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ST BENEDICT'S COLLEGE



SUBJECT	Information Technology	PAPER	Practical Exam
GRADE	11	DATE	July 2018
EXAMINER NAME	Mrs D Kench	MARKS	120
USER NAME		MODERATORS	
PASSWORD		DURATION	3 hours and 30 mins printing

COGNITIVE LEVELS

LOW ORDER	30 %	MIDDLE ORDER	40 %	HIGH ORDER	30 %
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Instructions

- Your name must appear as a comment at the top of each Programming Unit/Class.
- Printing is only required once you have finished the examination. Make sure that programs are saved regularly in the designated directory.
- If your code does not work, comment out the problematic sections. Commented code will still be marked.
- Save your work frequently! In the event of a power failure, extra time will be given equal to the length of the power failure.
- This paper consists of 4 numbered pages. When you are instructed to commence the examination, please check that the paper includes all the pages.

	Q 1	Q 2	Q 3	Q 4	Total
Possible Marks	40	33	42	5	120
Actual Marks					

SECTION A: SQL**40 MARKS**

The files required for this question can be found in the folder named **Section A**. Please complete your work in this folder.

A list of IP addresses have been assigned to Internet Service Provider (ISP) companies in South Africa. Each IP address is in IPV4 format which is four numbers ranging between 0 and 255 separated by a dot. The IP addresses and the details of the company that is assigned the IP address is stored in a database called **IP**. A table called **tblIP** lists the IP address, the total number of IPs assigned to the company, the name of the Internet Service Provider (ISP), the organisation, state (province), city, browser name, Operating System and the date the IP address was assigned. The details of the fields are listed in the table design below:

Table design:

tblIP	
Field Name	Data Type
IPAddress	Short Text
TotalIPs	Number
ISP	Short Text
Organisation	Short Text
State	Short Text
City	Short Text
Browser	Short Text
OperatingSystem	Short Text
AssignDate	Date/Time

A sample of the first 10 records is as follows:

IPAddress	TotalIPs	ISP	Organisation	State	City	Browser	OperatingSystem	AssignDate
154.0.160.87	4096	Afrihost Cloud	Afrihost Cloud	Gauteng				2026/11/07
197.81.192.48	16384	MWEB	MWEB	Gauteng	Centurion			2011/12/09
196.8.131.167	131072	The Standard E	The Standard E	Gauteng	Marshalltown			2025/01/10
41.114.155.50	16384	MTN SA	MTN SA	Western Cape	Cape Town	Chrome 66.0.3	Android, 7.0	2021/01/11
169.0.160.228	8192	Afrihost	Afrihost	KwaZulu-Natal	Durban	Mozilla Firefox	Windows, 7	2021/01/11
105.226.188.16	131072	Telkom Intern	Telkom Intern	Gauteng	Benoni	Chrome 66.0.3	Android, 7.0	2027/05/10
41.13.246.59	262144	Vodacom	Vodacom	Western Cape	Cape Town	Chrome 66.0.3	Android, 8.0.0	2015/11/10
196.15.224.37	4096	Telkom SA Lim	Telkom SA Lim	Orange Free St	Kroonstad	Internet Explo	Windows, 10.0	2015/12/09
165.255.185.18	65536	Axxess Netwo	Afrihost	Western Cape	Cape Town	Chrome 66.0.3	Android, 8.0.0	2018/02/10
160.226.162.11	262144	Cybersmart	Cybersmart	Limpopo	Tzaneen	Edge 16.16299	Windows, 10.0	2001/07/10
80.95.8.60	262144	True Communi	Vangibuzz (Pt)	Province of Nc	Lichtenburg	Chrome 66.0.3	Windows, 10.0	2025/11/09
105.184.132.2	4096	Telkom Intern	Telkom Intern	KwaZulu-Natal	Durban	Chrome 66.0.3	Android, 7.0	2012/01/10

QUESTION 1**40 MARKS**

- 1.1 Display the table **tblIP** sorted alphabetically according to **ISP** then in descending order of **TotalIPs**. (3)

```
SELECT *
FROM tblip
ORDER BY ISP✓, Totalips✓ DESC✓
```

- 1.2 List the name of the organisation that are using either Windows or an Android operating system. (6)

```
SELECT organisation ✓
FROM tblip
WHERE operatingsystem✓ LIKE '%Windows%'✓
OR✓ operatingsystem LIKE ✓'%Android%'✓
```

- 1.3 Delete any record that does not have a value for the **state** field. (3)

```
DELETE
FROM ip.tblip ✓
WHERE state✓ IS NULL✓
```

- 1.4 The date field has been incorrectly interpreted. The date 2026-11-07 should be 26 November 2007. Write a query to show what the date should be in the format yymmdd using either text or date functions combined in a string. Name this new field **NewDate**. A sample of your output should appear as follows:

#	AssignDate	NewDate
1	2026-11-07 00:00:00.0	071126
2	2011-12-09 00:00:00.0	091211
3	2025-01-10 00:00:00.0	100125
4	2021-01-11 00:00:00.0	110121
5	2021-01-11 00:00:00.0	110121
6	2027-05-10 00:00:00.0	100527
7	2015-11-10 00:00:00.0	101115
8	2015-12-09 00:00:00.0	091215
9	2018-02-10 00:00:00.0	100218
10	2001-07-10 00:00:00.0	100701

(6)

```
SELECT AssignDate✓, concat✓ (RIGHT(DATE(assigndate),2), ✓ MID(assigndate, 6,2),
✓MID(assigndate,3,2)) ✓ As NewDate✓
```

```
FROM tblip;
```

- 1.5 Count the number of ISPs in Gauteng. (4)

```
SELECT Count(*) ✓✓
FROM tblip
WHERE state✓ = 'Gauteng'✓
```

- 1.6 List the 10 newest ISPs according to the **AssignDate**. Display the **ISP** and the **AssignDate** fields. (4)

```
SELECT ISP, AssignDate ✓
FROM tblip
ORDER BY ✓Assigndate DESC✓
LIMIT 10✓
```

- 1.7 Calculate the total number of IPs available in each state using the TotalIPs field. Display the state field and the total as a new field called **Total**. Your output should appear as follows: (5)

#	state	Total
1	Eastern Cape	24576
2	Gauteng	1925120
3	KwaZulu-Natal	299008
4	Limpopo	327680
5	Orange Free State	4096
6	Province of North West	266240
7	Western Cape	724992

```
SELECT state, sum(totallps) ✓✓ AS Total✓
FROM tblip
GROUP BY✓ state✓
```

- 1.8 Show the average number of IP addresses assigned to an ISP using the TotalIPs field in each city. Name this new field **Ave** and round your answer to 2 decimal places. Only display those with an average higher than 10 000. Your output should appear as follows:

#	city	Ave
1	Benoni	131072.00
2	Cape Town	59205.82
3	Centurion	16384.00
4	Graaff Reinet	16384.00
5	Johannesburg	171576.89
6	Lichtenburg	262144.00
7	Marshalltown	131072.00
8	Mokopane	65536.00
9	Pietermaritzburg	135168.00
10	Pretoria	25941.33
11	Tzaneen	262144.00
12	Vredendal	65536.00

```
SELECT city, round✓ (avg✓ (totallps✓),2✓) AS Ave
FROM tblip
GROUP ✓BY city✓
HAVING✓ ave✓ > 10000✓
```

(9)

SECTION B

OOP

80 MARKS

QUESTION 2

33 MARKS

//2.1 [4]

```
public class ISP✓
{
```

```
    private✓ String✓ ip; ✓
    private int total;
    private String isp;
    private String date;
```

//2.2 [3]

```
    public ISP✓ (String i, int t, String is, String d) ✓
    {
        ip = i; ✓
        total = t;
        isp = is;
        date = d;
```

//2.5 [1]

```
        date = changeDate();✓
    }
```

//2.6 [4]

```
    @Override
    public String toString()✓
    {
        return✓ ip + "\t" + isp + "\t" + total + "\t" + date; ✓✓
    }
```

//2.3 [4] ✓✓ for accessors and ✓✓ for mutators

```
    public String getIp()
    {
        return ip;
    }
```

//2.4 [9]

```
    public boolean validIP()✓
    {
        boolean temp = false;

        Scanner scIP = new Scanner(ip).useDelimiter("\\.");
        while (scIP.hasNext())✓✓
        {
            int num = scIP.nextInt();✓

            if (num > 255✓ ||✓ num < 0✓)
            {
                return false; ✓
            }
        }
        return true; ✓
    }
```

}

//2.5 [8] + [1]

```

private String changeDate()✓
{
    String [] monthArr = {"January", "February", "March",
    "April", "May", "June","July",
    "August","September","october","November","December"};✓✓
    String year = date.substring(6); ✓
    int month = Integer.parseInt(date.substring(3,5)); ✓
    String day = date.substring(0,2); ✓
    //System.out.println(year + " " + month + " " + day);
    String temp = "20"✓ + year + " " + monthArr[month-1] ✓+ "
    " + day;
    return temp;
}

public int getTotal()
{
    return total;
}

public String getIsp()
{
    return isp;
}

public String getDate()
{
    return date;
}

public void setIp(String ip)
{
    this.ip = ip;
}

public void setTotal(int total)
{
    this.total = total;
}

public void setIsp(String isp)
{
    this.isp = isp;
}

public void setDate(String date)
{
    this.date = date;
}
}

```

QUESTION 3

42 MARKS

//3.1 [4]

```
public class ISPArray✓
{
    private✓ ISP[] ispArr = new ISP[200]; ✓
    private int size = 0; ✓
```

//3.2 [8]

```
public ISPArray()
{
    try
    {
        Scanner scFile = new Scanner(new FileReader("isps.txt"));✓
        String ip, isp, d;
        int t;
        while (scFile.hasNextLine())✓
        {
            String line = scFile.nextLine();✓

            Scanner scLine = new Scanner(line).useDelimiter(",");

            ip = scLine.next();✓
            t = scLine.nextInt();
            isp = scLine.next();
            d = scLine.next();
            ispArr[size] = new ISP(ip, t, isp, d); ✓✓
            size++;✓
        }
        scFile.close();
    } catch (FileNotFoundException ex)
    {
        System.out.println("File not found");✓
    }
}
```

//3.3 [5]

```
public String toString()
{
    String rString = "";
    for (int i = 0; i < size; i++)✓✓
    {
        rString += ispArr[i].toString() + "\n";✓✓
    }

    return rString; ✓
}
```

//3.4 [8]

```
public void sortISP()
{
    for (int i = 0; ✓ i < size - 1; i++)✓
    {
        for (int j = i + 1; ✓ j < size; j++)✓
        {
            if (ispArr[i].getIsp().compareTo✓ (ispArr[j].getIsp()) > 0) ✓

```

```

        {
            ISP temp = ispArr[i]; ✓✓
            ispArr[i] = ispArr[j];
            ispArr[j] = temp;
        }
    }

}

//3.5 [7]
private void ✓shiftKill(int pos) { ✓
    for (int j = pos; j < size - 1; j++) ✓✓ {
        ispArr[j] = ispArr[j + 1]; ✓✓
    }
    size--; ✓
}

//3.6 [10]
public String deleteInvalid()
{
    String temp = "Deleted ISPs:\n"; ✓
    for (int i = 0; i < size; i++) ✓✓
    {
        if(ispArr[i].validIP() ✓ == false) ✓
        {
            temp = temp + ispArr[i].getIsp() ✓ + "\n"; ✓
            shiftKill ✓ (i); ✓
        }
    }
    return temp; ✓
}
}

```

QUESTION 4**5 MARKS**

```

public class IPUI ✓
{
    public static void main(String[] args)
    {
        ISPArray ipa = new ISPArray(); ✓
        System.out.println(ipa); ✓
        ipa.sortISP();
        System.out.println(ipa); ✓

        System.out.println(ipa.deleteInvalid()); ✓
    }
}

```