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ST BENEDICT'S COLLEGE



SUBJECT GRADE EXAMINER NAME CLASS	Information Technology	DATE	July 2016
	11	MARKS	120
	Mrs Kench	MODERATOR	
		DURATION	3 Hours and 30min printing

COGNITIVE LEVELS			
LOW ORDER	32 %	MIDDLE ORDER	38 %
		HIGH ORDER	30 %

INSTRUCTIONS COMMENT	
TEACHER'S SIGNATURE PARENT'S SIGNATURE	

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SECTION A: SQL

QUESTION 1

SQL

40 MARKS

The Divergent series revolves around the adventure of Beatrice "Tris" Prior. Tris lives in a city divided into five factions - Abnegation (selfless), Dauntless (brave), Erudite (knowledge), Amity (peace), and Candor (honesty). In their world, when a boy or girl reaches the age of 16, he or she will undergo certain exams and the result of that exam will determine what faction he or she should belong to although the person ultimately has the final choice. The exams will score, selflessness, bravery, knowledge, peace and honesty on a scale of 1 to 5. After the choosing ceremony the results are stored in a table called tblFaction in a database called Divergent. The person's previous faction and chosen faction is also stored. The date the person joined is the date of the choosing ceremony and is called YearJoined even though the month and day are included in the date.

Table designs

tblFaction

tblFaction	
Field Name	Data Type
ID	AutoNumber
Name	Short Text
BornFaction	Short Text
Chosenfaction	Short Text
YearJoined	Date/Time
Selfless	Number
Brave	Number
Knowledge	Number
Peace	Number
Honesty	Number

Sample of tblFaction

tblFaction										
ID	Name	BornFaction	Chosenfaction	YearJoined	Selfless	Brave	Knowledge	Peace	Honesty	
1	Tris	Abnegation	Dauntless	2010/03/02	5	5	5	5	5	
2	Four	Abnegation	Dauntless	2008/03/02	4	4	4	4	4	
3	Caleb	Abnegation	Erudite	2010/03/02	1	1	5	2	3	
4	Christina	Candor	Dauntless	2010/03/02	2	4	2	1	4	
5	Peter	Candor	Dauntless	2010/03/02	1	4	3	1	1	
6	Will	Erudite	Dauntless	2010/03/02	3	4	3	2	2	
7	Marcus	Abnegation	Abnegation	1987/03/02	2	4	4	1	1	
8	Al	Candor	Dauntless	2010/03/02	3	3	3	3	3	
9	Natalie	Dauntless	Abnegation	1987/03/02	5	5	5	5	5	
10	Andrew	Abnegation	Abnegation	1984/03/02	1	4	3	4	4	
11	Eric	Erudite	Dauntless	2008/03/02	1	5	2	1	1	
12	Janine	Erudite	Erudite	1984/03/02	1	5	4	1	1	
13	Johanna	Amnity	Amnity	1984/03/02	5	2	3	5	4	
14	Jack	Candor	Candor	1987/03/02	2	3	5	2	5	

Perform the following SQL queries using the database and copy your queries to the file called AnswerSheet. Ensure your name is included in the file AnswerSheet.

- 1.1 List all the names and Chosen Faction sorted alphabetically according to Chosen Faction and then the Name. (4)
 - 1.2 List all the people who have scored 5 for bravery and either 5 for knowledge or peace (4)
 - 1.3 Write a SQL statement to count the people in each chosen faction. Rename this field as **FactionCount**. Display the name of the faction and the **FactionCount**. (5)
 - 1.4 Determine the how many years each person has been a member of a faction. Only display those members who have changed factions. (5)
 - 1.5 The data of the choosing day was originally the 1st of June prior to the year 2000. Write a SQL statement to change the date to be the 1st of June is the date is before the year 2000. For example 1987-03-02 must change to 1987-06-01. (6)
 - 1.6 Generate a code for each person. Use the first two letters of their name, the last two letters of their born faction and the second third and fourth letter of their chosen faction. Add the month of the year joined. For example the code for Tris will be 'Tronau3'. (5)
 - 1.7 Insert a new member called Faith who is from Erudite and has chosen to stay in Erudite. Randomly generate each of her exam results. Use today's date for the year joined. (6)
 - 1.8 List the average score for knowledge of each chosen faction, only show the factions whose knowledge is above 3. (5)
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SCENARIO

An avid fan of the Divergent series Trishia has kept a record of some of the details of the factions. She has stored the name of the faction, the first name and surname of the faction leader, the number of people in the faction and the motto of the faction in text file called **Faction.txt**. The fields of the text file are separated by semi colons. (;) Some factions do not have a motto like Divergent and Factionless. The text file is as follows:

Name;first name;surname;total number;motto

```
Candour;Jack;Kang;200;I value honesty above all else.
Abnegation;Marcus;Eaton;250;I choose to turn away from my reflection, to rely not
on myself but on my brothers and sisters, to project always outward until I
disappear
Amnity;Johanna;Reyes;175;Give freely, trusting that you will be given what you
need... Do not be angry. The opinions of others cannot damage you... The wrong is
past. You must let it rest where it lies... You must no longer think cruel
thoughts. Cruel thoughts lead to cruel words, and hurt you as much as they hurt
their target
Dauntless;Four;Eaton;300;We believe in ordinary acts of bravery, in the courage
that drives one person to stand up for another... We believe in shouting for those
who can only whisper, in defending those who cannot defend themselves
Erudite;Janine;Matthews;275;Ignorance is defined not as stupidity but as lack of
knowledge.
Divergent;Tris;Prior;50;;
Factionless;Evelyn;Johnson-Eaton;125;;
```

QUESTION 2

26 MARKS

- 2.1 Create a class called **Faction** with fields to store the **name**, **first name**, **surname**, **total** and the **motto**. Use appropriate types for each field. Use the integer type **long** for the **total** field. (4)
- 2.2 Code a parameterised constructor to assign values to the fields. (3)
- 2.3 Code an accessor method for the **name** field. (2)
- 2.4 Code an accessor and mutator field for the **total** field. Remember that this field is of type **long**. (2)
- 2.5 Code a method called **splitMotto** that will split the motto over more than one line if it is more than 60 characters. When splitting the motto, a word cannot be broken over the line, it must be moved to the next line should be on the threshold of 60 characters.

For example

```
We believe in ordinary acts of bravery, in the courage that drives one
person to stand up for another... We believe in shouting for those who
can only whisper, in defending those who cannot defend themselves
```

(10)

2.6 Code a **toString** method to display each faction as follows:

```
Amnity
Johanna Reyes      Total 175
Motto:
Give freely, trusting that you will be given what you need... Do not be
angry. The opinions of others cannot damage you... The wrong is past.
You must let it rest where it lies... You must no longer think cruel
thoughts. Cruel thoughts lead to cruel words, and hurt you as much as
they hurt their target
```

Use the method **splitMotto** from question 2.4 lay out the motto as shown. Not that there is a tab between the name of the faction leader and the total. (5)

QUESTION 3

46 MARKS

- 3.1 Code a class called **FactionArray** to store 10 Faction objects and a variable to record the number of Faction objects in the array. (5)
- 3.2 Code a constructor to instantiate the array of factions using the text file **Faction.txt**. (8)
- 3.3 Code a **toString** to display each faction separated by a blank line. (5)
- 3.4 Code a method to **sort** the array according to the faction name in alphabetical order. (8)
- 3.5 Code a method to efficiently **search** for a faction given the name of the faction. The method must return the object or null if the object is not found. You may assume that the array is sorted. (8)
- 3.6 At most 20% of the members of a faction are actually divergent. Some however, become Factionless. Code a method that will generate a random number between 1 and 20% of the total number in the faction. Half of these will go to the Divergent faction and half will go to the Factionless. If the number is odd, then the greater number must go to Divergent. For example if 7 is generated, 4 must go to the Divergent faction and 3 must go to Factionless. Code a method called **moveDivergent** that will remove the divergent members from each of the first four factions and split them equally between the Divergent and the Factionless.
Note that the total filed is declared as type **long**. (12)

QUESTION 4

8 MARKS

- 4.1 Code an application class called **FactionUI** to instantiate a **FactionArray** object. (2)
- 4.2 Add code to display all the details of each faction one below the other. (1)
- 4.3 Add code to display all the details of each faction sorted according to the faction name. (1)
- 4.4 Add code to search and display the details of the faction named "Erudite". (2)
- 4.5 Add code to display all the factions after the divergent members have been moved. (2)