

1. **Create** a two-dimensional array which has 20 rows and 5 columns.

(5 Marks)

2. **Initialise** each element in the array to a random value in the range 1 – 10. Insure that each random number only appears once in every row and that only ODD numbers are stored at ODD row indexes in the array and that EVEN numbers are stored at EVEN row indexes (including 0) in the array.

(35 Marks)

3. **Print** the array to the screen (in columns of 5).

(10 Marks)

4. You must then **raise each number in the array to the power of the number that follows it** (succeeds it) in the array. The last number in the array (which has no succeeding number) must be raised to the power of the first number in the array.

(40 Marks)

5. **Print** the array to the screen (in columns of 5).

(10 Marks)

The output for the program should look something like the following:

run:

Orginal Array

4	5	8	3	6
8	3	6	7	4
6	9	2	7	8
2	7	6	9	4
2	7	8	3	6
6	3	10	5	4
4	3	2	5	10
4	1	10	9	2
8	5	6	3	10
10	3	6	9	8
6	5	10	3	2
8	5	2	7	6
8	9	6	1	4
6	7	2	3	10
8	9	4	1	2
4	5	2	7	8
2	9	6	5	8
8	7	10	9	6
10	7	8	1	2
8	9	6	5	4

Each Value Raised to the Power of its Successor

1024	390625	512	729	1679616
512	729	279936	2401	4096
10077696	81	128	5764801	64
128	117649	10077696	6561	16
128	5764801	512	729	46656
216	59049	100000	625	256
64	9	32	9765625	10000
4	1	1000000000	81	256
32768	15625	216	59049	10000000000
1000	729	10077696	43046721	262144
7776	9765625	1000	9	256
32768	25	128	117649	1679616
134217728	531441	6	1	4096
279936	49	8	59049	100000000
134217728	6561	4	1	16
1024	25	128	5764801	64
512	531441	7776	390625	16777216
2097152	282475249	1000000000	531441	60466176
10000000	5764801	8	1	256
134217728	531441	7776	625	256

**It may prove difficult to align the (very large) numbers in to columns the second time you print the array. This is ok (as long as each row has five columns) – we will shortly look at ways to solve this problem in class.*

**Use Math.pow(x,y) to help you with part 4 of this exercise. For example:*

```
double d1 = Math.pow(4,2); //d1 will have a value of 16.0
```

```
double d2 = Math.pow(3,3); //d2 will have a value of 27.0
```

```
double d3 = Math.pow(8,4); //d3 will have a value of 4096.0
```

In other words, Math.pow(x,y) will raise x to the power of y and return the answer as a double.