| Please fill in your Student Number and, optionally, Name. | | | | | |
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| Student Number | ÷ | | | | |
| Name | : | | | | |

University of Cape Town ~ Department of Computer Science Computer Science 1015F ~ 2007

Theory Retest 4A

| Question | Mark | Max | Initials |
|----------|------|-----|----------|
| 1 | | 9 | |
| 2 | | 8 | |
| 3 | | 13 | |
| TOTAL | | 30 | |

Marks : 30

Time : 40 minutes

Instructions:

a) Answer all questions.

b) Write your answers in the space provided.

c) Show all calculations where applicable.

Question 1: 1D Arrays. [9]

| a) | write Java code to define an integer array called "data" that contains the following six (6) values: |
|---------|---|
| | -7 -2 -1 -2 1 -1 |
| | Your code should contain a loop that processes these values by adding four (4) to any negative value and making any positive value negative. For example: |
| | -7 -2 -1 -2 1 -1 becomes -3 2 3 2 -1 3 |
| | Finally, print out the final values in order as above. For example, print out -3 2 3 2 -1 3. Your code should work for an array of any size! [6] |
| pu { | blic static void main (String [] args) |
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| } | |
| b) | The final array "data" from Question 1a above contains the values -3 2 3 2 -1 3. Write Java code to print these values out in reverse order by making use of a loop . For example: |
| | -3 2 3 2 -1 3 is printed as 3 -1 2 3 2 -3 [3] |
| | |
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Question 2: 2D Arrays. [8]

Write Java code to set the elements of an array to the values indicated below. Loops must be sensibly used and no value may be read in from a file or the command line. Define all variables used. The code should work for any square array.

| 0 | 0 | 0 | 0 | 0 |
|----|----|----|----|----|
| -1 | 2 | 10 | 10 | 10 |
| -1 | -1 | 4 | 20 | 20 |
| -1 | -1 | -1 | 6 | 30 |
| -1 | -1 | -1 | -1 | 8 |

| public | static | void | main | (String | [] | args) | | |
|--------|--------|------|------|---------|----|-------|--|--|
| { | | | | | | | | |
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| } | | | | | | | | |

Question 3: Classes & Arrays [13]

Complete the two (2) classes given below:

- a) The "Run" class that:
 - 1. "Fills" the array "sales" of the "Value" class.
 - 2. Calls the "colCount" class for each column of the array in turn and then prints out the column number and the value returned which is the number of values in that column which are greater than or equal to zero.

[6]

```
class Run
{
   public static void main (String [] args)
      int count;
      int rowMax = 5;
      int colMax = 7;
      Value y = new Value (rowMax, colMax);
```

```
}
b) Write the "colCount" method of the "Value" class that takes as input the column to be counted and
   returns the number of values greater than or equal to zero in that col of the array.
class Value
{
   private int [][] sales;
    public Value (int rowMax, int colMax) {
    //Constructor already written
   public void Fill () {
    //Already written method that fills the array with values
    }
}
```

}