
    Object[][] output= new String[hSSFSheet.getPhysicalNumberOfRows()]
            [hSSFRow.getLastCellNum()];
    for (int i= 0; i< hSSFSheet.getPhysicalNumberOfRows()
            && rows.containsKey(i); i++) {//ROW
        if (null!= (hSSFRow= hSSFSheet.getRow(i)))
            { for(int j= 0; j<
            hSSFRow.getLastCellNum()
                    && culumns.containsKey(j); j++){//CULUMN
                HSSFCell hSSFCell= hSSFRow.getCell(j);
                if(hSSFCell.CELL_TYPE_STRING==
                    hSSFCell.getCellType()){ output[i][j]=
                    hSSFCell.getStringCellValue();
                }
                if(hSSFCell.CELL_TYPE_BOOLEAN==
                    hSSFCell.getCellType()){ output[i][j]=
                    hSSFCell.getBooleanCellValue();
                }
```

```
                                if(hSSFCell.CELL_TYPE_NUMERIC==
            hSSFCell.getCellType()){ if(HSSFDateUtil.isCellDateFormatted(hSSFCell)){
                                output[i][j]= hSSFCell.getDateCellValue();
                            }else{
                                output[i][j]= hSSFCell.getNumericCellValue();
                            }
                        }
                        if(hSSFCell.CELL_TYPE_ERROR==
                            hSSFCell.getCellType()){ output[i][j]=
                            hSSFCell.getErrorCellValue();
                        }
                    }
                }
            }
        return output;
    }
}
```

```
package org.deta.tinos.date;
import java.sql.Timestamp;
import java.util.Date;
import org.deta.tinos.stable.Stable;
@SuppressWarnings({Stable.SUPPRESS_WARNINGS_DEPRECATION
    , Stable.SUPPRESS_WARNINGS_STATIC_ACCESS})
public class DateSwap{
    public static String dateToGMTString(Date date)
        { return date.toGMTString();
    }
    public static String dateToYYYYMMDD(Date date)
        { return Stable.STRING_EMPTY+ date.getYear()
        + Stable.STRING_PER+ date.getMonth()
        + Stable.STRING_PER+ date.getDay();
    }
    public static String dateToHHMMSS(Date date)
        { return Stable.STRING_EMPTY+
        date.getHours()
        + Stable.STRING_PER+ date.getMinutes()
        + Stable.STRING_PER+ date.getSeconds();
    }
    public static String dateToMiliSeconds(Date date)
        { return Stable.STRING_EMPTY+ date.getTime();
    }
    public static String getCurrentMiliSeconds(Date date)
        { return Stable.STRING_EMPTY+ new Date().getTime();
    }
    public static Timestamp dateToTimeStamp(Date date) {
        long utc= date.UTC(date.getYear(), date.getMonth(), date.getDay()
                , date.getHours(), date.getMinutes(), date.getSeconds());
        return new Timestamp(utc);
```

```
    }
    public static long timeStampToMiliSeconds(Timestamp timestamp)
        { return timestamp.getTime();
    }
    public static String timeStampToMiliSecondsWithSize(Timestamp timestamp
            , int size) {
        String time= Stable.STRING_EMPTY+ timestamp.getTime();
        return time.substring(0, size);
    }
    public static String dateStringToMiliSeconds(String string)
        { return Stable.STRING_EMPTY+ new Date(string).getTime();
    }
}
```

```
package org.deta.tinos.date;
import java.io.IOException;
import java.net.URL;
import java.net.URLConnection;
import java.util.Date;
import org.deta.tinos.stable.Stable;
//refer www.bjtime.com 第 12，13，14 行 共三行
//注意如果 bjtime 网站关闭了这个功能，该函数将无效，请再互联网搜索其他提供时间校验的网址。
public class DateValidation{
    public static boolean currentSystemTimeCheck(long offsetUTC8
            , long miliSecondsDistinction) throws IOException
        { URL url= new URL(Stable.STRING_BJTIME);
        URLConnection uRLConnection= url.openConnection();
        uRLConnection.connect();
        long bjtime= uRLConnection.getDate();
        long system= currentSystemTimeToUTC(offsetUTC8);
        if(miliSecondsDistinction< Math.abs(bjtime- system)) {
            return false;
        }
        return true;
    }
    public static long currentSystemTimeToUTC(long offsetUTC8)
        { return new Date().getTime()+ offsetUTC8;
    }
}
```

```
package org.deta.tinos.hash;
import com.google.gson.Gson;
import java.util.ArrayList;
import java.util.Hashtable;
import java.util.Iterator;
import java.util.List;
import org.json.JSONObject;
import org.json.XML;
public class HashSwap{
```

```
    public static String hashTableToJson(Gson gson
            , Hashtable<String, Object> hashtable)
        { return gson.toJson(hashtable);
    }
    public static String hashTableToXml(Gson gson
            , Hashtable<String, Object> hashtable){
        JSONObject jSONObject= new JSONObject(gson.toJson(hashtable));
        return XML.toString(jSONObject);
    }
    public static List<Object> hashTableToList(Gson gson
            , Hashtable<String, Object>
        hashtable){ List<Object> list= new
        ArrayList<>();
        Iterator<String> iterator= hashtable.keySet().iterator();
        while(iterator.hasNext()) {
            list.add(hashtable.get(iterator.next()));
        }
        return list;
    }
    public static Object[] hashTableToObjectArray(Gson gson
            , Hashtable<String, Object>
        hashtable){ List<Object> list= new
        ArrayList<>();
        Iterator<String> iterator= hashtable.keySet().iterator();
        while(iterator.hasNext())
            { list.add(hashtable.get(iterator.next()))
            ;
        }
        return list.toArray();
    }
}
```

```
package org.deta.tinos.http;
import java.io.BufferedReader;
import  java.io.IOException;
import  java.io.InputStream;
import java.io.InputStreamReader;
import java.io.OutputStream;
import java.net.HttpURLConnection;
import java.net.URL;
import org.deta.tinos.stable.Stable;
public class HttpUnicode{
    //这个函数在作者去年开发股市分析软件的时候从雪球等网站采样抓数据，发现有 GBK
    //utf-8 gb2312 ascii 等格式数据比较混乱，于是进行统一格式处理。
    public String getJson(String urlString, String jsonString)
            throws IOException{
        String code= Stable.STRING_EMPTY;
        URL url= new URL(urlString);
        HttpURLConnection connection= (HttpURLConnection)url.openConnection();
```

```
connection.setRequestMethod(Stable.HTTP_GET);
connection
.setRequestProperty(Stable.CONTENT_TYPE, Stable.APPLICATION_JSON_UTF8);
connection.setDoOutput(true);
connection.setInstanceFollowRedirects(false);
StringBuffer sbuffer= new StringBuffer();
sbuffer.append(jsonString);
OutputStream os= connection.getOutputStream();
os.write(sbuffer.toString().getBytes());
os.flush();
StringBuilder stringBuilder= new StringBuilder();
BufferedReader bufferedReader= null;
try {
    InputStream inputStream= connection.getInputStream();
    int caherset_size= connection.getHeaderFields().size();
    for(int i= 0; i< caherset_size; i++) {
        String temp= connection.getHeaderField(i);
        if(temp.contains(Stable.CHARSET)) {
            if(temp.toUpperCase().contains(Stable.CHARSET_GBK))
                { code= Stable.CHARSET_GBK;
            }
            if(temp.toUpperCase().contains(Stable.CHARSET_UTF_8)
                    || temp.toUpperCase().contains(Stable.CHARSET_UTF8))
                { code= Stable.CHARSET_UTF_8;
            }
            if(temp.toUpperCase().contains(Stable.CHARSET_GB2312))
                { code= Stable.CHARSET_GB2312;
            }
            if(temp.toUpperCase().contains(Stable.CHARSET_ASCII))
                { code= Stable.CHARSET_ASCII;
            }
            if(temp.toUpperCase().contains(Stable.CHARSET_UNICODE))
                { code= Stable.CHARSET_UNICODE;
            }
            if(temp.toUpperCase().contains(Stable.CHARSET_ISO_8859_1))
                { code= Stable.CHARSET_ISO_8859_1;
            }
        }
    }
    if (null!= inputStream)
        { bufferedReader
        =  new BufferedReader(new InputStreamReader(inputStream, code));
        String lines;
        while ((lines= bufferedReader.readLine()) != null)
            { stringBuilder.append(lines);
        }
    } else {
        stringBuilder.append(Stable.STRING_EMPTY);
    }
```

```
    } catch (IOException ex) {
        //throw ex;
    } finally {
        if (null!= bufferedReader)
            { try {
                bufferedReader.close();
            } catch (IOException ex) {
                //throw ex;
            }
        }
    }
    return new String(stringBuilder.toString().getBytes(), Stable.CHARSET_UTF_8);
}
public String postXML(String urlString,String XMLString) throws
    IOException{ URL url= new URL(urlString);
    HttpURLConnection connection= (HttpURLConnection)url.openConnection();
    connection.setRequestMethod(Stable.HTTP_POST);
    connection.setRequestProperty(Stable.CONTENT_TYPE, Stable.APPLICATION_XML);
    connection.setDoOutput(true);
    connection.setInstanceFollowRedirects(false);
    StringBuffer stringBuffer= new StringBuffer();
    stringBuffer.append(XMLString);
    OutputStream outputStream= connection.getOutputStream();
    outputStream.write(stringBuffer.toString().getBytes());
    outputStream.flush();
    String requestBody= Stable.STRING_EMPTY;
    StringBuilder stringBuilder= new StringBuilder();
    BufferedReader bufferedReader= null;
    try {
        InputStream inputStream= connection.getInputStream();
        if (null!= inputStream) {
            bufferedReader
            = new BufferedReader(new InputStreamReader(inputStream));
            char[] charBuffer= new char[128];
            int bytesRead= -1;
            while ((bytesRead= bufferedReader.read(charBuffer)) > 0)
                { stringBuilder.append(charBuffer, 0, bytesRead);
            }
        } else {
            stringBuilder.append(Stable.STRING_EMPTY);
        }
    } catch (IOException ex)
        { throw ex;
    } finally {
        if (null!= bufferedReader)
            { try {
                bufferedReader.close();
            } catch (IOException ex)
                { throw ex;
```

```
            }
        }
    }
    requestBody= stringBuilder.toString();
    return requestBody;
}
public String postJsonWithSercurity(String urlString
        , String jsonString) throws
    IOException{ URL url= new URL(urlString);
    HttpURLConnection connection= (HttpURLConnection)url.openConnection();
    connection.setRequestMethod(Stable.HTTP_POST);
    connection.setRequestProperty(Stable.CONTENT_TYPE, Stable.APPLICATION_JSON);
    connection.setDoOutput(true);
    connection.setInstanceFollowRedirects(false);
    StringBuffer sbuffer= new StringBuffer();
    sbuffer.append(jsonString);
    OutputStream os= connection.getOutputStream();
    os.write(sbuffer.toString().getBytes());
    os.flush();
    String requestBody= Stable.STRING_EMPTY;
    StringBuilder stringBuilder= new StringBuilder();
    BufferedReader bufferedReader= null;
    try {
        InputStream inputStream= connection.getInputStream();
        if (null!= inputStream) {
            bufferedReader
            = new BufferedReader(new InputStreamReader(inputStream));
            char[] charBuffer= new char[128];
            int bytesRead= -1;
            while ((bytesRead= bufferedReader.read(charBuffer)) > 0)
                { stringBuilder.append(charBuffer, 0, bytesRead);
            }
        } else {
            stringBuilder.append(Stable.STRING_EMPTY);
        }
    } catch (IOException ex)
        { throw ex;
    } finally {
        if (null!= bufferedReader)
            { try {
                bufferedReader.close();
            } catch (IOException ex)
                { throw ex;
            }
        }
    }
    requestBody= stringBuilder.toString();
    return requestBody;
}
```

```
public String postXMLWithSercurity(String urlString, String XMLString)
        throws IOException{
    URL url= new URL(urlString);
    HttpURLConnection connection= (HttpURLConnection)url.openConnection();
    connection.setRequestMethod(Stable.HTTP_POST);
    connection.setRequestProperty(Stable.CONTENT_TYPE, Stable.APPLICATION_XML);
    connection.setDoOutput(true);
    connection.setInstanceFollowRedirects(false);
    StringBuffer sbuffer= new StringBuffer();
    sbuffer.append(XMLString);
    OutputStream os= connection.getOutputStream();
    os.write(sbuffer.toString().getBytes());
    os.flush();
    String requestBody= Stable.STRING_EMPTY;
    StringBuilder stringBuilder= new StringBuilder();
    BufferedReader bufferedReader= null;
    try {
        InputStream inputStream= connection.getInputStream();
        if (null!= inputStream) {
            bufferedReader= new BufferedReader
                    (new InputStreamReader(inputStream));
            char[] charBuffer= new char[128];
            int bytesRead= -1;
            while ((bytesRead= bufferedReader.read(charBuffer)) > 0)
                { stringBuilder.append(charBuffer, 0, bytesRead);
            }
        } else {
            stringBuilder.append(Stable.STRING_EMPTY);
        }
    } catch (IOException ex)
        { throw ex;
    } finally {
        if (null!= bufferedReader)
            { try {
                bufferedReader.close();
            } catch (IOException ex)
                { throw ex;
            }
        }
    }
    requestBody= stringBuilder.toString();
    return requestBody;
}
public String getStatusFromString(String response)
    { for(int i=0;i<response.length();i++){
    }
    return null;
}
public String getHTML(String urlString, Object object) throws IOException
```

```
{ URL url= new URL(urlString);
HttpURLConnection connection= (HttpURLConnection)url.openConnection();
connection.setRequestMethod(Stable.HTTP_GET);
connection.setDoOutput(true);
connection.setInstanceFollowRedirects(false);
StringBuilder stringBuilder= new StringBuilder();
BufferedReader bufferedReader= null;
String code= Stable.CHARSET_GB2312;
try {
    InputStream inputStream= connection.getInputStream();
    int caherset_size= connection.getHeaderFields().size();
    for(int i= 0; i< caherset_size; i++) {
        String temp= connection.getHeaderField(i);
        if(temp.contains(Stable.CHARSET)|| temp.contains(Stable.TYPE) ) {
            if(temp.toUpperCase().contains(Stable.CHARSET_GBK))
                { code= Stable.CHARSET_GBK;
            }
            if(temp.toUpperCase().contains(Stable.CHARSET_UTF_8)
                    || temp.toUpperCase().contains(Stable.CHARSET_UTF8))
                { code= Stable.CHARSET_UTF_8;
            }
            if(temp.toUpperCase().contains(Stable.CHARSET_GB2312))
                { code= Stable.CHARSET_GB2312;
            }
            if(temp.toUpperCase().contains(Stable.CHARSET_ASCII)) {
                code= Stable.CHARSET_ASCII;
            }
            if(temp.toUpperCase().contains(Stable.CHARSET_UNICODE))
                { code= Stable.CHARSET_UNICODE;
            }
            if(temp.toUpperCase().contains(Stable.CHARSET_ISO_8859_1))
                { code= Stable.CHARSET_ISO_8859_1;
            }
        }
    }
    if (null!= inputStream) {
        bufferedReader= new BufferedReader(new InputStreamReader(inputStream,code));
        char[] charBuffer= new char[128];
        int bytesRead= -1;
        while ((bytesRead= bufferedReader.read(charBuffer)) > 0)
            { stringBuilder.append(charBuffer, 0, bytesRead);
        }
    } else {
        stringBuilder.append(Stable.STRING_EMPTY);
    }
} catch (IOException ex) {
} finally {
    if (null!= bufferedReader)
        { try {
```

```
                    bufferedReader.close();
                } catch (IOException ex) {
                }
            }
        }
        String out= new String(stringBuilder.toString().getBytes(), Stable.CHARSET_UTF_8);
        return out;
    }
}
```

```
package org.deta.tinos.image;
import java.io.File;
import java.io.IOException;
import javax.imageio.ImageIO;
import java.awt.Image;
import java.awt.image.BufferedImage;
public class ImageSwap{
    public static void pixTableToFile(String pngOutputPath, int[][] pix
            , String fileType) throws IOException{
        BufferedImage bufferedImage= new BufferedImage(pix[0].length
                , pix.length, BufferedImage.TYPE_INT_RGB);
        for (int i= 0; i< bufferedImage.getHeight(); ++i) {
            for (int j= 0; j< bufferedImage.getWidth(); ++j)
                { bufferedImage.setRGB(j, i, (pix[i][j]<< 16)
                        | (pix[i][j]<< 8)| (pix[i][j]));
            }
        }
        ImageIO.write(bufferedImage, fileType, new File(pngOutputPath));
    }
    public static void pixRGBTableToFile(String pngOutputPath, int[][] pixRed
            , int[][] pixGreen, int[][] pixBlue, String fileType)
                    throws IOException{
        BufferedImage bufferedImage= new BufferedImage(pixRed[0].length
                , pixRed.length, BufferedImage.TYPE_INT_RGB);
        for (int i= 0; i< bufferedImage.getHeight(); ++i) {
            for (int j= 0; j< bufferedImage.getWidth(); ++j)
                { bufferedImage.setRGB(j, i, (pixRed[i][j]<<
                16)
                        | (pixGreen[i][j]<< 8)| (pixBlue[i][j]));
            }
        }
        ImageIO.write(bufferedImage, fileType, new File(pngOutputPath));
    }
    public static void bufferedImageToFile(String pngOutputPath
            , BufferedImage bufferedImage, String fileType) throws
        IOException{ ImageIO.write(bufferedImage, fileType, new
        File(pngOutputPath));
    }
    public static void imageToFile(String pngOutputPath, Image image
```

```
            , String fileType)throws
        IOException{ ImageIO.write((BufferedImage)image, fileType, new
        File(pngOutputPath));
    }
    public static void bufferedImageToScaleImageFile(String pngOutputPath
            , BufferedImage bufferedImage, String fileType
            , int scale) throws
        IOException{ bufferedImage=
        (BufferedImage)bufferedImage
                .getScaledInstance(bufferedImage.getWidth()
                , bufferedImage.getHeight(), scale);
        ImageIO.write(bufferedImage, fileType, new File(pngOutputPath));
    }
}
```

```
package org.deta.tinos.iterator;
import java.util.ArrayList;
import java.util.Iterator;
import java.util.List;
import java.util.Map;
import org.json.JSONObject;
import org.json.XML;
import com.google.gson.Gson;
import com.google.gson.reflect.TypeToken;
public class IteratorSwap{
    public static String iteratorToJsonString(Gson gson
            , Iterator<Object>
        iterator){ return
        gson.toJson(iterator);
    }
    public static Object stringIteratorToJsonString(Gson gson
            , Iterator<String> iterator)
        { return gson.toJson(iterator);
    }
    public static String iteratorToXml(Gson gson, Iterator<Object>
        iterator){ return XML.toString(new JSONObject(gson.toJson(iterator)));
    }
    public static String iteratorToMap(Gson gson, Iterator<Object>
        iterator){ return gson.fromJson(new
        JSONObject(gson.toJson(iterator)).toString()
                , new TypeToken<Map<String, Object>>(){}.getType());
    }
    public static Object[] iteratorToObjectArray(Gson gson
            , Iterator<Object>
        iterator){ List<Object> list= new
        ArrayList<>();
        while(iterator.hasNext()) {
            list.add(iterator.next());
        }
```

```
        return list.toArray();
    }
    public static List<Object> iteratorToList(Gson gson
            , Iterator<Object>
        iterator){ List<Object> list= new
        ArrayList<>();
        while(iterator.hasNext()) {
            list.add(iterator.next());
        }
        return list;
    }
}
```

```
package org.deta.tinos.json;
import java.util.Map;
import java.util.List;
import java.lang.reflect.Type;
import java.util.ArrayList;
import java.util.Hashtable;
import org.json.JSONArray;
import org.json.JSONObject;
import org.json.XML;
import com.google.gson.Gson;
import com.google.gson.reflect.TypeToken;
public class JsonSwap{
    public static List<Object> jsonArrayToList(JSONArray jSONArray)
        { List<Object> list= new ArrayList<>();
        for(int i= 0; i< jSONArray.length();
            i++){ Object object= jSONArray.get(i);
            if(object instanceof JSONObject){
                list.add(new Gson().fromJson(jSONArray.getJSONObject(i).toString()
                        , new TypeToken<Map<String, Object>>(){}.getType()));
            }else if(object instanceof String){
                list.add(String.valueOf(object));
            }else if(object instanceof
                JSONArray){ list.add(jsonArrayToList(jSONArray.getJSONArray(i)));
            }
        }
        return list;
    }
    public static String jsonObjectToString(JSONObject
        jSONObject){ return jSONObject.toString();
    }
    public static Hashtable<String, Object> jsonObjectToHashtable(Gson gson
            ,JSONObject jSONObject){
        return gson.fromJson(jSONObject.toString()
                , (Type) new Hashtable<String, Object>());
    }
    public static String jsonObjectToXml(JSONObject
```

```
        jSONObject){ return XML.toString(jSONObject);
    }
}
```

```
package org.deta.tinos.list;
import java.util.Iterator;
import java.util.List;
import java.util.Map;
import java.util.Set;
import java.util.TreeSet;
import java.util.Vector;
import org.json.JSONObject;
import org.json.XML;
import com.google.gson.Gson;
import com.google.gson.reflect.TypeToken;
public class ListSwap{
    public static String listToJsonString(Gson gson, List<Object>
        list){ return gson.toJson(list);
    }
    public static Object stringListToJsonString(Gson gson, List<String> list)
        { return gson.toJson(list);
    }
    public static String listToXml(Gson gson, List<Object>
        list){ return XML.toString(new
        JSONObject(gson.toJson(list)));
    }
    public static String listToMap(Gson gson, List<Object> list){
        return gson.fromJson(new JSONObject(gson.toJson(list)).toString()
                , new TypeToken<Map<String, Object>>(){}.getType());
    }
    public static Object[] listToObjectArray(List<Object>
        list){ return list.toArray();
    }
    public static Iterator<Object> listToIterator(List<Object> list){
        return list.iterator();
    }
    public static Vector<Object> listToVector(List<Object>
        list){ Vector<Object> vector= new Vector<>();
        Iterator<Object> iterator= list.iterator();
        while(iterator.hasNext()) {
            vector.add(iterator.next());
        }
        return vector;
    }
    public static Set<Object> listToSet(List<Object>
        list){ Set<Object> sets= new  TreeSet<>();
        Iterator<Object> iterator= list.iterator();
        while(iterator.hasNext()) {
            sets.add(iterator.next());
```

```
        }
        return sets;
    }
}
```

```
package org.deta.tinos.list;
import java.util.ArrayList;
import java.util.Iterator;
import java.util.List;
import org.deta.tinos.stable.Stable;
public class ListValidation{
    public static boolean ListSetsCheck(List<Object> list, String setsType)
        { Iterator<Object> iterator= list.iterator();
        while(iterator.hasNext()) {
            Object object= iterator.next();
            if(setsType.equalsIgnoreCase(Stable.STRING_DOUBLE)) {
                if(!(object instanceof Double))
                    { return false;
                }
            }
            if(setsType.equalsIgnoreCase(Stable.STRING_INT))
                { if(!(object instanceof Integer)) {
                    return false;
                }
            }
            if(setsType.equalsIgnoreCase(Stable.STRING_FLOAT))
                { if(!(object instanceof Float)) {
                    return false;
                }
            }
            if(setsType.equalsIgnoreCase(Stable.STRING_STRING))
                { if(!(object instanceof String)) {
                    return false;
                }
            }
            if(setsType.equalsIgnoreCase(Stable.STRING_SHORT))
                { if(!(object instanceof Short)) {
                    return false;
                }
            }
            if(setsType.equalsIgnoreCase(Stable.STRING_BOOLEAN))
                { if(!(object instanceof Boolean)) {
                    return false;
                }
            }
            if(setsType.equalsIgnoreCase(Stable.STRING_LONG))
                { if(!(object instanceof Long)) {
                    return false;
                }
```

```
        }
        if(setsType.equalsIgnoreCase(Stable.STRING_BYTE))
            { if(!(object instanceof Byte)) {
                return false;
            }
        }
    }
    return true;
}
public static List<Object> ListSetsFix(List<Object> list
        , String setsType) {
    List<Object> output= new ArrayList<>();
    Iterator<Object> iterator= list.iterator();
    while(iterator.hasNext()) {
        Object object= iterator.next();
        if(setsType.equalsIgnoreCase(Stable.STRING_DOUBLE)) {
            if(!(object instanceof Double))
                { output.add((double)0.00);
            }else {
                output.add(object);
            }
        }
        if(setsType.equalsIgnoreCase(Stable.STRING_INT))
            { if(!(object instanceof Integer)) {
                output.add((int)0);
            }else {
                output.add(object);
            }
        }
        if(setsType.equalsIgnoreCase(Stable.STRING_FLOAT))
            { if(!(object instanceof Float)) {
                output.add((float)0.0);
            }else {
                output.add(object);
            }
        }
        if(setsType.equalsIgnoreCase(Stable.STRING_STRING))
            { if(!(object instanceof String)) {
                output.add(Stable.STRING_EMPTY);
            }else {
                output.add(object);
            }
        }
        if(setsType.equalsIgnoreCase(Stable.STRING_SHORT))
            { if(!(object instanceof Short)) {
                output.add((short)0);
            }else {
                output.add(object);
            }
```

```
            }
            if(setsType.equalsIgnoreCase(Stable.STRING_BOOLEAN))
                { if(!(object instanceof Boolean)) {
                    output.add(false);
                }else {
                    output.add(object);
                }
            }
            if(setsType.equalsIgnoreCase(Stable.STRING_LONG))
                { if(!(object instanceof Long)) {
                    output.add((long)(0));
                }else {
                    output.add(object);
                }
            }
            if(setsType.equalsIgnoreCase(Stable.STRING_BYTE))
                { if(!(object instanceof Byte)) {
                    output.add((byte)0);
                }else {
                    output.add(object);
                }
            }
        }
        return output;
    }
}
```

```
package org.deta.tinos.map;
import java.util.ArrayList;
import java.util.HashMap;
import java.util.Hashtable;
import java.util.Iterator;
import java.util.List;
import java.util.Map;
public class MapSwap{
    public static List<Map<String, Object>> mapToList(Map<String, Object>
        map){ List<Map<String, Object>> list= new ArrayList<>();
        Iterator<String> iterator= map.keySet().iterator();
        while(iterator.hasNext()) {
            String string= iterator.next();
            Map<String, Object> singer= new HashMap<>();
            singer.put(string, map.get(string));
            list.add(singer);
        }
        return list;
    }
    public static Hashtable<String, Object> mapToHash(Map<String, Object>
        map){ Hashtable<String, Object> hashtable= new Hashtable<>();
        Iterator<String> iterator= map.keySet().iterator();
```

```
        while(iterator.hasNext()) {
            String string= iterator.next();
            hashtable.put(string, map.get(string));
        }
        return hashtable;
    }
}
```

```
package org.deta.tinos.matrix;
public class MatrixSwap{
    public static Object[][] matrixInclineSwap(Object[][]
        objects){ Object[][] output= new
        Object[objects[0].length][objects.length]; for(int i= 0; i<
        objects.length; i++) {
            for(int j= 0; j< objects[0].length; j++)
                { output[j][i]= objects[i][j];
            }
        }
        return output;
    }
    public static Object[][] matrixPostSwap(Object[][]
        objects){ Object[][] output= new
        Object[objects.length][objects[0].length]; for(int i= 0; i<
        objects.length; i++) {
            for(int j= 0; j< objects[0].length; j++)
                { output[i][objects[0].length- j]=
                objects[i][j];
            }
        }
        return output;
    }
    public static Object[][] matrixInSwap(Object[][]
        objects){  Object[][] output= new
        Object[objects.length][objects[0].length]; for(int i= 0; i<
        objects.length; i++) {
            for(int j= 0; j< objects[0].length; j++)
                { output[objects.length- i][j]=
                objects[i][j];
            }
        }
        return output;
    }
    public static Object[][] matrixReverseSwap(Object[][]
        objects){ Object[][] output= new
        Object[objects.length][objects[0].length]; for(int i= 0; i<
        objects.length; i++) {
            for(int j= 0; j< objects[0].length; j++) {
                output[objects.length- i][objects[0].length- j]= objects[i][j];
            }
```

```
        }
        return output;
    }

public static Object[] matrixToArray(Object[][] objects){
              Object[] output= new Object[objects.length* objects[0].length];
              for(int i= 0; i< objects.length; i++) {
                     for(int j= 0; j< objects[0].length; j++) {
                            output[i* objects.length+ j]= objects[i][j];
                     }
              }
              return output;
       }
```

```
package org.deta.tinos.matrix;
import org.deta.tinos.stable.Stable;
public class MatrixValidation{
    public static boolean matrixCheck(Object[][] objects
            , String
        attribute){ if(attribute.equalsIgnoreCase(Stable.STRING
        _BOOLEAN)) {
            for(int i= 0; i< objects.length; i++)
                { for(int j= 0; j< objects[0].length; j++)
                {
                    if(!(objects[i][j] instanceof Boolean))
                        { return false;
                    }
                }
            }
        }
        if(attribute.equalsIgnoreCase(Stable.STRING_INT))
            { for(int i= 0; i<objects.length; i++) {
                for(int j= 0; j<objects[0].length; j++)
                    { if(!(objects[i][j] instanceof Integer))
                    {
                        return false;
                    }
                }
            }
        }
        if(attribute.equalsIgnoreCase(Stable.STRING_LONG))
            { for(int i= 0; i< objects.length; i++) {
                for(int j= 0; j< objects[0].length; j++) {
                    if(!(objects[i][j] instanceof Long))
                        { return false;
                    }
                }
            }
        }
        if(attribute.equalsIgnoreCase(Stable.STRING_DOUBLE))
            { for(int i= 0; i< objects.length; i++) {
```

```
            for(int j= 0; j< objects[0].length; j++)
                { if(!(objects[i][j] instanceof Double))
                {
                    return false;
                }
            }
        }
    }
    if(attribute.equalsIgnoreCase(Stable.STRING_FLOAT))
        { for(int i= 0; i< objects.length; i++) {
            for(int j= 0; j< objects[0].length; j++)
                { if(!(objects[i][j] instanceof Float))
                {
                    return false;
                }
            }
        }
    }
    if(attribute.equalsIgnoreCase(Stable.STRING_STRING))
        { for(int i= 0; i< objects.length; i++) {
            for(int j= 0; j< objects[0].length; j++)
                { if(!(objects[i][j] instanceof String))
                {
                    return false;
                }
            }
        }
    }
    if(attribute.equalsIgnoreCase(Stable.STRING_SHORT))
        { for(int i= 0; i< objects.length; i++) {
            for(int j= 0; j< objects[0].length; j++)
                { if(!(objects[i][j] instanceof Short))
                {
                    return false;
                }
            }
        }
    }
    if(attribute.equalsIgnoreCase(Stable.STRING_BYTE))
        { for(int i= 0; i< objects.length; i++) {
            for(int j= 0; j< objects[0].length; j++)
                { if(!(objects[i][j] instanceof Byte))
                {
                    return false;
                }
            }
        }
    }
    return true;
```

```
}
public static Object[][] matrixFix(Object[][] objects
        , String
    attribute){ if(attribute.equalsIgnoreCase(Stable.STRING
    _BOOLEAN)) {
        for(int i= 0; i< objects.length; i++)
            { for(int j= 0; j< objects[0].length; j++)
            {
                if(!(objects[i][j] instanceof Boolean))
                    { objects[i][j]= false;
                }
            }
        }
    }
    if(attribute.equalsIgnoreCase(Stable.STRING_INT))
        { for(int i= 0; i< objects.length; i++) {
            for(int j= 0; j< objects[0].length; j++)
                { if(!(objects[i][j] instanceof Integer))
                {
                    objects[i][j]= (int)0;
                }
            }
        }
    }
    if(attribute.equalsIgnoreCase(Stable.STRING_LONG))
        { for(int i= 0; i< objects.length; i++) {
            for(int j= 0; j< objects[0].length; j++)
                { if(!(objects[i][j] instanceof Long))
                {
                    objects[i][j]= (long)0;
                }
            }
        }
    }
    if(attribute.equalsIgnoreCase(Stable.STRING_DOUBLE))
        { for(int i= 0; i< objects.length; i++) {
            for(int j= 0; j< objects[0].length; j++)
                { if(!(objects[i][j] instanceof Double))
                {
                    objects[i][j]= (double)0.0;
                }
            }
        }
    }
    if(attribute.equalsIgnoreCase(Stable.STRING_FLOAT))
        { for(int i= 0; i< objects.length; i++) {
            for(int j= 0; j< objects[0].length; j++)
                { if(!(objects[i][j] instanceof Float))
                {
```

```
                        objects[i][j]= (float)0.0;
                    }
                }
            }
        }
        if(attribute.equalsIgnoreCase(Stable.STRING_STRING))
            { for(int i= 0; i< objects.length; i++) {
                for(int j= 0; j< objects[0].length; j++)
                    { if(!(objects[i][j] instanceof String))
                    {
                        objects[i][j]= "";
                    }
                }
            }
        }
        if(attribute.equalsIgnoreCase(Stable.STRING_SHORT))
            { for(int i= 0; i< objects.length; i++) {
                for(int j= 0; j< objects[0].length; j++)
                    { if(!(objects[i][j] instanceof Short))
                    {
                        objects[i][j]= (short)0;
                    }
                }
            }
        }
        if(attribute.equalsIgnoreCase(Stable.STRING_BYTE))
            { for(int i= 0; i< objects.length; i++) {
                for(int j= 0; j< objects[0].length; j++)
                    { if(!(objects[i][j] instanceof Byte))
                    {
                        objects[i][j]= (byte)0;
                    }
                }
            }
        }
        return objects;
    }
}
```

```
package org.deta.tinos.matrix3D;
public class Matrix3DSwap{
    public static Object[][][] matrixShiftSwapXYZ(Object[][][]
        objects){ Object[][][] output
        = new Object[objects[0][0].length][objects.length][objects[0].length];
        for(int i= 0; i< objects.length; i++) {
            for(int j= 0; j< objects[0].length; j++)
                { for(int k= 0; k< objects[0][0].length; k++)
                {
                    output[k][i][j]= objects[i][j][k];
```

```
            }
        }
    }
    return output;
}
public static Object[][][] matrixInclineSwapXY(Object[][][]
    objects){ Object[][][] output
    = new Object[objects[0].length][objects.length][objects[0][0].length];
    for(int i= 0; i< objects.length; i++) {
        for(int j= 0; j< objects[0].length; j++)
            { for(int k= 0; k< objects[0][0].length; k++)
            {
                output[j][i][k]= objects[i][j][k];
            }
        }
    }
    return output;
}
public static Object[][][] matrixInclineSwapXZ(Object[][][]
    objects){ Object[][][] output
    = new Object[objects[0][0].length][objects[0].length][objects.length];
    for(int i= 0; i< objects.length; i++) {
        for(int j= 0; j< objects[0].length; j++)
            { for(int k= 0; k< objects[0][0].length; k++)
            {
                output[k][j][i]= objects[i][j][k];
            }
        }
    }
    return output;
}
public static Object[][][] matrixInclineSwapYZ(Object[][][]
    objects){ Object[][][] output
    = new Object[objects.length][objects[0][0].length][objects[0].length];
    for(int i= 0; i< objects.length; i++) {
        for(int j= 0; j< objects[0].length; j++)
            { for(int k= 0; k< objects[0][0].length; k++)
            {
                output[i][k][j]= objects[i][j][k];
            }
        }
    }
    return output;
}
public static Object[][][] matrixReverseSwap(Object[][][]
    objects){ Object[][][] output= new
    Object[objects.length][objects[0].length][]; for(int i= 0; i<
    objects.length; i++) {
        for(int j= 0; j< objects[0].length; j++)
```

```
            { for(int k= 0; k< objects[0][0].length; k++)
            {
                output[objects.length- i][objects[0].length- j]
                        [objects[0][0].length- k]= objects[i][j][k];
            }
        }
    }
    return output;
}
public static Object[][][] matrixReverseSwapXY(Object[][][]
    objects){ Object[][][] output= new
    Object[objects.length][objects[0].length][]; for(int i= 0; i<
    objects.length; i++) {
        for(int j= 0; j< objects[0].length; j++)
            { for(int k= 0; k< objects[0][0].length; k++)
            {
                output[objects.length- i][objects[0].length- j][k]
                        = objects[i][j][k];
            }
        }
    }
    return output;
}
public static Object[][][] matrixReverseSwapXZ(Object[][][]
    objects){ Object[][][] output= new
    Object[objects.length][objects[0].length][]; for(int i= 0; i<
    objects.length; i++) {
        for(int j= 0; j< objects[0].length; j++)
            { for(int k= 0; k< objects[0][0].length; k++)
            {
                output[objects.length- i][j][objects[0][0].length- k]
                        = objects[i][j][k];
            }
        }
    }
    return output;
}
public static Object[][][] matrixReverseSwapYZ(Object[][][]
    objects){ Object[][][] output= new
    Object[objects.length][objects[0].length][]; for(int i= 0; i<
    objects.length; i++) {
        for(int j= 0; j< objects[0].length; j++)
            { for(int k= 0; k< objects[0][0].length; k++)
            {
                output[i][objects[0].length- j][objects[0][0].length- k]
                        = objects[i][j][k];
            }
        }
    }
```

```
        return output;
    }
    public static Object[] matrixToArray(Object[][][]
        objects){ Object[] output= new Object[objects.length
                                * objects[0].length* objects[0][0].length];
        for(int i= 0; i< objects.length; i++) {
            for(int j= 0; j< objects[0].length; j++)
                { for(int k= 0; k< objects[0][0].length; k++)
                {
                    output[i* objects.length* objects[0].length
                           + j* objects[0].length+ k]= objects[i][j][k];
                }
            }
        }
        return output;
    }
}
```

```
package org.deta.tinos.object;
import com.google.gson.Gson;
public class ObjectSwap{
    public static String objectToJsonString(Gson gson, Object
        object){ return gson.toJson(object);
    }
}
```

```
package org.deta.tinos.stable;
public interface Stable {
    public static final String DOUBLE_INDICATION_NULL= "NULL";
    public static final String DOUBLE_INDICATION_TIVE= "TIVE";
    public static final String SUPPRESS_WARNINGS_DEPRECATION= "deprecation";
    public static final String SUPPRESS_WARNINGS_STATIC_ACCESS= "static-access";
    public static final String INVALID_DOUBLE_FORMAT= "Invalid Double Format!";
    public static final String STRING_EMPTY= "";
    public static final String STRING_PER= ":";
    public static final String STRING_INT= "int";
    public static final String STRING_DOUBLE= "double";
    public static final String STRING_STRING= "string";
    public static final String STRING_FLOAT= "float";
    public static final String STRING_BYTE= "byte";
    public static final String STRING_BOOLEAN= "boolean";
    public static final String STRING_LONG= "long";
    public static final String STRING_SHORT= "short";
    public static final String STRING_BJTIME= "http://www.bjtime.cn";
    public static final String CHARSET_GBK= "GBK";
    public static final String CHARSET= "charset";
    public static final String TYPE= "type";
    public static final String CHARSET_UTF8= "UTF8";
    public static final String CHARSET_UTF_8= "UTF-8";
    public static final String CHARSET_GB2312= "GB2312";
    public static final String CHARSET_ASCII= "ASCII";
```

```
    public static final String CHARSET_UNICODE= "UNICODE";
    public static final String CHARSET_ISO_8859_1= "ISO-8859-1";
    public static final String CONTENT_TYPE= "Content-Type";
    public static final String APPLICATION_XML= "application/xml";
    public static final String APPLICATION_JSON= "application/json";
    public static final String APPLICATION_JSON_UTF8= "application/json;charset=UTF-8";
    public static final String HTTP_POST= "POST";
    public static final String HTTP_GET= "GET";
}
```

```
package org.deta.tinos.stock;
import java.io.BufferedReader;
import java.io.File;
import java.io.FileReader;
import java.io.IOException;
import java.util.ArrayList;
import java.util.List;
import java.util.regex.Matcher;
import java.util.regex.Pattern;
public class StockCode{
    public   List<String>   list;
    public List<String> todayList;
    public void readDBcodeTOList(String code) throws IOException
        { list= new ArrayList<String>();
        File afile
        = new File("StockString.OTOO_STOCK_DB_OLD+code+StockString.OTOO_TXT");
        BufferedReader areader= null;
        String atempString= "StockString.OTOO_EMPTY";
        areader= new BufferedReader(new FileReader(afile));
        while ((atempString= areader.readLine())!= null) {
            if(atempString!= null)
                if(!atempString.equals("StockString.OTOO_EMPTY")){
                    list.add(atempString);
                }
        }
        areader.close();
    }
    public void readTodaycodeTOList() throws IOException
        { todayList= new ArrayList<String>();
        File afile= new File("tockString.STOCK_DB_TODAY");
        BufferedReader areader= null;
        String atempString= "StockString.OTOO_EMPTY";
        areader= new BufferedReader(new FileReader(afile));
        while ((atempString= areader.readLine())!= null) {
            if(atempString!= null)
                if(!atempString.equals("StockString.OTOO_EMPTY")){
                    todayList.add(atempString);
                }
        }
        areader.close();
```

```
    }
    public String readStringTOFormatWithoutCode(String input) throws IOException
        { String output= null;
        Pattern p= Pattern.compile("\"(.*?)\"");
        Matcher m= p.matcher(input); if(m.find())
            if(!m.group(0).equals("\"\"")) {
                output= m.group(0).replace("\"", "");
            }
        return output;
    }
    public String readStringTOFormatWithCode(String input) throws IOException {
        String output= null;
        Pattern p0= Pattern.compile("r_(.*?)=");
        Matcher m0= p0.matcher(input);
        Pattern p= Pattern.compile("\"(.*?)\"");
        Matcher m= p.matcher(input); if(m.find())
            if(!m.group(0).equals("\"\""))
                { if(m0.find()) {
                    output= m0.group(0).replace("r_", "").replace("=", "");
                }
                output+= ","+ m.group(0).replace("\"", "");
            }
        return output;
    }
    public static void main(String [] argv)
            throws IOException, InterruptedException {
        //0to0 a=new 0to0();
    }
}
-----------------------------------------------------------------------------------------------
package org.deta.tinos.string;
import java.util.HashMap;
import java.util.Map;
public class QuickLuoyaoguang4D{
    Map<String, Boolean> find= new HashMap<>();
    public void quick4DStringArray(String[] a, int lp, int rp, int scale)
        { quick4DString(a, lp, rp, 0);
        for(int k= 1; k< scale; k++)
            { quick4DString(a, lp, rp,
            k);
        }
    }
    public void quick4DString(String[] a, int lp, int rp, int scale)
        { if(lp< rp){
            int c= rp- lp; if(c<
                7){ int j;
                for(int i= 1+ lp; i<= lp+ c;
                    i++){ j= i;
                    while(j>= 1+ lp){
```

```
                    if(a[j].length()> scale&& a[j- 1].length()> scale)
                        { if(a[j].toLowerCase().charAt(scale)
                                < a[j-
                            1].toLowerCase().charAt(scale)){ conditionS
                            wap(a, scale, j);
                        }else if(a[j].toLowerCase().charAt(scale)
                                == a[j-1].toLowerCase().charAt(scale))
                            { if(a[j].charAt(scale)< a[j- 1].charAt(scale))
                            {
                                conditionSwap(a, scale, j);
                            }
                        }
                    }
                    j--;
                }
            }
            return;
        }
        int pos= partitionString(a, lp, rp, scale);
        quick4DString(a, lp, pos- 1, scale);
        quick4DString(a, pos+ 1, rp, scale);
    }
}
private void conditionSwap(String[] a, int scale, int j)
    { boolean find= true;
    for(int p= 0; p< scale; p++)
        { if(a[j].charAt(p)!= a[j- 1].charAt(p))
        {
            find= false;
        }
    }
    if(find) {
        String temp= a[j];
        a[j]= a[j-1];
        a[j-1]= temp;
    }
}
private int partitionString(String[] a, int lp, int rp, int scale)
    { String x= a[lp];
    if(!(a[lp].length()<= scale|| a[rp].length()<=
        scale)){ x= a[lp].toLowerCase().charAt(scale)
                < a[rp].toLowerCase().charAt(scale)? a[lp]: a[rp];
    }
    int lp1= lp;
    while(lp1< rp){
        while(innerConditionUp(a, scale, x, lp1,
            rp)){ lp1++;
        }
        while(innerConditionDown(a, scale, x,
```

```
            rp)){ rp--;
        }
        if(lp1< rp){
            boolean find= true;
            for(int p= 0; p< scale; p++)
                { if(a[rp].charAt(p)!= a[lp1].charAt(p))
                {
                    find= false;
                }
            }
            if(find) {
                String temp= a[rp];
                a[rp]= a[lp1];
                a[lp1]= temp;
            }else {
                lp1++;
            }
        }
    }
    if(lp1< rp) {
        a[lp]= a[rp]; a[rp]= x;
    }
    return rp;
}
private boolean innerConditionUp(String[] a, int scale
        , String x, int lp1, int rp)
    { if(lp1>= a.length) {
        return false;
    }
    if(a[lp1].length()<= scale|| x.length()<= scale)
        { return true;
    }
    if(!(a[lp1].toLowerCase().charAt(scale)
            > x.toLowerCase().charAt(scale)|| lp1>= rp))
        { return true;
    }
    return false;
}
private boolean innerConditionDown(String[] a, int scale, String x, int rp)
    { if(rp>= a.length){
        return false;
    }
    if(rp< 0) {
        return false;
    }
    if(a[rp].length()<= scale|| x.length()<= scale)
        { return true;
    }
    if(a[rp].toLowerCase().charAt(scale)
```

```
                > x.toLowerCase().charAt(scale))
            { return true;
        }
        return false;
    }
}
```

```
package org.deta.tinos.string;
public class StringSequency{
    public static String stringToSequency(String
        string){ char[] chars= string.toCharArray();
        for(int i= 0; i< chars.length; i++)
            { for(int j= 0; j< chars.length; j++)
            {
                if(chars[i]< chars[j])
                    { char temp=
                    chars[i];
                    chars[i]= chars[j];
                    chars[j]= temp;
                }
            }
        }
        return String.valueOf(chars);
    }
    public static String[] stringArrayToSequencyArrayIncrement(String[] string
            , int scale){
        //比较头
        for(int i= 0; i< string.length; i++)
            { for(int j= 0; j< string.length; j++)
            {
                //区别字母
                if(string[i].toLowerCase().charAt(0)
                        < string[j].toLowerCase().charAt(0)) {
                    //区别大小写
                    String temp= string[i].toString();
                    string[i]= string[j].toString();
                    string[j]= temp.toString();
                }
            }
        }
        //比较身
        for(int k= 1; k< scale; k++) {
            for(int i= 0; i< string.length; i++)
                { for(int j= 0; j< string.length; j++)
                {
                    if(string[i].length()> k&& string[j].length()> k)
                        { if(string[i].toLowerCase().charAt(k)
                                < string[j].toLowerCase().charAt(k))
                            { boolean find= true;
```

```
                        for(int p= 0; p< k; p++)
                            {  if(string[i].charAt(p)!= string[j].charAt(p))
                            {
                                find= false;
                            }
                        }
                        if(find) {
                            String temp= string[i].toString();
                            string[i]= string[j].toString();
                            string[j]= temp.toString();
                        }
                    }
                }
            }
        }
    }
    return string;
}
public static String[] stringArrayToSequencyArrayDecrement(String[] string
        , int scale){
    //比较头
    for(int i= 0; i< string.length; i++)
        { for(int j= 0; j< string.length; j++)
        {
            //区别字母
            if(string[i].toLowerCase().charAt(0)
                    < string[j].toLowerCase().charAt(0)) {
                //区别大小写
                String temp= string[i].toString();
                string[i]= string[j].toString();
                string[j]= temp.toString();
            }else if(string[i].toLowerCase().charAt(0)
                    == string[j].toLowerCase().charAt(0)) {
                //区别大小写
                if(string[i].charAt(0)<string[j].charAt(0)) {
                    String temp= string[i].toString();
                    string[i]= string[j].toString();
                    string[j]= temp.toString();
                }
            }
        }
    }
    //比较身
    for(int k= 1; k< scale; k++) {
        for(int i= 0; i< string.length; i++)
            { for(int j= 0; j< string.length; j++)
            {
                if(string[i].length()> k&& string[j].length()> k)
                    { if(string[i].toLowerCase().charAt(k)
```

```
                        < string[j].toLowerCase().charAt(k))
                    { boolean find= true;
                    for(int p= 0; p< k; p++)
                        {  if(string[i].charAt(p)!= string[j].charAt(p))
                        {
                            find= false;
                        }
                    }
                    if(find) {
                        String temp= string[i].toString();
                        string[i]= string[j].toString();
                        string[j]= temp.toString();
                    }
                }else if(string[i].toLowerCase().charAt(k)
                        == string[j].toLowerCase().charAt(k)) {
                    //区别大小写
                    if(string[i].charAt(k)<string[j].charAt(k)) {
                        boolean find= true;
                        for(int p= 0; p< k; p++) {
                            if(string[i].charAt(p)!= string[j].charAt(p))
                                { find= false;
                            }
                        }
                        if(find) {
                            String temp= string[i].toString();
                            string[i]= string[j].toString();
                            string[j]= temp.toString();
                        }
                    }
                }
            }
        }
        return string;
    }
}
```

```
package org.deta.tinos.string;
import org.json.XML;
import java.util.List;
import java.util.Map;
import org.json.JSONArray;
import org.json.JSONObject;
import java.io.UnsupportedEncodingException;
import java.math.BigDecimal;
import java.util.ArrayList;
import com.google.gson.Gson;
import org.deta.tinos.json.JsonSwap;
```

```
import org.deta.tinos.stable.Stable;
import com.google.gson.reflect.TypeToken;
@SuppressWarnings(Stable.SUPPRESS_WARNINGS_DEPRECATION)
public class StringSwap{
    public static String stringToJsonObject(Gson gson, String
        string){ return gson.toJson(string);
    }
    public static String stringToXml(Gson gson, String
        string){ JSONObject jSONObject= new
        JSONObject(gson.toJson(string)); return
        XML.toString(jSONObject);
    }
    public static String[] stringToArray(String stopBy, String
        string){ String[] strings= string.split(stopBy);
        return strings;
    }
    public static List<Object> stringToList(Gson gson, String string
            , String key){
        JSONArray jSONArray= XML.toJSONObject(string).getJSONArray(key);
        List<Object> list= new ArrayList<>();
        for(int i= 0; i< jSONArray.length();
            i++){ Object object= jSONArray.get(i);
            if(object instanceof JSONObject){
                list.add(new Gson().fromJson(jSONArray
                                                                                .getJSONObject(i).t
oString(), new TypeToken<Map<String
                            , Object>>(){}.getType()));
            }else if(object instanceof
                String){ list.add(String.valueOf(
                object));
            }else if(object instanceof
                JSONArray){ list.add(JsonSwap.jsonArrayToList(jSONArray.getJSONArray(i)));
            }
        }
        return list;
    }
    public static Map<String, Object> stringToMap(Gson gson, String
        string){ JSONObject jSONObject= new JSONObject(gson.toJson(string));
        return gson.fromJson(jSONObject.toString()
                , new TypeToken<Map<String, Object>>(){}.getType());
    }
    public static String stringToURIencode(String
        string){ return java.net.URLEncoder.encode(string);
    }
    public static String uRIencodeToURIdecode(String
        string){ return java.net.URLDecoder.decode(string);
    }
```

```
    public static int[] stringToCharASCII(String
        string){ int[] charASCII= new
        int[string.length()]; for(int i= 0; i<
        string.length(); i++){
            charASCII[i]= string.charAt(i);
        }
        return charASCII;
    }
    public static String charsetSwap(String string,String inputCharset
            , String outputCharset)
                    throws UnsupportedEncodingException{
        String output= new String(string.getBytes(inputCharset), outputCharset);
        return output;
    }
    public static double stringDoubleToDouble(String stringDouble)
            throws Exception {
        if(stringDouble.toUpperCase().contains(Stable.DOUBLE_INDICATION_NULL)
                || stringDouble.toUpperCase().contains(Stable
                        .DOUBLE_INDICATION_TIVE)) {
            throw new Exception(Stable.INVALID_DOUBLE_FORMAT);
        }
        double output= Double.valueOf(stringDouble);
        return output;
    }
    public static String stringDoubleToBigDecimalRemainder(String stringDouble
            , int newScale) throws Exception
        { if(stringDouble.toUpperCase().contains(Stable.DOUBLE_INDICATION_NULL)
                || stringDouble.toUpperCase().contains(Stable
                        .DOUBLE_INDICATION_TIVE)) {
            throw new Exception(Stable.INVALID_DOUBLE_FORMAT);
        }
        BigDecimal output= new BigDecimal(Double.valueOf(stringDouble))
                .setScale(newScale, BigDecimal.ROUND_HALF_UP);
        return output.toString();
    }
}
```

```
package org.deta.tinos.string;
import java.util.Map;
import org.deta.tinos.stable.Stable;
public class StringValidation{
    public static String stringCodeFilter(String string, String swapSymbol
            , String collection){
        StringBuilder stringBuilder= new StringBuilder();
        for(int i= 0; i< string.length(); i++) {
            if(collection.contains(Stable.STRING_EMPTY+
                string.charAt(i))){ stringBuilder.append(swapSymbol);
            }else {
                stringBuilder.append(string.charAt(i));
```

```
            }
        }
        return stringBuilder.toString();
    }
    public static String stringCodeFilter(String string, String swapSymbol
            , Map<String, Boolean>
        collection){ StringBuilder stringBuilder= new
        StringBuilder(); for(int i= 0; i< string.length();
        i++) {
            if(collection.containsKey(Stable.STRING_EMPTY+
                string.charAt(i))){ stringBuilder.append(swapSymbol);
            }else {
                stringBuilder.append(string.charAt(i));
            }
        }
        return stringBuilder.toString();
    }
}
```

```
package org.deta.tinos.stringBuilder;
import java.util.Map;
import org.json.JSONObject;
import org.json.XML;
import com.google.gson.Gson;
import com.google.gson.reflect.TypeToken;
public class StringBuilderSwap{
    public static char[] stringBuilderToCharArray(StringBuilder stringBuilder)
        { return stringBuilder.toString().toCharArray();
    }
    public static String stringBuilderToString(StringBuilder stringBuilder) {
        return stringBuilder.toString();
    }
    public static String stringBuilderToJson(Gson gson
            , StringBuilder stringBuilder) {
        return gson.toJson(stringBuilder.toString());
    }
    public static String stringBuilderToXml(Gson gson
            , StringBuilder
        stringBuilder){ JSONObject
        jSONObject
        = new JSONObject(gson.toJson(stringBuilder.toString()));
        return XML.toString(jSONObject);
    }
    public static String[] stringBuilderToSplitArray(String stopBy
            , StringBuilder stringBuilder){
        String[] strings= stringBuilder.toString().split(stopBy);
        return strings;
    }
    public static Map<String, Object> stringBuilderToMap(Gson gson
```

```
            , StringBuilder
        stringBuilder){ JSONObject
        jSONObject
        = new JSONObject(gson.toJson(stringBuilder.toString()));
        return gson.fromJson(jSONObject.toString()
                , new TypeToken<Map<String, Object>>(){}.getType());
    }
}
```

```
package org.deta.tinos.tree;
import java.util.Iterator;
import java.util.Map;
import java.util.Set;
import java.util.Vector;
import org.json.JSONObject;
import org.json.XML;
import com.google.gson.Gson;
import com.google.gson.reflect.TypeToken;
public class TreeSwap{
    public static String treeToJsonString(Gson gson, Set<Object>
        sets){ return gson.toJson(sets);
    }
    public static Object stringTreeToJsonString(Gson gson, Set<String> sets)
        { return gson.toJson(sets);
    }
    public static String treeToXml(Gson gson, Set<Object>
        sets){ return XML.toString(new
        JSONObject(gson.toJson(sets)));
    }
    public static String treeToMap(Gson gson, Set<Object> sets){
        return gson.fromJson(new JSONObject(gson.toJson(sets)).toString()
                , new TypeToken<Map<String, Object>>(){}.getType());
    }
    public static Object[] treeToObjectArray(Set<Object>
        sets){ return sets.toArray();
    }
    public static Iterator<Object> treeToIterator(Set<Object>
        sets){ return sets.iterator();
    }
    public static Vector<Object> treeToVector(Set<Object>
        sets){ Vector<Object> vector= new Vector<>();
        Iterator<Object> iterator= sets.iterator();
        while(iterator.hasNext()) {
            vector.add(iterator.next());
        }
        return vector;
    }
}
```

```
package org.deta.tinos.tsp;
import java.util.ArrayList;
import java.util.List;
public class TSP{
    public static int small=1000000000;
    public static void main(String []argv){
        int []x= new int[11];
        int []y= new int[11];
        x[0]= 0;y[0]= 0;
        x[1]= 1;y[1]= 0;
        x[2]= 2;y[2]= 10;
        x[3]= 12;y[3]= 16;
        x[4]= 6;y[4]= 6;
        x[5]= 8;y[5]= 22;
        x[6]= 16;y[6]= 30;
        x[7]= 22;y[7]= 18;
        x[8]= 18;y[8]= 20;
        x[9]= 10;y[9]= 10;
        x[10]= 1;y[10]= 1;
        node first= new node();
        first.x=0;
        first.y=0;
        first.used=0;
        List<node>nodes= new ArrayList<node>();
        findpath(first,x,y,nodes);
        System.out.print(1);
        sort(nodes,first.x,first.y,x.length);
        System.out.print(2);
    }
    public static void sort( List<node> nodes,int x, int y,int
        N){ node temp=nodes.get(nodes.size()-1);
        node temp1=nodes.get(nodes.size()-1);
        System.out.println("the short one");
        node []out=new node[N];
        while(temp!=null){
            out[temp.used]=temp;
            temp=temp.prev;
        }
        while(temp1!=null){ out[te
            mp1.used]=temp1;
            temp1=temp1.next;
        }
        for(int
            i1=0;i1<out.length;i1++){ if(
            out[i1]!=null){
                System.out.println("x:"+out[i1].x+"y:"+out[i1].y);
            }
        }
        System.out.println("the shortest distance:"+out[out.length-1].total_dis);
```

```
}
public static int find(node first,int i,int[] x,int[]
    y){ if(first.x== x[i] && first.y== y[i]){
        return 1;
    }
    node temp= first;
    node temp1= first;
    while(temp.prev!=
        null){ temp=
        temp.prev;
        if(temp.x== x[i]&& temp.y==
            y[i]){ return 1;
        }
    }
    while(temp1.next!=null){
         temp1= temp1.next;
        if (temp1.x== x[i] && temp1.y== y[i])
            { return 1;
        }
    }
    return 0;
}
public static int findSmall(node first,int []x,int
    []y){ while(first.next!=null) {
        first= first.next;
    }
    if(first.x==x[x.length-1]&& first.y==y[y.length-
        1]){ if(first.used==x.length-1){
            if(first.total_dis<small){
                 small=first.total_dis;
                return 1;
            }
            //System.out.println(first.u
        }
    }
    return 0;
}
public static void findpath(node first, int[]x, int[]y, List<node>
    nodes){ for(int i=0;i<x.length;i++){
        node first_copy= new node();
        first_copy.x= first.x;
        first_copy.y= first.y;
        first_copy.used=first.used;
        first_copy.total_dis= first.total_dis;
        first_copy.next=first.next;
        first_copy.prev=first.prev;
        int find= find(first_copy,i,x,y);
        // int findSmall= findSmall(first_copy,i,x,y);
        if(find== 0){
```

```
int findSmall=findSmall(first_copy,x,y);
//if(temp.used>=x.length-2)
//{
//}
node next= new node();
next.x= x[i];
next.y= y[i];
int dis= Math.abs(x[i] - first.x)
        + Math.abs(y[i] - first.y);
next.total_dis= first_copy.total_dis + dis;
next.used= first_copy.used+1;
first_copy.next= next;
next.prev= first_copy;
first_copy= first_copy.next;
findSmall= findSmall(first_copy,x,y);
if(findSmall== 1){
    // small= temp.total_dis;
    // nodes.clear();
    nodes.add(first_copy);
```

```
                    }
                    findpath(first_copy, x, y,nodes);
                    }
            }
        }
}


class node{
    public int
    used= 0;
    public int x;
    public int y;
    public int
    total_dis= 0;
    public node  prev;
    public node  next;
    public int index;
}
```

```
package org.deta.tinos.tsp; import java.util.ArrayList; import java.util.List; public class
TSPEuler{
    public static int small=
    1000000000; public static int
    te= 0;
    public static void main(String[]
        argv){ int []x= new int[41];
        int []y= new
        int[41]; x[0]=
        0;y[0]= 0;
        x[1]= 1;y[1]= 20;
        x[2]= 12;y[2]= 2;
        x[3]= 3;y[3]= 23;
        x[4]= 4;y[4]= 4;
        x[5]= 15;y[5]= 25;
        x[6]= 6;y[6]= 6;
        x[7]= 17;y[7]= 7;
        x[8]= 8;y[8]= 28;
        x[9]= 19;y[9]= 1;
        x[10]= 10;y[10]= 10;
        x[11]= 11;y[11]= 11;
        x[12]= 12;y[12]= 12;
        x[13]= 13;y[13]= 13;
        x[14]= 14;y[14]= 14;
        x[15]= 15;y[15]= 15;
        x[16]= 16;y[16]= 16;
        x[17]= 17;y[17]= 17;
```

```
        x[18]= 18;y[18]= 18;
        x[19]= 19;y[19]= 19;
        x[20]= 20;y[20]= 20;
        x[21]= 21;y[21]= 21;
        x[22]= 22;y[22]= 22;
        x[23]= 23;y[23]= 23;
        x[24]= 24;y[24]= 24;
        x[25]= 25;y[25]= 25;
        x[26]= 26;y[26]= 26;
        x[27]= 27;y[27]= 27;
        x[28]= 28;y[28]= 28;
        x[29]= 29;y[29]= 29;
        x[30]= 30;y[30]= 30;
        x[31]= 31;y[31]= 31;
        x[32]= 32;y[32]= 32;
        x[33]= 33;y[33]= 33;
        x[34]= 34;y[34]= 34;
        x[35]= 35;y[35]= 35;
        x[36]= 36;y[36]= 36;
        x[37]= 37;y[37]= 37;
        x[38]= 38;y[38]= 38;
        x[39]= 39;y[39]= 39;
        x[40]= 1;y[40]= 1;
        /*
       x[41]= 1;y[41]= 1;
/*
        x[42]= 1;y[42]= 1;
      /*
        x[43]= 43;y[43]= 33;
        x[44]= 1;y[44]= 1;
       /*
        x[45]= 45;y[45]= 35;
        x[46]= 46;y[46]= 36;
        x[47]= 47;y[47]= 37;
        x[48]= 48;y[48]= 38;
        x[49]= 49;y[49]= 39;
        x[50]= 1;y[50]= 1;
          */
         node first= new
         node(); first.x=0;
         first.y
         =0;
         first.u
         sed=0;
         List<node>nodes= new
         ArrayList<node>();
         if(x.length>13){
             findpath(first,x,y,nodes);
         }else{
```

```
        findrandom(first,x,y,nodes);
    }
    System.out.print(1);
    sort(nodes,first.x,first.y,x.le
    ngth); System.out.print(2);
}
public static void findrandom(node first, int[]x
        , int[]y, List<node>
    nodes){ int min=999999999;
    int big=0;
    for(int
        i=0;i<x.length;i++){ n
        ode first_copy= new
        node(); first_copy.x=
        first.x; first_copy.y=
        first.y;
        first_copy.used=
        first.used;
        first_copy.total_dis=
        first.total_dis;
        first_copy.next= first.next;
        first_copy.prev= first.prev;
        int find=
        find(first_copy,i,x,y);
        if(find== 0){
            te++;
            node next= new
            node(); next.x=
            x[i];
            next.y= y[i];
            int dis= Math.abs(x[i]- first.x)
                    + Math.abs(y[i]- first.y);
            next.total_dis=
            first_copy.total_dis+ dis;
            next.used= first_copy.used+ 1;
            first_copy.next= next;
            next.prev= first_copy;
            first_copy=
            first_copy.next;
            int findSmall= findSmall(first_copy,
            x, y); if(findSmall== 1){
                nodes.add(first_copy);
            }
            int cc= 0;
            if(first_copy.total_dis
            >big){
                cc+= 1;
                big= first_copy.total_dis;
            }else if(first_copy.total_dis<
```

```
                min){ cc+= 1;
                min= first_copy.total_dis;
            }
            if(cc>0) {
                findrandom(first_copy, x, y, nodes);
            }
        }
    }
}
public static void sort( List<node> nodes,int x, int y,
    int N){ node temp= nodes.get(nodes.size()- 1);
    node temp1=
    nodes.get(nodes.size()- 1);
    System.out.println("the short
    one"); node []out= new node[N];
    while(temp!=
        null){ out[temp.
        used]= temp;
        temp= temp.prev;
    }
    while(temp1!=
        null){ out[temp1.
        used]= temp1;
        temp1= temp1.next;
    }
    for(int i1= 0;i1< out.length;
        i1++){ if(out[i1]!= null){
            System.out.println("x:"+ out[i1].x
                    + "y:"+ out[i1].y);
        }
    }
    System.out.println("the shortest distance:"
            + out[out.length- 1].total_dis);
}
public static int find(node first, int i, int[] x,
    int[] y){ if(first.x== x[i]&& first.y== y[i]){
        return 1;
    }
    node temp=
    first; node
    temp1= first;
    while(temp.prev!=
        null){ temp=
        temp.prev;
        if(temp.x== x[i]&& temp.y==
            y[i]){ return 1;
        }
        if(temp.x== x[x.length- 1]&& temp.y==
            y[y.length- 1]){ if(temp.used!= x.length){
```

```
                return 1;
            }
        }
        if(temp.x== x[0]&& temp.y==
            y[0]){ if(temp.used!=
            0){
                return 1;
            }
        }
    }
    while(temp1.next!=
        null){ temp1=
        temp1.next;
        if (temp1.x== x[i]&& temp1.y==
            y[i]) { return 1;
        }
        if(temp1.x== x[x.length- 1]
                && temp1.y==
            y[y.length-
            1]){ if(temp1.used!=
            x.length){
                return 1;
            }
        }
        if(temp1.x== x[0]&& temp1.y==
            y[0]){ if(temp1.used!= 0){
                return 1;
            }
        }
    }
    if(temp.used!= 0){
        return 1;
    }
    if(temp.x!= x[0]|| temp.y!=
        y[0]){ return 1;
    }
    return 0;
}
public static int findSmall(node first,int []x,int
    []y){ while(first.next!= null) {
        first= first.next;
    }
    if(first.x== x[x.length- 1]&& first.y== y[y.length- 1]){
        if(first.used== x.length-
            1){ if(first.total_di
            s< small){
                small=
                first.total_dis;
                return 1;
```

```
            }
        }
    }
    return 0;
}
public static void findpath(node first, int[]x
        ,  int[]y,  List<node>
    nodes){ int min= 999999999;
    int big= 0;
    for(int i= 0; i< x.length;
        i++){    int    find=
        find(first,i,x,y);
        if(find== 0) {
            int dis= Math.abs(x[i]- first.x)
                    + Math.abs(y[i]-
            first.y); int total_dis=
            first.total_dis+ dis; if
            (total_dis>= big) {
                big= total_dis;
            }
            if (total_dis<=
                min) { min=
                total_dis;
            }
        }
    }
    for(int i= 0; i< x.length;
        i++){ node first_copy=
        new node();
        first_copy.x= first.x;
        first_copy.y= first.y;
        first_copy.used=
        first.used;
        first_copy.total_dis=
        first.total_dis;
        first_copy.next= first.next;
        first_copy.prev= first.prev;
        int find=
        find(first_copy,i,x,y);
        if(find== 0){
            te++;
            node next= new
            node(); next.x=
            x[i];
            next.y= y[i];
            int dis= Math.abs(x[i]- first.x)
                    + Math.abs(y[i]- first.y);
            next.total_dis=
            first_copy.total_dis+ dis;
```

```
                next.used= first_copy.used+ 1;
                first_copy.next= next;
                next.prev= first_copy;
                first_copy=
                first_copy.next;
                int findSmall= findSmall(first_copy,x,y);
                if(findSmall==
                    1){ nodes.add(fi
                    rst_copy);
                }
                int cc=0;
                if(first_copy.total_dis>=
                big*1){
                    cc+= 1;
                    //big=first_copy.total_dis;
                }else
                    if(first_copy.total_dis <=
                        min*1){ cc+= 1;
                        //min=first_copy.total_dis;
                    }
                if(cc>0) {
                    findpath(first_copy, x, y,nodes);
                }
            }//
        }
    }
}
-------------------------------------------------------------------------------------------------
---
package
org.deta.tinos.tsp;
import
java.util.ArrayList;
import java.util.List;
public class YaoguangEulerTSP{
    public   static   int   small=
    1000000000; public static int
    te= 0;
    public  static  void  main(String
        []argv){ int []x= new int[43];
        int []y= new
        int[43]; x[0]=
        0;y[0]= 0;
        x[1]= 1;y[1]= 20;
        x[2]= 12;y[2]= 2;
        x[3]= 3;y[3]= 23;
        x[4]= 4;y[4]= 4;
        x[5]= 15;y[5]= 25;
        x[6]= 6;y[6]= 6;
```

```
        x[7]= 17;y[7]= 7;
        x[8]= 8;y[8]= 28;
        x[9]= 19;y[9]= 1;
        x[10]= 10;y[10]= 10;
        x[11]= 11;y[11]= 11;
        x[12]= 12;y[12]= 12;
        x[13]= 13;y[13]= 13;
        x[14]= 14;y[14]= 14;
        x[15]= 15;y[15]= 15;
        x[16]= 16;y[16]= 16;
        x[17]= 17;y[17]= 17;
        x[18]= 18;y[18]= 18;
        x[19]= 19;y[19]= 19;
        x[20]= 20;y[20]= 20;
        x[21]= 21;y[21]= 21;
        x[22]= 22;y[22]= 22;
        x[23]= 23;y[23]= 23;
        x[24]= 24;y[24]= 24;
        x[25]= 25;y[25]= 25;
        x[26]= 26;y[26]= 26;
        x[27]= 27;y[27]= 27;
        x[28]= 28;y[28]= 28;
        x[29]= 29;y[29]= 29;
        x[30]= 30;y[30]= 30;
        x[31]= 31;y[31]= 31;
        x[32]= 32;y[32]= 32;
        x[33]= 33;y[33]= 33;
        x[34]= 34;y[34]= 34;
        x[35]= 35;y[35]= 35;
        x[36]= 36;y[36]= 36;
        x[37]= 37;y[37]= 37;
        x[38]= 38;y[38]= 38;
        x[39]= 39;y[39]= 39;
        x[40]= 31;y[40]= 21;
        x[41]= 11;y[41]= 21;
        x[42]= 1;y[42]= 1;
        /*
       x[41]= 1;y[41]= 1;
/*
        x[42]= 1;y[42]= 1;
      /*
        x[43]= 43;y[43]= 33;
        x[44]= 1;y[44]= 1;
       /*
        x[45]= 45;y[45]= 35;
        x[46]= 46;y[46]= 36;
        x[47]= 47;y[47]= 37;
        x[48]= 48;y[48]= 38;
        x[49]= 49;y[49]= 39;
```

```
    x[50]= 1;y[50]= 1;
     */
     node first= new
     node(); first.x=
     0;
     first.y= 0;
     first.used= 0;
     List<node>nodes= new
     ArrayList<node>(); if(x.length>
     13&& x.length<= 41){
         findpath(first, x, y, nodes);
     }else if(x.length<=
         13){ findrandom(first, x,
         y, nodes);
     }else{
         findstate(first, x, y, nodes);
     }
     System.out.print(1);
     sort(nodes, first.x, first.y,
     x.length); System.out.print(2);
}
public static void findstate(node first, int[]x
        , int[]y, List<node>
     nodes){ for(int
     i=0;i<x.length;i++){
         //find less 2 node
         int dis[]= new int
         [x.length]; for(int j=
         0;j < x.length;j++){
             dis[j]= Math.abs(x[j] - x[i])
                     + Math.abs(y[j] - y[i]);
         }
         int small= 9999999;
         int f= 0;
         int s= 0;
         int t= 0;
         for(int j= 0; j< dis.length;
             j++){ if(dis[j]< small){
                 small=
                 dis[j];
                 f= j;
             }
         }
         small= 9999999;
         for(int j= 0; j< dis.length;
             j++){ if(dis[j]< small&&
             j!= f){
                 small=
                 dis[j];
```

```
        s= j;
        if(nodes.size()
            ==0){ smal
            l= dis[j];
            s= j;
        }
    }
}
small=9999999;
for(int j=
    0;j<dis.length;j++){ if(dis
    [j]<small&& j!= f&& j!= s){
        small=
        dis[j];
        t= j;
        if(nodes.size()
            ==
            0){ small=
            dis[j]; t=
            j;
        }
    }
}
node n=new
node();
n.x=x[i];
n.y=y[i];
n.index=i;
n.next=new
node();
n.next.x=x[s]
;
n.next.y=y[s]
;
n.next.index
=s;
n.next.prev=
n;
n.prev=new
node();
n.prev.x=x[t]
;
n.prev.y=
y[t];
n.prev.in
dex=t;
n.prev.ne
xt=n;
nodes.add
```

```
        (n);
        //s value=
    }
}
public static void findrandom(node first, int[]x, int[]y
        , List<node>
    nodes){ int min=
    999999999;
    int big= 0;
    for(int i= 0; i<x.length;
        i++){ node first_copy=
        new node();
        first_copy.x= first.x;
        first_copy.y= first.y;
        first_copy.used=
        first.used;
        first_copy.total_dis=
        first.total_dis;
        first_copy.next= first.next;
        first_copy.prev= first.prev;
        int find=
        find(first_copy,i,x,y);
        if(find== 0){
            te++;
            node next= new
            node(); next.x=
            x[i];
            next.y= y[i];
            int dis= Math.abs(x[i] - first.x)
                    + Math.abs(y[i] - first.y);
            next.total_dis= first_copy.total_dis
            + dis; next.used= first_copy.used+1;
            first_copy.next= next;
            next.prev= first_copy;
            first_copy=
            first_copy.next;
            int findSmall=
            findSmall(first_copy,x,y);
            if(findSmall== 1){
                nodes.add(first_copy);
            }
            int cc= 0;
            if(first_copy.total_dis
            >big){
                cc+= 1;
                big= first_copy.total_dis;
            }else if(first_copy.total_dis< min){
                cc+= 1;
                min= first_copy.total_dis;
```

```
            }
            if(cc>0)
                findrandom(first_copy, x, y,nodes);
        }
    }
}
public static void sort( List<node> nodes,int x, int
    y,int N){ if(N> 41){
        for(int i= 0; i< nodes.size();
            i++){ System.out.println(nodes.get(i).prev.x+
            ":"+nodes.get(i).prev.y+
                    "<-"+nodes.get(i).x+ ":"+ nodes.get(i).y+ "->"
                    + nodes.get(i).next.x+ ":"+nodes.get(i).next.y);
        }
        return;
    }
    node temp=
    nodes.get(nodes.size()-1); node
    temp1= nodes.get(nodes.size()-1);
    System.out.println("the short
    one"); node []out= new node[N];
    while(temp!=
        null){ out[temp.
        used]= temp;
        temp= temp.prev;
    }
    while(temp1!=
        null){ out[temp1.
        used]= temp1;
        temp1= temp1.next;
    }
    for(int i1= 0; i1< out.length;
        i1++){ if(out[i1]!= null){
         System.out.println("x:"+ out[i1].x
                 + "y:"+out[i1].y);
        }
    }
    System.out.println("the shortest distance:"
            + out[out.length-1].total_dis);
}
public static int find(node first, int i, int[] x,
    int[] y){ if(first.x== x[i]&& first.y== y[i]){
        return 1;
    }
    node temp=
    first; node
    temp1= first;
    while(temp.prev!=
        null){ temp=
```

```
        temp.prev;
        if(temp.x== x[i]&& temp.y==
            y[i]){ return 1;
        }
        if(temp.x==x[x.length-1]&&
            temp.y==y[y.length-
            1]){ if(temp.used!=x.length){
                return 1;
            }
        }
        if(temp.x==x[0]&&
            temp.y==y[0]){ if(temp.
            used != 0){
                return 1;
            }
        }
    }
    while(temp1.next!=
        null){ temp1=
        temp1.next;
        if (temp1.x== x[i]&& temp1.y==
            y[i]) { return 1;
        }
        if(temp1.x== x[x.length- 1]&& temp1.y==
            y[y.length- 1]){ if(temp1.used!= x.length){
                return 1;
            }
        }
        if(temp1.x== x[0]&& temp1.y==
            y[0]){ if(temp1.used!= 0){
                return 1;
            }
        }
    }
    if(temp.used!= 0){
        return 1;
    }
    if(temp.x!=x[0]||
        temp.y!=y[0]){ return
        1;
    }
    return 0;
}
public static int findSmall(node first, int []x, int
    []y){ while(first.next!=null) {
        first= first.next;
    }
    if(first.x== x[x.length-1]&& first.y==
        y[y.length-1]){ if(first.used== x.length-
```

```
        1){
            if(first.total_dis<sm
                all){ small=
                first.total_dis;
                return 1;
            }
        }
    }
    return 0;
}
public static void findpath(node first, int[]x
        , int[]y, List<node>
    nodes){ int min= 999999999;
    int big= 0;
    for(int i= 0; i< x.length;
        i++){ int find=
        find(first, i, x, y);
        if(find== 0) {
            int dis= Math.abs(x[i]- first.x)
                    + Math.abs(y[i]-
            first.y); int total_dis=
            first.total_dis+ dis; if
            (total_dis>= big) {
                big= total_dis;
            }
            if (total_dis<=
                min) { min=
                total_dis;
            }
        }
    }
    for(int i= 0; i< x.length;
        i++){ node first_copy=
        new node();
        first_copy.x= first.x;
        first_copy.y= first.y;
        first_copy.used=
        first.used;
        first_copy.total_dis=
        first.total_dis;
        first_copy.next= first.next;
        first_copy.prev= first.prev;
        int find= find(first_copy, i,
        x, y); if(find== 0){
            te++;
            node next= new
            node(); next.x=
            x[i];
            next.y= y[i];
```

```
                int dis= Math.abs(x[i]- first.x)
                        + Math.abs(y[i]- first.y);
                next.total_dis=
                first_copy.total_dis+ dis;
                next.used= first_copy.used+ 1;
                first_copy.next= next;
                next.prev= first_copy;
                first_copy=
                first_copy.next;
                int findSmall= findSmall(first_copy,
                x, y); if(findSmall== 1){
                    nodes.add(first_copy);
                }
                int cc= 0;
                if(first_copy.total_dis>=
                big*1){
                    cc+= 1;
                    //big=first_copy.total_dis;
                }else if(first_copy.total_dis<=
                    min*1){ cc+= 1;
                    //min=first_copy.total_dis;
                }
                if(cc> 0) {
                    findpath(first_copy, x, y,nodes);
                }
            }//
        }
    }
}
-------------------------------------------------------------------------------------------------
---
package
org.deta.tinos.txt;
import
java.io.BufferedReader;
import java.io.File;
import
java.io.FileInputStream;
import java.io.IOException;
import java.io.InputStream;
import
java.io.InputStreamReader;
import java.util.ArrayList;
import java.util.List;
public class TXTSwap{
    //注意字节编码的读写正确
    public static Object[][] txtFileToObjectMatrix(String filePath
            , String stopBy) throws
        IOException { Object[][] object=
```

```
    new Object[65535][];
    InputStream inputStream= new FileInputStream(new
    File(filePath)); BufferedReader cReader= new
    BufferedReader(
            new
    InputStreamReader(inputStream));
    String ctempString= null;
    int i= 0;
    while (null!= (ctempString=
        cReader.readLine()))
        { object[i++]=ctempString.split(stopBy);
    }
    cReader.cl
    ose();
    return
    object;
}
public static Object[][] txtFileToObjectMatrixWithRange(String filePath
        , String stopBy, int rangeBegin, int rangeEnd) throws
    IOException { Object[][] object= new Object[rangeEnd-
    rangeBegin][];
    InputStream inputStream= new FileInputStream(new
    File(filePath)); BufferedReader cReader= new
    BufferedReader(
            new
    InputStreamReader(inputStream));
    String ctempString= null;
    int i= 0;
    while (null!= (ctempString=
        cReader.readLine())) { i++;
        if(i<=rangeEnd&& i>= rangeBegin)
            { object[i++]=ctempString.split(
            stopBy);
        }
    }
    cReader.cl
    ose();
    return
    object;
}
public static List<String> txtFileToListStringWithRange(String filePath
        , String stopBy, int rangeBegin, int rangeEnd) throws
    IOException { List<String> list= new ArrayList<>();
    InputStream inputStream= new FileInputStream(new
    File(filePath)); BufferedReader cReader= new
    BufferedReader(
            new
    InputStreamReader(inputStream));
    String ctempString= null;
```

```
    int i= 0;
    while (null!= (ctempString=
        cReader.readLine())) { i++;
        if(i<=rangeEnd&&
            i>=rangeBegin)
            { list.add(ctempString);
        }
    }
    cReader.cl
    ose();
    return
    list;
}
public static List<String> txtFileToListString(String
        filePath) throws IOException {
    List<String> list= new ArrayList<>();
    InputStream inputStream= new FileInputStream(new
    File(filePath)); BufferedReader cReader= new
    BufferedReader(
            new
    InputStreamReader(inputStream));
    String ctempString= null;
    while (null!= (ctempString=
        cReader.readLine()))
        { list.add(ctempString);
    }
    cReader.cl
    ose();
    return
    list;
}
public static List<String[]> txtFileToListStringArray(String filePath
        , String stopBy) throws
    IOException { List<String[]> list=
    new ArrayList<>();
    InputStream inputStream= new FileInputStream(new
    File(filePath)); BufferedReader cReader= new
    BufferedReader(
            new
    InputStreamReader(inputStream));
    String ctempString= null;
    while (null!= (ctempString=
        cReader.readLine()))
        { list.add(ctempString.split(stopBy));
    }
    cReader.cl
    ose();
    return
    list;
```

```
    }
}
-------------------------------------------------------------------------------------------------
---
package org.deta.tinos.vector;



import java.util.ArrayList; import java.util.Iterator; import java.util.LinkedHashMap; import
java.util.List;
import
java.util.Map;
import
java.util.Set;
import
java.util.TreeSet;
import
java.util.Vector;
import
org.deta.tinos.stable.Stable;
import com.google.gson.Gson;
public class VectorSwap{
    public static Map<String, Object>
            vectorToMap( Vector<Object>
            vector){
        Map<String, Object> map= new
        LinkedHashMap<>(); Iterator<Object>
        iterator= vector.iterator(); int i= 0;
        while(iterator.hasNext())
            { map.put(Stable.STRING_EMPTY+ i++,
            iterator.next());
        }
        return map;
    }
    public static List<Object> vectorToList(Vector<Object>
        vector){ List<Object> list= new ArrayList<>();
        Iterator<Object> iterator=
        vector.iterator();
        while(iterator.hasNext()) {
            list.add(iterator.next());
        }
        return list;
    }
    public static Object[] vectorToArray(Vector<Object>
        vector){ return vector.toArray();
    }
    public static Iterator<Object>
            vectorToIterator( Vector<Object>
            vector){
        return vector.iterator();
```

```
    }
    public static String vectorToJsonString(Gson gson
            ,Vector<Object>
        vector){ return
        gson.toJson(vector);
    }
    public static Set<Object> vectorToSet(Vector<Object>
        vector){ Set<Object> sets= new TreeSet<>();
        Iterator<Object> iterator=
        vector.iterator();
        while(iterator.hasNext()) {
            sets.add(iterator.next());
        }
        return sets;
    }
}
-------------------------------------------------------------------------------------------------
---
package
org.deta.tinos.xml;
import org.json.XML;
import
java.util.Map;
import
java.util.Set;
import
java.util.TreeSet;
import
java.util.Vector;
import
java.util.List;
import
java.lang.reflect.Type;
import
java.util.ArrayList;
import
java.util.Hashtable;
import
org.json.JSONArray;
import
org.json.JSONObject;
import
com.google.gson.Gson;
import org.deta.tinos.json.JsonSwap;
import
com.google.gson.reflect.TypeToken;
public class XMLSwap{
    public static List<Object> xmlToList(String string, String key)
        { JSONArray jSONArray=
```

```
    XML.toJSONObject(string).getJSONArray(key); List<Object>
    list= new ArrayList<>();
    for(int i= 0; i< jSONArray.length();
        i++){ Object object=
        jSONArray.get(i); if(object
        instanceof JSONObject){
            list.add(new Gson().fromJson(jSONArray.getJSONObject(i).toString()
                    , new TypeToken<Map<String, Object>>(){}.getType()));
        }else if(object instanceof
            String){ list.add(String.va
            lueOf(object));
        }else if(object instanceof
            JSONArray){ list.add(JsonSwap.jsonArrayToList(jSONArray.getJSONArray(i)));
        }
    }
    return list;
}
public static Vector<Object> xmlToVector(String string, String
    key) { JSONArray jSONArray=
    XML.toJSONObject(string).getJSONArray(key); Vector<Object>
    vector= new Vector<>();
    for(int i= 0; i< jSONArray.length();
        i++){ Object object=
        jSONArray.get(i); if(object
        instanceof JSONObject){
            vector.add(new Gson().fromJson(jSONArray.getJSONObject(i).toString()
                    , new TypeToken<Map<String, Object>>(){}.getType()));
        }else if(object instanceof
            String){ vector.add(String.va
            lueOf(object));
        }else if(object instanceof
            JSONArray){ vector.add(JsonSwap.jsonArrayToList(jSONArray.
            getJSONArray(i)));
        }
    }
    return vector;
}
public static Set<Object> xmlToSets(String string, String key)
    { JSONArray jSONArray=
    XML.toJSONObject(string).getJSONArray(key); Set<Object>
    sets= new TreeSet<>();
    for(int i= 0; i< jSONArray.length();
        i++){ Object object=
        jSONArray.get(i); if(object
        instanceof JSONObject){
            sets.add(new Gson().fromJson(jSONArray.getJSONObject(i).toString()
                    , new TypeToken<Map<String, Object>>(){}.getType()));
        }else if(object instanceof
            String){ sets.add(String.va
```

```
                lueOf(object));
            }else if(object instanceof
                JSONArray){ sets.add(JsonSwap.jsonArrayToList(jSONArray.getJSONArray(i)));
            }
        }
        return sets;
    }
    public Hashtable<String, Object> xmlToHashtable(String xmlString, Gson
        gson){ JSONObject jSONObject= XML.toJSONObject(xmlString);
        Hashtable<String, Object> hashTable= gson.fromJson(jSONObject.toString()
                , (Type) new Hashtable<String,
        Object>()); return hashTable;
    }
}
```