1. *TPSP.java*

```
package TPSP16S2;

import java.util.HashMap;
import java.util.Iterator;
import java.util.Map;
import java.util.Map.Entry;

import Entity.Card;
import Entity.Constants;
import Service.CardService;
import Service.InstructionService;

public class TPSP {

   public static void main(String[] args){

      Constants cons = new Constants(); // set up attractions
//    System.out.println("------------------Theme Park Smart-Pass System------------
-----");

      if(args.length!=4){
         System.out.println("ERROR!Please input right arguments ordered by card
file, instruction file, result file and report file.");
      }else{
         String cardFile = args[0];
         String instructionFile = args[1];
         String resultFile = args[2];
         String reportFile = args[3];

         HashMap<String,Card> cardMap = new HashMap<String,Card>();

         CardService cardService = new CardService();
         cardMap = cardService.readCardFile(cardFile);


         InstructionService instructionService = new InstructionService();
         instructionService.readInstrcutionFile(instructionFile, cardMap,
reportFile);


         cardService.writeCardIntoResultFile(resultFile, cardMap);
      }

   }
}
```

2. *Constants.java*

```
package Entity;

import java.util.HashMap;

/**
 * Initialize Attractions
 * @version 1.0
 *
 */
public class Constants {

   public static final HashMap<String,Attraction> attracMap= new
```

```
HashMap<String,Attraction>();

   public Constants(){
      Attraction spidermanEscape = new Attraction();
      spidermanEscape.setAttractType("Thrill Rides");
      spidermanEscape.setAttractName("Spiderman Escape");
      spidermanEscape.setAge(">=8");
      spidermanEscape.setHeight(">=100");
      attracMap.put("Spiderman Escape", spidermanEscape);

      Attraction iceAgeAdventure = new Attraction();
      iceAgeAdventure.setAttractType("Thrill Rides");
      iceAgeAdventure.setAttractName("Ice Age Adventure");
      iceAgeAdventure.setAge(">=8");
      iceAgeAdventure.setHeight("<=200");
      attracMap.put("Ice Age Adventure", iceAgeAdventure);

      Attraction canyonBlaster = new Attraction();
      canyonBlaster.setAttractType("Thrill Rides");
      canyonBlaster.setAttractName("Canyon Blaster");
      canyonBlaster.setAge(">=8");
      canyonBlaster.setHeight(">=120");
      attracMap.put("Canyon Blaster", canyonBlaster);

      Attraction Theatre = new Attraction();
      Theatre.setAttractType("Family Fun");
      Theatre.setAttractName("4D Theatre");
      Theatre.setAge("none");
      Theatre.setHeight("none");
      attracMap.put("4D Theatre", Theatre);

      Attraction flowRider = new Attraction();
      flowRider.setAttractType("Family Fun");
      flowRider.setAttractName("Flow Rider");
      flowRider.setAge("none");
      flowRider.setHeight(">=100");
      attracMap.put("Flow Rider", flowRider);

      Attraction carousel = new Attraction();
      carousel.setAttractType("Family Fun");
      carousel.setAttractName("Carousel");
      carousel.setAge("none");
      carousel.setHeight("<=100");
      attracMap.put("Carousel", carousel);
   }

}
```

3. *Attration.java*

```
package Entity;

/**
 * Entity class for Attractions
 * @version 1.0
 *
 */
public class Attraction {

   private String attractType;
   private String attractName;
   private String age;
   private String height;
```

```
   public String getAttractType() {
      return attractType;
   }
   public void setAttractType(String attractType) {
      this.attractType = attractType;
   }
   public String getAttractName() {
      return attractName;
   }
   public void setAttractName(String attractName) {
      this.attractName = attractName;
   }
   public String getAge() {
      return age;
   }
   public void setAge(String age) {
      this.age = age;
   }
   public String getHeight() {
      return height;
   }
   public void setHeight(String height) {
      this.height = height;
   }

}
```

4. *InstructionService.java*

```
package Service;

import java.io.BufferedReader;
import java.io.File;
import java.io.FileInputStream;
import java.io.FileWriter;
import java.io.IOException;
import java.io.InputStreamReader;
import java.text.ParseException;
import java.text.SimpleDateFormat;
import java.util.ArrayList;
import java.util.Collections;
import java.util.Comparator;
import java.util.Date;
import java.util.HashMap;
import java.util.Iterator;
import java.util.List;
import java.util.Map;
import java.util.Map.Entry;

import Entity.Attraction;
import Entity.Card;
import Entity.Constants;

/**
 * Class for operations of Instructions
 *
 * @version 2.0
 *
 */
public class InstructionService {

   private InstructionHelper helper = new InstructionHelper();

   public void add(String instruction, HashMap<String, Card> cardMap) {
```

```
      instruction = instruction.substring(4, instruction.length()).trim();
      String[] addInfo = instruction.split(";");
//    String newId = instruction.substring(3, 9); // fatal error

      String newId = addInfo[0].substring(3); // fatal correction!!!!! 1019 lab
      if (cardMap.containsKey(newId)) {// update record

         Card card = cardMap.get(newId);
         helper.updateOrInsertCard(card, addInfo);

      } else {// add new record
         Card card = new Card();
         helper.updateOrInsertCard(card, addInfo);

         cardMap.put(newId, card);
      }
   }



   public void delete(String instruction, HashMap<String, Card> cardMap) {

      String delId = instruction.substring(10, instruction.length());
      if (cardMap.containsKey(delId)) {// delete record
         cardMap.remove(delId);

      } else {// id does not exist
         System.out.println("ERROR!Can not delete ID " + delId
               + " because it does not exist!");
      }
   }




   public void request(String instruction, HashMap<String, Card> cardMap, String
filePath) {
      instruction = instruction.substring(8, instruction.length());
      helper.judgeRequest(instruction, cardMap, filePath);

   }

   // query results and write results to file
   public void query(String queryStr, HashMap<String, Card> cardMap,
         String filePath) {
      if (queryStr.contains("name")) {
         String name = queryStr.substring(11, queryStr.length());
         helper.queryByName(name, cardMap, filePath);

      } else if (queryStr.contains("ID")) {

         String[] queryInfo = queryStr.substring(6, queryStr.length())
               .split(";");
         queryInfo[0] = queryInfo[0].trim();
         queryInfo[1] = queryInfo[1].trim();
         queryInfo[2] = queryInfo[2].trim().substring(3);

         try {
            helper.queryByID(queryInfo, cardMap, filePath);
         } catch (ParseException e) {
            e.printStackTrace();
         }
      } else if (queryStr.contains("age")) {
         String[] queryInfo = queryStr.substring(6, queryStr.length()).split(";");
         queryInfo[0] = queryInfo[0].trim();
```

```
            queryInfo[1] = queryInfo[1].trim();
            helper.queryByAge(queryInfo, cardMap, filePath);
        }
    }



    public void readInstrcutionFile(String instructFilePath,
            HashMap<String, Card> cardMap, String reportFilePath) {
        try {
            String encoding = "utf-8";
            File file = new File(instructFilePath);

            if (file.isFile() && file.exists()) { // make a judgement about if file
exists

                InputStreamReader read = new InputStreamReader(
                        new FileInputStream(file), encoding);
                BufferedReader bufferedReader = new BufferedReader(read);
                String lineTxt = null;

                while ((lineTxt = bufferedReader.readLine()) != null) {

                    if (lineTxt.startsWith("add ")) {
                        add(lineTxt.trim(), cardMap);
                    } else if (lineTxt.startsWith("delete ")) {
                        delete(lineTxt.trim(), cardMap);
                    } else if (lineTxt.startsWith("request ")) {
                        request(lineTxt.trim(), cardMap, reportFilePath);

                    } else if (lineTxt.startsWith("query ")) {
                        query(lineTxt.trim(), cardMap, reportFilePath);

                    }
                }
                read.close();
            } else {
                System.out.println("ERROR!Can not find specified file.");
            }
        } catch (Exception e) {
            System.out.println("ERROR!Error occurs when reading files");
            e.printStackTrace();
        }
    }


}
```

5. *InstructionHelper.java*

```
package Service;

import java.io.FileWriter;
import java.io.IOException;
import java.security.spec.ECField;
import java.text.ParseException;
import java.text.SimpleDateFormat;
import java.util.ArrayList;
import java.util.Collections;
import java.util.Comparator;
import java.util.Date;
import java.util.HashMap;
import java.util.Iterator;
import java.util.List;
```

```java
import java.util.Map;
import java.util.Map.Entry;

import Entity.Attraction;
import Entity.Card;
import Entity.Constants;

public class InstructionHelper {

   public SimpleDateFormat toDateForamt(String biDay) {

      SimpleDateFormat sdf = null;

      if (biDay.contains("-")) {
         sdf = new SimpleDateFormat("dd-MM-yyyy");

      } else if (biDay.contains("/")) {
         sdf = new SimpleDateFormat("dd/MM/yyyy");
      }

      return sdf;
   }

   public int calcuAge(String birthday) {

//    SimpleDateFormat sdf = null;
//
//    if (birthday.contains("-")) {
//       sdf = new SimpleDateFormat("dd-MM-yyyy");
//
//    } else if (birthday.contains("/")) {
//       sdf = new SimpleDateFormat("dd/MM/yyyy");
//    }

      SimpleDateFormat sdf = null;
      sdf = toDateForamt(birthday);

//    if (birthday.isEmpty() || birthday == null) {
//
System.out.println("==========================================================================
=");
//    } else {
//       System.out.println("=======================" + birthday +
"=======================");
//    }

      Date now = new Date();
      int age = 0;
      try {
         Date birthDate = toDateForamt(birthday).parse(birthday);

         long nowTime = now.getTime();
         long birthTime = birthDate.getTime();
         long interval = Math.abs(nowTime - birthTime);
         age = (int) (interval / 1000 / 60 / 60 / 24 / 365);

      } catch (ParseException e) {
         System.out.println("birthday not valid");
      }

      return age;
   }

   public void updateOrInsertCard(Card card, String[] addInfo) { // add
      for (int i = 0; i < addInfo.length; i++) {
```

```
         if (addInfo[i].trim().contains("ID")) {
            card.setId(addInfo[i].trim().substring(3, addInfo[i].trim().length()));
// second arg: 9 or addInfo[i].trim().length() ?
         } else if (addInfo[i].trim().contains("name")) {
            card.setName(addInfo[i].trim().substring(5,
                  addInfo[i].trim().length()));
         } else if (addInfo[i].trim().contains("birthday")) {
            card.setBirthday(addInfo[i].trim().substring(9,
                  addInfo[i].trim().length()));
         } else if (addInfo[i].trim().contains("height")) {
            card.setHeight(addInfo[i].trim().substring(7,
                  addInfo[i].trim().length()));
         } else if (addInfo[i].trim().contains("address")) {
            card.setAddress(addInfo[i].trim().substring(8,
                  addInfo[i].trim().length()));
         }
      }
   }

   public void judgeRequest(String instruction, HashMap<String, Card> cardMap,
String filePath) {
      String content = "";
      String[] requestInfo = instruction.split(";");
      String requestId = requestInfo[0].substring(3, requestInfo[0].length());

      if (cardMap.containsKey(requestId)) {// request
         Card card = cardMap.get(requestId);

         String birthday = card.getBirthday();
         int age = calcuAge(birthday);

         try {
            int height = Integer.valueOf(card.getHeight().substring(0, // error
                  card.getHeight().length() - 2));

            String attracName = requestInfo[1].trim();
            Attraction attrac = Constants.attracMap.get(attracName);
            String ageRequire = attrac.getAge();
            String heightRequire = attrac.getHeight();
            boolean flag = true;

            if (ageRequire.contains(">=")) {
               if (age < Integer.valueOf(ageRequire.substring(2,
                     ageRequire.length()))) {
//                System.out.println("----request " + instruction + "---");
//                System.out.println("Request Denied: " + requestInfo[1]
//                      + " " + requestInfo[2]);
//                System.out.println("Reasons: Age requirement not met");
                  flag = false;

                  content = "----request " + instruction + "---" + "\r\n" +
                        "Request Denied: " + requestInfo[1] + " " + requestInfo[2]
+ "\r\n" +
                        "Reasons: Age requirement not met";

                  System.out.println(content);

                  content += "\r\n---------------------------------------\r\n\n";

               }
            } else if (ageRequire.contains("<=")) {
               if (age > Integer.valueOf(ageRequire.substring(2,
                     ageRequire.length()))) {
//                System.out.println("----request " + instruction + "---");
//                System.out.println("Request Denied: " + requestInfo[1]
//                      + " " + requestInfo[2]);
```

```
//                System.out.println("Reasons: Age requirement not met");
                  flag = false;

                  content = "----request " + instruction + "---" + "\r\n" +
                        "Request Denied: " + requestInfo[1] + " " + requestInfo[2]
+ "\r\n" +
                        "Reasons: Age requirement not met";

                  System.out.println(content);

                  content += "\r\n---------------------------------------\r\n\n";

               }
            }

            if (heightRequire.contains(">=")) {
               if (height < Integer.valueOf(heightRequire.substring(2,
                     heightRequire.length()))) {
//                System.out.println("----request " + instruction + "---");
//                System.out.println("Request Denied: " + requestInfo[1]
//                      + " " + requestInfo[2]);
//                System.out.println("Reasons: Height requirement not met");
                  flag = false;

                  content = "----request " + instruction + "---" + "\r\n" +
                        "Request Denied: " + requestInfo[1] + " " + requestInfo[2]
+ "\r\n" +
                        "Reasons: Height requirement not met";

                  System.out.println(content);

                  content += "\r\n---------------------------------------\r\n\n";

               }
            } else if (heightRequire.contains("<=")) {
               if (height > Integer.valueOf(heightRequire.substring(2,
                     heightRequire.length()))) {
//                System.out.println("----request " + instruction + "---");
//                System.out.println("Request Denied: " + requestInfo[1]
//                      + " " + requestInfo[2]);
//                System.out.println("Reasons: Height requirement not met");
                  flag = false;

                  content = "----request " + instruction + "---" + "\r\n" +
                        "Request Denied: " + requestInfo[1] + " " + requestInfo[2]+
"\r\n" +
                        "Reasons: Height requirement not met";

                  System.out.println(content);

                  content += "\r\n---------------------------------------\r\n\n";
               }
            }

            if (flag) {
               String visitHistory = card.getAttracVisitHistory();
               card.setAttracVisitHistory(visitHistory + "\n" + requestInfo[1]
                     + " " + requestInfo[2]);

            }
         } catch (Exception e) {
            e.getMessage();
         }

      } else {// id does not exist
//       System.out.println("----request " + instruction + "---");
```

```
//        System.out.println("Request Denied: " + requestInfo[1] + " "
//              + requestInfo[2]);
//        System.out.println("Reasons: Request ID does not exist");

          content = "----request " + instruction + "---" + "\r\n" +
                "Request Denied: " + requestInfo[1] + " " + requestInfo[2] + "\r\n"
+
                "Reasons: Request ID does not exist";

          System.out.println(content);
          content += "\r\n----------------------------------------\r\n\n";

       }

       if (content != "") {
          appendContent(filePath, content);
       }
    }


    public void queryByName(String name, HashMap<String, Card> cardMap,
          String filePath) {

       Iterator iter = cardMap.entrySet().iterator();
       String content = "";
       while (iter.hasNext()) {
          Entry entry = (Map.Entry) iter.next();
          String id = (String) entry.getKey();
          Card card = (Card) entry.getValue();
          if (name.equals(card.getName())) {
             content += "----query name " + name + "----\r\n";
             if (card.getAttracVisitHistory() != null) {
                String[] attracHist = card.getAttracVisitHistory().split("#");
                for (int i = 0; i < attracHist.length; i++) {
                   content += attracHist[i] + "\r\n";
                }
             }
             content += "----------------------------------------\r\n";
          }
       }
       appendContent(filePath, content);
    }

    public void queryByID(String[] queryInfo, HashMap<String, Card> cardMap,
          String filePath) throws ParseException {

       SimpleDateFormat sdf = new SimpleDateFormat("dd/MM/yyyy");
       HashMap<String, Integer> visitMap = new HashMap<String, Integer>();

       Iterator iter = cardMap.entrySet().iterator();
       while (iter.hasNext()) {
          Entry entry = (Map.Entry) iter.next();
          String id = (String) entry.getKey();
          Card card = (Card) entry.getValue();
          if (queryInfo[2].equals(card.getId())) {
             if (card.getAttracVisitHistory().contains("-")) {
                card.setAttracVisitHistory(card.getAttracVisitHistory()
                      .replace("-", "/"));
             }
             Date fromDate = null;
             Date toDate = null;
             try {
                fromDate = toDateForamt(queryInfo[0]).parse(queryInfo[0]);
                toDate = toDateForamt(queryInfo[1]).parse(queryInfo[1]);
             } catch (ParseException e) {
                e.printStackTrace();
```

```
            }

            String[] visitHistory = card.getAttracVisitHistory().split("#");
            int num = visitHistory.length;

            for (int i = 0; i < num; i++) {
               if (visitHistory[i].startsWith("4D Theatre")) {
                  visitMap.put(
                        "4D Theatre",
                        getIndex("4D Theatre", visitHistory[i],
                              fromDate, toDate, 11));
               } else if (visitHistory[i].startsWith("Spiderman Escape")) {
                  visitMap.put(
                        "Spiderman Escape",
                        getIndex("Spiderman Escape", visitHistory[i],
                              fromDate, toDate, 16));
               } else if (visitHistory[i].startsWith("Ice Age Adventure")) {
                  visitMap.put(
                        "Ice Age Adventure",
                        getIndex("Ice Age Adventure", visitHistory[i],
                              fromDate, toDate, 16));
               } else if (visitHistory[i].startsWith("Canyon Blaster")) {
                  visitMap.put(
                        "Canyon Blaster",
                        getIndex("Canyon Blaster", visitHistory[i],
                              fromDate, toDate, 14));
               } else if (visitHistory[i].startsWith("Flow Rider")) {
                  visitMap.put(
                        "Flow Rider",
                        getIndex("Flow Rider", visitHistory[i],
                              fromDate, toDate, 11));
               } else if (visitHistory[i].startsWith("Carousel")) {
                  visitMap.put(
                        "Carousele",
                        getIndex("Carousel", visitHistory[i], fromDate,
                              toDate, 9));
               }
            }

            Iterator iterHist = visitMap.entrySet().iterator();
            int totalVisits = 0;
            int mostVisits = 0;
            int secondVisits = 0;

            while (iterHist.hasNext()) {
               Entry entryHist = (Map.Entry) iterHist.next();
               String attracName = (String) entryHist.getKey();
               int index = (int) entryHist.getValue();
               totalVisits += index;
            }

            if (totalVisits != 0) {
               String content = "";
               content += "----query " + queryInfo[0] + "; "
                     + queryInfo[1] + "; ID " + queryInfo[2]
                     + "----\r\n";
               content += "Total visits: " + totalVisits + "\r\n";

               List<Map.Entry<String, Integer>> list = new
ArrayList<Map.Entry<String, Integer>>(
                     visitMap.entrySet());
               Collections.sort(list,
                     new Comparator<Map.Entry<String, Integer>>() {
                        // Order
                        @Override
                        public int compare(Entry<String, Integer> o1,
```

```
                           Entry<String, Integer> o2) {
                        return o2.getValue().compareTo(
                              o1.getValue());
                     }
                  });
            int output = 0;

            for (Map.Entry<String, Integer> mapping : list) {
               if (output == 0) {
                  content += "Most-visited: " + mapping.getKey()
                        + " " + mapping.getValue() + "\r\n";
                  output++;
               } else if (output == 1) {
                  content += "2nd-most-visited: " + mapping.getKey()
                        + " " + mapping.getValue() + "\r\n";
                  output++;
               }
            }

            content += "----------------------------------------\r\n";
            appendContent(filePath, content);
         }
      }
   }

   public int getIndex(String attracName, String visitHistory, Date fromDate,
         Date toDate, int offset) {
      int index = 0;
      SimpleDateFormat sdf = new SimpleDateFormat("dd/MM/yyyy");
      String visitDate[] = visitHistory.substring(offset,
            visitHistory.length()).split(" ");
      for (int j = 0; j < visitDate.length; j++) {
         Date visitDay = null;
         if (visitDate[j].contains("/")) {
            try {
               visitDay = sdf.parse(visitDate[j]);
               if (visitDay.after(fromDate) && visitDay.before(toDate)) {
                  index++;
               }
            } catch (ParseException e) {
               e.printStackTrace();
            }
         }
      }
      return index;
   }

   public void queryByAge(String[] queryInfo, HashMap<String, Card> cardMap,
         String filePath) {
      Iterator iter = cardMap.entrySet().iterator();
      int population = 0;
      SimpleDateFormat sdf = null;
      ArrayList<Integer> ageList = new ArrayList<Integer>();

      while (iter.hasNext()) {
         Entry entry = (Map.Entry) iter.next();
         Card card = (Card) entry.getValue();
         // Calculate age
         int age = calcuAge(card.getBirthday());
         if (card.getAttracVisitHistory() != null) {
            if (card.getAttracVisitHistory().contains("-")) {
               card.setAttracVisitHistory(card.getAttracVisitHistory().replace("-",
"/"));
            }
            Date fromDate = null;
```

```
            Date toDate = null;
            try {
//             fromDate = sdf.parse(queryInfo[0]);
//             toDate = sdf.parse(queryInfo[1]);

               fromDate = toDateForamt(queryInfo[0]).parse(queryInfo[0]);
               toDate = toDateForamt(queryInfo[1]).parse(queryInfo[1]);
            } catch (ParseException e) {
               e.printStackTrace();
            }

            ArrayList<String> visitDateList = new ArrayList<String>();
            String[] visitHistory = card.getAttracVisitHistory().split("#");
            int num = visitHistory.length;
            for (int i = 0; i < num; i++) {
               String[] histSegment = visitHistory[i].split(" ");
               for (int j = 0; j < histSegment.length; j++) {
                  if (histSegment[j].contains("/") || histSegment[j].contains("-"))
{
                     Date visitDay = null;
                     try {
                        visitDay =
toDateForamt(histSegment[j]).parse(histSegment[j]);
                        if (visitDay.after(fromDate)&& visitDay.before(toDate)) {
                           ageList.add(age);
                           population++;
                        }
                     } catch (ParseException e) {
                        e.printStackTrace();
                     }
                  }
               }

            }
         }
      }
      int below8 = 0;
      int over8AndBelow18 = 0;
      int over18AndBelow65 = 0;
      int over65 = 0;

      for (Iterator iterAgeList = ageList.iterator(); iterAgeList.hasNext();) {

         int age = (Integer) iterAgeList.next();
         if (age <= 8) {
            below8++;
         } else if (age > 8 && age <= 18) {
            over8AndBelow18++;
         } else if (age > 18 && age <= 65) {
            over18AndBelow65++;
         } else {
            over65++;
         }
      }

      String content = "";
      if (population > 0) {
         content += "----query " + queryInfo[0] + "; " + queryInfo[1]
               + "; age----" + "\r\nPopulation size: " + population
               + "\r\n" + "Age profile\r\nBelow 8: "
               + ((float) below8 / population) * 100
               + "%\r\nOver 8 and below 18: "
               + ((float) over8AndBelow18 / population) * 100
               + "%\r\nOver 18 and Below 65: "
               + ((float) over18AndBelow65 / population) * 100
               + "%\r\nOver 65: " + ((float) over65 / population) * 100
```

```
                + "%\r\n";
        content += "---------------------------------------\r\n";
        appendContent(filePath, content);

     }

  }

  public static void appendContent(String filePath, String content) {
     try {
        //  Open a file writer, and in mode of appending
        FileWriter writer = new FileWriter(filePath, true);
        writer.write(content);
        writer.close();
     } catch (IOException e) {
        e.printStackTrace();
     }
  }


}
```

6. *CardService.java*

```
package Service;

import java.io.File;
import java.io.FileNotFoundException;
import java.io.FileReader;
import java.io.FileWriter;
import java.io.IOException;
import java.util.HashMap;
import java.util.Iterator;
import java.util.Map;
import java.util.Scanner;
import java.util.Map.Entry;

import Entity.Card;

/**
 * Class for operations of Card
 *
 * @version 1.2
 *
 */
public class CardService {

   public HashMap<String, Card> readCardFile(String filePath) {

      HashMap<String, Card> cardMap = new HashMap<String, Card>();

      try {
         File file = new File(filePath);

         if (file.isFile() && file.exists()) { // make a judgement about if  file
exists

            Scanner sc = null;
            try {
               sc = new Scanner(new FileReader(filePath));
            } catch (FileNotFoundException e) {
               e.printStackTrace();
            }
```

```
            // initialize variables
            String lineTxt = null;
            String address = "";
            String attracHistory = "";
            String id = "";
            String name = "";
            String birthday = "";
            String height = "";

            while ((sc.hasNextLine() && (lineTxt = sc.nextLine()) != null)) {

               if (lineTxt.contains("ID")) {
                  id = lineTxt.substring(3, lineTxt.length());

               } else if (lineTxt.contains("name")) {
                  name = lineTxt.substring(5, lineTxt.length());

               } else if (lineTxt.contains("birthday")) {
                  birthday = lineTxt.substring(9, lineTxt.length());

               } else if (lineTxt.contains("height")) {
                  height = lineTxt.substring(7, lineTxt.length());

               } else if (lineTxt.contains("Spiderman Escape")
                     || lineTxt.contains("Ice Age Adventure")
                     || lineTxt.contains("Canyon Blaster")
                     || lineTxt.contains("4D Theatre")
                     || lineTxt.contains("Flow Rider")
                     || lineTxt.contains("Carousel")) {
                  attracHistory += lineTxt + "#";  // may error

               } else {
                  if (lineTxt.contains("address")) {
                     lineTxt = lineTxt.substring(8, lineTxt.length());

                  }
                  address += lineTxt;  // may error

               }

               if (attracHistory.length() != 0) {
               }

               if (lineTxt.length() == 0 ||!sc.hasNextLine()) {

                  Card card = new Card();
                  card.setId(id.trim());
                  card.setName(name.trim());
                  card.setHeight(height.trim());
                  card.setAddress(address);
                  card.setBirthday(birthday.trim());
                  card.setAttracVisitHistory(attracHistory);

                  cardMap.put(card.getId(), card);

                  address = "";
                  attracHistory = "";
               }

            }
         }
      } catch (Exception e) {
         System.out.println("ERROR! Error occurs when reading files");
         e.printStackTrace();
      }
      return cardMap;
```

```
    }

    public void appendContent(String filePath, String content) {
        try {
            // Open a file writer, but not in mode of appending
            FileWriter writer = new FileWriter(filePath, false);
            writer.write(content);
            writer.close();
        } catch (IOException e) {
            e.printStackTrace();
        }
    }

    public void writeCardIntoResultFile(String filePath, HashMap<String, Card>
cardMap) {

        Iterator iter = cardMap.entrySet().iterator();
        String content = "";
        while (iter.hasNext()) {
            Entry entry = (Map.Entry) iter.next();
            String id = (String) entry.getKey();
            Card card = (Card) entry.getValue();
            content += "ID " + id + "\r\n";
            content += "name " + card.getName() + "\r\n";
            content += "birthday " + card.getBirthday() + "\r\n";
            if (card.getAddress() != null) {
                content += "address " + card.getAddress() + "\r\n";
            }
            if (card.getHeight() != null) {
                content += "height " + card.getHeight() + "\r\n";
            }
            if (card.getAttracVisitHistory() != null) {
                String[] attracHistory = card.getAttracVisitHistory()
                        .split("#");
                for (int k = 0; k < attracHistory.length; k++) {
                    content += attracHistory[k] + "\r\n";
                }
            }
            content += "\r\n";
        }

        appendContent(filePath, content);
    }
}
```

7. *Card.java*

```
package Entity;

/**
 * Entity class of Card
 * @version 1.0
 *
 */
public class Card {

    private String id;
    private String name;
    private String birthday;
    private String height;
    private String address;
    private String attracVisitHistory;

    public String getId() {
```

```
        return id;
    }

    public void setId(String id) {
        this.id = id;
    }

    public String getName() {
        return name;
    }

    public void setName(String name) {
        this.name = name;
    }

    public String getBirthday() {
        return birthday;
    }

    public void setBirthday(String birthday) {
        this.birthday = birthday;
    }

    public String getHeight() {
        return height;
    }

    public void setHeight(String height) {
        this.height = height;
    }

    public String getAddress() {
        return address;
    }

    public void setAddress(String address) {
        this.address = address;
    }

    public String getAttracVisitHistory() {
        return attracVisitHistory;
    }

    public void setAttracVisitHistory(String attracVisitHistory) {
        this.attracVisitHistory = attracVisitHistory;
    }

    public boolean isInfoValid() {
        if (id != null && id != "" &&
              name != null && name != "" &&
              birthday != null && birthday != "" &&
              height != null && height != "" &&
              address != null && address != "") {
            return true;
        } else {
            return false;
        }
    }

}
```