P17 (E4 Group)

Define the function d(n) to be the sum of all the positive factors of a given positive integer n,

including 1 and n. We call a number n, a 'mk perfect number' if for d(…(d(d(n))…) = kn for given k and
←m times→
m.

Example: n = 14 is a mk perfect number for m=3 and k=12 as follows. d(n = 14) = 1 + 7 + 2 + 14 = 24.

Then d(24) = 1 + 2 + 3 + 4 + 6 + 8 + 12 + 24 = 60. Next, d(60) = 1 + 2 + 3 + 4 + 5 + 6 + 10 + 12 + 15 + 20

+ 30 + 60 = 168. This means, d(d(d(n = 14))) = 168 = 12*14 = kn where m = 3.

Develop a python program to output the largest mk perfect number below a given integer p input from a file. The output should be displayed on screen and written to a file named "Output.txt". Input file name is given as command line input. The output should also be displayed on screen.

Special requirement: You must define at least 2 functions and use them in your code

Format:
Input: input_file

Each line of the input file contains a positive integer p followed by integers m and k, separated by spaces)

Output: Display on screen and write to the output file named "Output txt' the largest mk-perfect number below the given integer p in each line of the input file. Each output number should appear on a separate line.

Case 1

input: test_data1.txt
Contents: 20 2 2
100 3 12
1000 2 10

Output: Output.txt and on screen
Contents: 16
14
504