

# Year 10

## Homework 1: Databases

- 1) What is a relational database? Provide an example.
- 2) Select one of the following six terms related to databases to describe the statements below.

Table	Query	Record
Report	Sorting	Transaction file

- a) A collection of fields related to the same entity.
- b) A temporary file containing recent changes to a database.
- c) A selection of database contents based on certain criteria.
- d) An ordering of the contents of the database.
- e) A printable selection or summary of database contents.
- f) A collection of records.
- 3) A new computerised library system is being designed to replace the old paper-based system of a particular school library.
- a) Define the following terms:
- i) Database
  - ii) Record
  - iii) Field
  - iv) Item
- b) Name two tables you would expect to find in this system.
- c) List three fields you would expect to find in each of the two tables indicated above.
- d) Choose a primary key for each table (it could be mentioned in the fields you gave above).
- e) Suggest a type of access for this application and give a reason for your answer.

## Homework 2: for ... next Loop

Use the for...next loop to produce the following sequences:

- a) 2, 4, 6, ... 18, 20
- b) 1, 4, 7, 10, ...40

- c) 1
- 22
- 333
- 4444
- 55555
- 666666

### Homework 3: Arrays

1) Consider the following one-dimensional array named 'temp'.

0	1	2	3	4	5	6	7	8	9
3	6	-2	0	1	4	7	5	5	-8

- a) What is the value of the following expressions?
  - i) `temp[1] + 3*temp[4]`
  - ii) `temp[2+3] + 10`
- b) What changes are imposed on the array after the following assignment statements?
  - i) `temp[7] = -2;`
  - ii) `temp[4] = temp[4] + 2;`
  - iii) `i = 3;`  
`temp[i] = temp[i] + temp[i+1];`

2) Look at the following program snippet:

```

1 double[] numbers;
2 numbers = new double[10];
3
4 for (int i=0; i<10; i++)
5     numbers[i] = 2*i - 7;
6
7 for (int i=0; i<10; i=i+2)
8     numbers[i] = numbers[i] + numbers[i+1];

```

- a) What is line 1 doing?
  - b) What is happening in line 2?
  - c) How can lines 1 and 2 be written as one line?
  - d) What are the values in array 'numbers' after the execution of line 8?
- 3) A program has array 'ages' of type 'int'. 'ages' is made up of 10 elements. Write code to:
- a) Find the maximum number in 'ages'.
  - b) Checks whether all numbers are not negative.
  - c) Finds the average age.

## Homework 4: Simple Methods

1) Draw the output of the following program.

```
public class SimpleMethods
{
    public static void main (String[] args)
    {
        draw3Lines();
        draw3Lines();
    }

    public static void draw3Lines ()
    {
        System.out.println ("*****");
        System.out.println ("*****-----");
        System.out.println ("*****-----+++++++");
    }
}
```

2) Look at the following incomplete program.

```
public class SimpleMethods2
{
    public static void main (String[] args)
    {
    }

    public static void drawLine6 ()
    {
        System.out.println ("*****");
    }

    public static void drawLine12 ()
    {
        System.out.println ("*****");
    }
}
```

Write the main method if you want the program to display the following:

```
*****
*****
```

\*\*\*\*\*

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3) Draw the output of the following program:

```
class SimpleMethods3
{
    public static void main (String[] args)
    {
        for (int i=1; i<=3; i++)
        {
            if (i==1) one();
            if (i==2) two();
            if (i==3) three();
        }
    }

    public static void one ()
    {
        System.out.println ("one");
    }

    public static void two ()
    {
        System.out.println ("twotwo");
    }

    public static void three ()
    {
        System.out.println ("threethreethree");
    }
}
```