Practical IB Computer Science Practice Challenge—Multiplication Tables

Name: _____ Date: [ ]

This program will display the multiplication tables of a positive integer.

Work through the test from the beginning. Your program should build and grow –do not start a new program for each point. During this test, you may use any resources that you have created or provided to you by the teacher, but do **not** use Internet.
Submit your Java source code file to the corresponding online homework entry before the end of the period. Good luck!
Advice: Save and submit your test as soon as you complete the first few instructions!

Instructions	***Display Output***
1. Output your name on the screen.	**(Your name)**
2. Input an (integer) number.	`Enter an integer between 1 and 9: 5`
3. Output a warning message if the number is less than 1 or greater than 9 and exit the program.	`Enter an integer between 1 and 9: -3` ***Error-number out of range.***
4. Reject invalid inputs. Ask the user to input another number until the input is valid.	`Enter an integer between 1 and 9: -9` ***Error- Enter an integer between 1 and 9:*** **10** ***Error- Enter an integer between 1 and 9:*** **9**
5. Calculate the multiplication table of the input number and numbers 1 to 20 and output the result on the screen.	`Enter an integer between 1 and 9: 9`
6. Align the numbers from 1 to 20, to the right. **Note** that **. . .** is used to save space; your screen output should show all 20 multiplications.	
7. Align the product (result) to the right as well. Ideal, complete output is shown →	

(5)

9 x 1 = 9
9 x 2 = 18
9 x 3 = 27
9 x 4 = 36
9 x 5 = 45
9 x 6 = 54
9 x 7 = 63
9 x 8 = 72
9 x 9 = 81
9 x 10 = 90
9 x 11 = 99
9 x 12 = 108
9 x 13 = 117
9 x 14 = 126
9 x 15 = 135
9 x 16 = 144
9 x 17 = 153
9 x 18 = 162
9 x 19 = 171
9 x 20 = 180

(6)

9 x 1 = 9
9 x 2 = 18
9 x 3 = 27
9 x 4 = 36
9 x 5 = 45
9 x 6 = 54
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(7)

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[Please turn over]

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8. Calculate and output the multiplication tables from 1 up to the number input.

9. Output a line (12 dashes/minus signs or similar) between the table for one number and the next.

   Note that **. . .** is used to save space; your screen output should show all 20 multiplications for each number, from 1 up to and including the input number. Mind the alignment, too.

```
Enter a number between 1 and 9: 9
```

```
          (8)
     1 x  1 =   1
        . . .
     1 x 20 =  20
     2 x  1 =   2
        . . .
     2 x 20 =  40
     3 x  1 =   3
        . . .
     3 x 20 =  60
     4 x  1 =   4
        . . .
     4 x 20 =  80
     5 x  1 =   5
        . . .
     5 x 20 = 100
     6 x  1 =   6
        . . .
     6 x 20 = 120
     7 x  1 =   7
        . . .
     7 x 20 = 140
     8 x  1 =   8
        . . .
     8 x 20 = 160
     9 x  1 =   9
     9 x  2 =  18
     9 x  3 =  27
     9 x  4 =  36
     9 x  5 =  45
     9 x  6 =  54
     9 x  7 =  63
     9 x  8 =  72
     9 x  9 =  81
     9 x 10 =  90
     9 x 11 =  99
     9 x 12 = 108
     9 x 13 = 117
     9 x 14 = 126
     9 x 15 = 135
     9 x 16 = 144
     9 x 17 = 153
     9 x 18 = 162
     9 x 19 = 171
     9 x 20 = 180
```

```
          (9)
     1 x  1 =   1
        . . .
     1 x 20 =  20
     ------------
     2 x  1 =   2
        . . .
     2 x 20 =  40
     ------------
     3 x  1 =   3
        . . .
     3 x 20 =  60
     ------------
     4 x  1 =   4
        . . .
     4 x 20 =  80
     ------------
     5 x  1 =   5
        . . .
     5 x 20 = 100
     ------------
     6 x  1 =   6
        . . .
     6 x 20 = 120
     ------------
     7 x  1 =   7
        . . .
     7 x 20 = 140
     ------------
     8 x  1 =   8
        . . .
     8 x 20 = 160
     ------------
     9 x  1 =   9
     9 x  2 =  18
     9 x  3 =  27
     9 x  4 =  36
     9 x  5 =  45
     9 x  6 =  54
     9 x  7 =  63
     9 x  8 =  72
     9 x  9 =  81
     9 x 10 =  90
     9 x 11 =  99
     9 x 12 = 108
     9 x 13 = 117
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     9 x 17 = 153
     9 x 18 = 162
     9 x 19 = 171
     9 x 20 = 180
     ------------
```

10. Allow the user to repeat (keep calculating tables) while the number input is **not zero**.

```
Enter an integer between 1 and 9: 0
```