CITY UNIVERSITY OF HONG KONG

Course code & title : CS2312 Problem Solving and Programming

Session : Semester A 2022-23 **Quiz**

Time allowed : 50 minutes

Note:

1. There are **2** questions in this paper. Answer ALL questions. Total: 40 marks.
2. Please provide your answers in page 3-6.
   You may separate pages 1-2 when you start answering the questions.
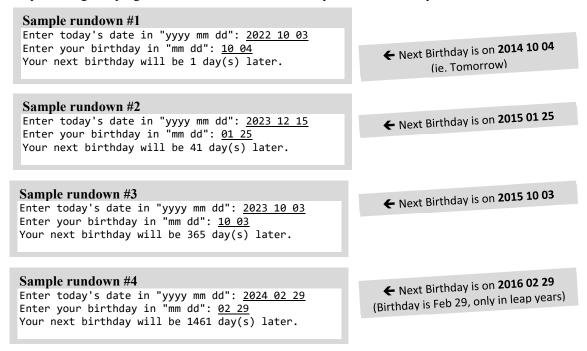   You should submit pages 3-6 only.

Remarks:

1. For all written code required by the questions, you should give precise JAVA code with proper programming styles. Marks may be deducted for redundant or unnecessary code.

2. Apply best practices and skills of **object-oriented programming**.

3. Pay attention to **code design and naming**. **Program execution speed** is **NOT** a major concern**.**
   No need to handle input errors or exceptions unless explicitly mentioned in the question.

4. If your answer is incomplete, you can still get partial marks based on the quality of the answer. Note: Do not remove or change any given code.

*This is a **closed-book** examination.*

> *No materials or aids are allowed during the whole examination.*
> *If any unauthorized materials or aids are found on a candidate during the examination, the candidate will be subject to disciplinary action.*

Q1. Days to wait for birthday [15 marks]

Complete the given program which tells the number of days to **next birthday**.

Sample rundown #1
```
Enter today's date in "yyyy mm dd": 2022 10 03
Enter your birthday in "mm dd": 10 04
Your next birthday will be 1 day(s) later.
```

← Next Birthday is on **2014 10 04**
(ie. Tomorrow)

Sample rundown #2
```
Enter today's date in "yyyy mm dd": 2023 12 15
Enter your birthday in "mm dd": 01 25
Your next birthday will be 41 day(s) later.
```

← Next Birthday is on **2015 01 25**

Sample rundown #3
```
Enter today's date in "yyyy mm dd": 2023 10 03
Enter your birthday in "mm dd": 10 03
Your next birthday will be 365 day(s) later.
```

← Next Birthday is on **2015 10 03**

Sample rundown #4
```
Enter today's date in "yyyy mm dd": 2024 02 29
Enter your birthday in "mm dd": 02 29
Your next birthday will be 1461 day(s) later.
```

← Next Birthday is on **2016 02 29**
(Birthday is Feb 29, only in leap years)

Q2. [File IO]   Vote Counting [25 marks]

(a) [15 marks] Complete the given program which counts the votes stored in a file.

The votes are stored in an input file. Each line contains a name (without space) and the choice: Y or _.
Note: - If a name appears more than once but the choices are consistent, simply ignore the duplicate(s).
         - If a name appears more than once but the choices are inconsistent, output "Error is found"

Sample rundown #1
```
Please enter the filename: c:\v1.txt
Total count of 'Y': 3
```

v1.txt
```
1  Mary Y
2  John _
3  Jack _
4  Joey Y
5  King Y
6  Moon _
```

Sample rundown #2
```
Please enter the filename: c:\v2.txt
Error is found.
```

v2.txt
```
1  Mary Y
2  John _
3  Jack _
4  Joey _
5  King _
6  Moon _
7  Mary _
```

← The name "Mary" appears again but the choices are inconsistent.

Sample rundown #3
```
Please enter the filename: c:\v3.txt
Total count of 'Y': 3
```

v3.txt
```
1  Mary Y
2  John _
3  Jack _
4  Joey Y
5  King Y
6  Moon _
7  Mary Y
```

← The name "Mary" appears again but the choices are consistent.

(b) [10 marks] Please provide the drawing as explained in Page 5.

[Q1] Complete the program below (15 marks):

Given: Day.java

```
public class Day {
    private int year,
    private int month;
    private int day;

    // Constructor
    public Day(int y, int m, int d) {..}

    // Return a string for the day like dd MMM yyyy
    public String toString() {..}

    // Accessor methods
    public int getYear()  {return year;}
    public int getMonth() {return month;}
    public int getDay()   {return day;}

    // Create and return the "next day" of
    // the current day object
    public Day next() {..}

    // Other private methods
    ..
}
```

Main.java

```java
import java.util.*;

public class Main {

    public static void main(String[] args) {

        Scanner in = new Scanner(System.in);

        System.out.print("Enter today's date in \"yyyy mm dd\": ");
        Day dayObj = new Day(in.nextInt(),in.nextInt(),in.nextInt());

        System.out.print("Enter your birthday in \"mm dd\": ");
```

```java
        /* Output */
        System.out.print("Your next birthday will be "+_____+" day(s) later.");

        in.close();
    }
}
```

[Q2 (a)] Complete the program below (15 marks):

Main.java

```java
import java.io.*;
import java.util.*;

public class Main {

  public static void main(String[] args) throws ..
  {
      VoteRecord[] arr;
      arr = new VoteRecord[20]; //Assume max 20 records
      int count=0;

      Scanner in = new Scanner(System.in);

      System.out.print("Please enter the filename: ");
      String filepathname = in.next();

      Scanner inFile;



















  }
}
```

`VoteRecord.java`

```java
public class VoteRecord {

  private String name;
  private boolean choice;

  public VoteRecord(String name, boolean c) {
        this.name = name;
        choice = c;
  }




























}
```

[Q2 (b)] Provide your drawing for the below (10 marks):

Refer to the *Sample rundown #1* of part (a), when the program runs, what will happen to the variable arr **in main()**? Please draw the memory picture to show arr and the array that arr refers to, and the array contents. The contents should involve the objects referred by the array and all *sub-objects* as well.

Note:

* *sub-objects* means the objects that are included (referred via object fields) in the corresponding master objects. For example, a VoteRecord object has the name field, which is a string object that stores the spelling of the name, therefore the name string object is a sub-object of the VoteRecord object.

* For string contents, you may write "..." instead of the complete content. E.g., "Mary", "M...", "..."

Total mark: _____ (/40)

[You may add your answers for any question on this page.]