EXERCISE 9: FILE CLASS
[*LATIHAN 9: KELAS FILE*]

CONCEPT [*KONSEP*]:

1.86 `File` class is used to gather file information, such as its size, whether it is open, its most recent modification date and whether the file exists.
[*Kelas* `File` *digunakan untuk mengumpul maklumat fail, seperti saiznya, adakah ianya sedang dibuka, tarikh perubahan yang terkini dan samada fail tersebut wujud*]

1.87 Java views a file as a series of bytes, and views a stream as an object through which input and output data flow.
[*Java menganggap fail sebagai satu siri byte, dan menganggap aliran sebagai satu objek di mana data input dan output mengalir.*]

1.88 `FileInputStream` and `FileOutputStream` provide the capability to read from and write to files. `InputStream read()` method is used to read in one character at a time
[`FileInputStream` *dan* `FileOutputStream` *membekalkan keupayaan untuk membaca daripada dan menulis ke fail. Metod* `InputStream read()` *digunakan untuk membaca satu aksara pada satu masa.*]

1.89 `DataOutputStream` class can be used to accomplish formatted output. `DataInputStream` objects can be used to read binary data from an `InputStream`.
[*Kelas* `DataOutputStream` *boleh digunakan untuk menghasilkan output berformat. Objek* `DataInputStream` *boleh digunakan untuk membaca data binary daripada* `InputStream`.]

1. Compile and run Program `TestInput2` with the input from the text file as in the following figure. Understand what each line of the statement in the program does. In your own words, explain **why such output is printed.**
[*Kompil dan laksanakan Aturcara* `TestInput2` *dengan memasukkan data daripada fail teks seperti di dalam Rajah berikutnya. Fahamkan apa penyataan pada setiap baris di dalam aturcara tersebut lakukan. Di dalam ayat kamu sendiri, terangkan* ***kenapa hasil tersebut dicetak***.]

```
1  import java.io.*;
2
3  class TestInput2
4  {
5      public static void main(String [] args) throws IOException
6      {
7        BufferedReader reader = new BufferedReader(new
8          FileReader("sample1.txt"));
9
10       PrintWriter writer = new PrintWriter (new
11         FileWriter("write1.txt"));
12
13       String name;
```

```
14          float price;
15
16          //price = new Float(reader.readLine()).floatValue(); OR!
17          price = (Float.valueOf(reader.readLine())).floatValue();
18
19          while (price != 0)
20          {
21                name=reader.readLine();
22                writer.println(price +"\t" + name);
23          //price = new Float(reader.readLine()).floatValue(); OR!
24          price = (Float.valueOf(reader.readLine())).floatValue();
25          }
26          reader.close();
27          writer.close();
28      }
29  }
30
```

Input From Text File
[*Input dari fail teks*]

```
395.95
Television
550.50
Music Centre
1295.00
Desktop Computer
0
```

2. Compile and run Program TestData. Understand the binary file input and output concept. In your own words, explain **why such output is printed**
[*Kompil dan laksanakan Aturcara TestData. Fahamkan konsep fail masukan dan keluar binary. Di dalam ayat kamu sendiri, terangkan* ***kenapa hasil tersebut dicetak.***]

```
1   import java.io.*;
2   class TestData
3   {
4       public static void main(String[]arg) throws IOException
5       {
6         DataOutputStream out = new DataOutputStream(new
7            FileOutputStream("test.txt"));
8         DataInputStream in = new DataInputStream(new
9            FileInputStream("test.txt"));
10
11        out.writeInt(56787);
12        out.writeLong(34567L);
13        out.writeFloat(66.666F);
14        out.writeDouble(678.899);
15        out.writeChar('A');
16        out.writeBoolean(true);
17        out.writeUTF("string");
18        out.close();
19
20        System.out.println(in.readInt());
21        System.out.println(in.readLong());
22        System.out.println(in.readFloat());
```

```
23          System.out.println(in.readDouble());
24          System.out.println(in.readChar());
25          System.out.println(in.readBoolean());
26          System.out.println(in.readUTF());
27          in.close();
28      }
29  }
30
```

EXERCISE 10: PROBLEM SOLVING
[LATIHAN 10: PENYELESAIAN MASALAH]

1. Write a Java program that prints the following quotation. Compile the program using `javac` command and run using `java` command in the DOS environment. You may refer Table 1.1 for appropriate text formatting capability in Java.
[Tulis aturcara Java supaya memaparkan kata-kata hikmah berikut. Kompil aturcara menggunakan arahan `javac` *dan laksanakannya menggunakan arahan* `java` *pada persekitaran DOS. Jadual 1.1 boleh dirujuk untuk memformatkan teks seperti yang dikehendaki.]*

```
THE WAY TO HAPPINESS:
   Keep your heart free from hate,
        your mind from worry,
            live simple, expect little, GIVE MUCH
```

2. Write a Java program that accepts the length and width of a small plot of land in inches from a keyboard, convert them into centimeters and calculate the area. (1 inch = 2.54 cm). Display the length, width and area in a message dialog box.
[Tulis aturcara Java untuk menerima nilai panjang dan lebar sebidang tanah dalam ukuran inci daripada papan kekunci. Tukarkan nilai-nilai berkenaan kepada unit centimeter (1inci = 2.54cm). Paparkan panjang, lebar dan luas dalam satu kekotak mesej.]

3. Write a Java program that compute the temperature in a freezer (in degree Celcius) when the input representing the elapsed time (in hours) since power breakdown using the formula below.
[Tuliskan atur cara Java yang mengira suhu dalam alat sejukbeku apabila input mewakili masa (dalam jam) sejak putusnya bekalan elektrik menggunakan rumus berikut]

$$T = \frac{4t^2}{t+2} - 20$$

where *t* is the time since the power failure. Elapsed time is entered from the keyboard using the `Scanner` class.
[*yang mana t ialah masa ketika bekalan elektrik terputus. Perbezaan masa dimasukkan melalui papan kekunci menggunakan kelas* `Scanner`.]

4. Write a Java program that calculates the Fahrenheit value for a given temperature measured in Celsius. For example, the input 20 would output 68. Use the conversion formula 5(F-32) = 9C. Use console input and output. Format the output to two decimal places
[*Tuliskan satu atur cara Java yang mengira nilai Fahrenheit bagi suhu yang disukat dalam unit Celcius. Sebagai contoh, nilai 20 menghasilkan output 68. Guna rumus* 5(F-32) = 9C. *Guna konsol untuk menerima input dan paparan hasil*]

5. Combine the tasks of converting the input temperature to either degree Celcius or Fahrenheit into one Java program. Based on the user selection either 1 for Fahrenheit, 2 for Celcius and other than that display 'Wrong Choice'. Use selection statements (if/else) to control the flow of the program. For input temperature in Fahrenheit use dialog box to input value and display the results. However for the reverse you may use console input and output.
[*Satukan tugas menukar suhu input kepada sama ada darjah Selsius atau Fahrenheit dalam satu aturcara Java. Berpandukan kepada masukan pengguna, pilihan 1 untuk Fahrenheit, 2 untuk Selsius, pilihan selain daripada itu perlu memaparkan "Wrong Choice". Sila guna pernyataan pilihan untuk mengawal jujukan aturcara. Sila guna kekotak dialog bagi memasukkan data dan memaparkan hasil untuk input dalam darjah Fahrenheit. Disebaliknya sila guna konsol untuk input dan paparan hasil*]

6. Write a Java program to estimate the water flow rate needed for business district fire fighting using the following formula, given the population, P. Use class `JOptionpane` to enter the population of the associated district and to display the water flow rate.
[*Tulis atur cara Java untuk menganggar kadar aliran air yang diperlukan untuk memadamkan kebakaran di kawasan tertentu mengunakan populasi penduduk, P. Gunakan kelas JOptionpane untuk menerima input serta paparan output.*]

$$Q = 3.86\sqrt{P}\,(1\text{-}0.01\sqrt{P}\,)$$

where P is population per thousand
[*yang mana* P *ialah populasi bagi setiap ribu*]

7. Write a complete Java program that compute the shipping charge for a box if the cost per kg is RM20.56. Each box is identified by five digit code and the weight of each box is in kg and gram. Use class `JOptionpane` to enter the input and display the results for 3 boxes.

[*Tuliskan atur cara Java yang lengkap untuk mengira caj penghantaran kotak, sekiranya kos se kg adalah RM20.56. Setiap kotak dikenalpasti oleh lima kod angka dan berat setiap kotak adalah dalam kg dan gram. Gunakan kelas* `JOptionpane` *untuk memasukkan input dan paparkan hasilny bagi 3 kotak.*]

8. Write a Java program for a car rental company that compute the rental charges. The company charges RM150.00 per day plus RM1.00 per kilometer travelled. The company needs the following information ; name of the customer, address, beginning odometer reading, ending odometer reading and the number of days the car is used. Display the kilometers driven, the number of days rented and the total charge imposed. Format the rental charge using two decimal places.
[*Tuliskan atur cara Java untuk syarikat sewa kereta yang mengira bayaran sewaan. Syarikat mengenakan bayaran sebanyak RM15.00 sehari ditambah dengan RM1.00 setiap kilometer perjalanan. Syarikat memerlukan maklumat berikut : nama pelanggan, alamat, bacaan permulaan odometer, bacaan akhir odometer dan bilangan hari kereta digunakan. Paparkan jarak pemanduan dalam kilometer, bilangan hari sewaan dan jumlah bayaran yang dikenakan. Formatkan caj bayaran sewaan dalam dua tempat perpulohan.*]

9. Write a Java program that asks the user to enter the number of item purchased at the stationary's shop. Quantity discounts are given according to the following table. The program should display the amount of discount (if any) and the total amount of the purchase after the discount.
[*Tulis aturcara Java yang meminta pengguna memasukkan bilangan item yang dibeli di kedai alat tulis. Diskaun diberikan bagi kuantiti tertentu mengikut jadual berikut. Aturcara tersebut perlu memaparkan jumlah diskaun (jika ada) dan jumlah amaun bagi pembelian selepas diskaun.*]

Quantity	Discount
10 – 49	10%
50 – 99	20%
100 – 149	30%
150 or more	40%

10. Write a Java program that calculates a customer's monthly bill for the subscription package of the Internet service provider. There are 4 customer's packages as shown in the following table. The program should ask the user to enter the letter of the package type (A, B, C, or D) and the number of hours that were used. It should then display the total charges.
[*Tulis aturcara Java yang mengira bil bulanan pelanggan bagi pakej Penyedia layanan Internet. Terdapat 4 pakej pelanggan seperti jadual berikut. Aturcara meminta pengguna memasukkan huruf bagi jenis pakej (A, B, C atau D) dan bilangan jam digunakan. Aturcara kemudiannya memaparkan jumlah yang perlu dibayar.*]

Package [*Pakej*]	**Charges** [*Bayaran*]
A	Rm10.00 monthly, with 10 hours free internet access and RM2.00 for every additional hour of internet access. [*RM10.00 sebulan menyediakan 10 jam capaian secara percuma. RM2.00 bagi setiap jam tambahan.*]
B	Rm20.00 monthly, with 20 hours free internet access and RM1.50 for every additional hour of internet access. [*RM20.00 sebulan menyediakan 20 jam capaian secara percuma. RM1.50 bagi setiap jam tambahan.*]
C	Rm30.00 monthly, with 30 hours free internet access and RM1.00 for every additional hour of internet access. [*RM30.00 sebulan menyediakan 30 jam capaian secara percuma. RM1.00 bagi setiap jam tambahan.*]
D	Rm50.00 monthly, with 50 hours free internet access and RM0.50 for every additional hour of internet access. [*RM50.00 sebulan menyediakan 50 jam capaian secara percuma. RM0.50 bagi setiap jam tambahan.*]

11. Write a Java program to read from input dialog box the name of 5 tuition teachers and number of hours each of them worked. Assuming they are paid RM30.00 per hour, compute their income for the numbers of hours worked. Display the name of the teacher, hours worked and salary obtained at the console. Use for loop to perform the task.
[*Tulis aturcara Java untuk membaca nama dan jumlah jam bekerja untuk 5 guru tuisyen daripada kekotak mesej input. Mereka dibayar RM30.00 sejam. Kira pendapatan mereka untuk jumlah jam bekerja. Paparkan nama guru tusyen, jumlah jam bekerja dan pendapatan mereka pada kekotak mesej dialog. Sila gunakan gelung for untuk melaksanakan tugas ini*]

12. Write a program to print out the numbers 10 through 49 in the following manner:
[*Tulis atur cara untuk mencetak nombor 10 hingga 49 seperti berikut.*]

```
10 11 12 13 14
15 16 17 18 19
20 21 22 23 24
25 26 27 28 29
30 31 32 33 34
35 36 37 38 39
40 41 42 43 44
45 46 47 48 49
```

13. Write a Java program that uses while loop to read numbers. The numbers should be added and the sum displayed. The loop should ask the user if he or she wishes to perform the operation again. If so, the loop should repeat,

otherwise it should terminate and display the average of the numbers.
[*Tulis aturcara Java yang menggunakan gelung untuk membaca nombor-nombor. Nombor-nombor tersebut perlu ditambah dan paparkan jumlahnya. Gelung tersebut akan bertanya pengguna sama ada beliau hendak mengulangi operasi membaca nombor. Jika ya, gelung akan diulang. Jika sebaliknya, gelung akan ditamatkan dan purata nombor akan dipaparkan.*]

14. Write a Java program that uses nested loop to collect data and calculate the average rainfall over a period of months. First, the program should ask for number of months. The outer loop will iterate once for each month. The inner loop will iterate 4 times, once for each week. Each iteration of the inner loop will ask the user for the centimetres of rainfall for that week. After all iterations, the program should display the number of weeks, the total centimetres of rainfall, and the average rainfall per week for the entire period. For input validation, do not accept a number less than 1 and greater than 12 for the number of months and do not accept negative numbers for the weekly rainfall.
[*Tulis aturcara Java yang menggunakan gelung tersarang untuk mengumpul dan mengira purata hujan dalam tempoh bulan tertentu. Pertama, aturcara perlu bertanya bilangan bulan. Gelung luaran akan berulang satu kali untuk setiap bulan. Gelung dalaman akan berulang sebanyak 4 kali, satu untuk setiap minggu. Setiap ulangan bagi gelung dalaman akan bertanya pengguna mengenai jumlah hujan pada minggu tersebut dalam sentimeter. Setelah semua ulangan, aturcara perlu memaparkan bilangan minggu, jumlah hujan dalam sentimeter, dan purata hujan seminggu bagi tempoh tersebut. Untuk kesahan input, jangan terima nombor kurang dari satu dan lebih besar daripada 12 untuk bilangan bulan dan jangan terima nombor negative bagi hujan seminggu.*]