

# 8.3D: Writing a Multi-Task Server Application

## Tasks

This task is to create a server application that can serve dynamic pages based on the path information it is given.

In this example, the page should serve the table for the *Power  $n$*  sequence **but** depending on the additional path information it will show the values for a different **base number** (instead of the default 2) and also how many values are shown (the number of iterations in the loop).

For example the following web addresses should hadnled by the code:

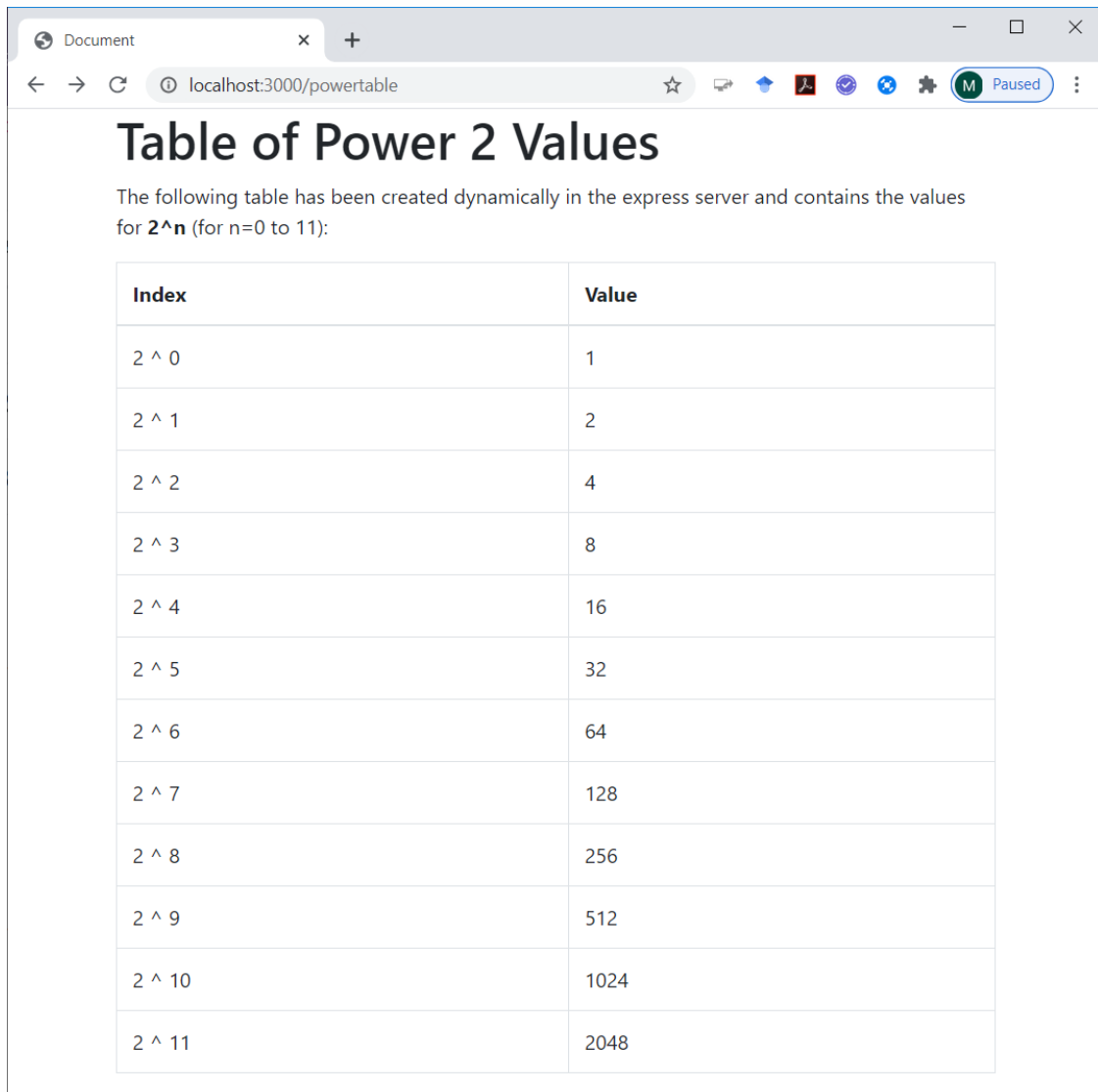
- localhost:8080/powertable
- localhost:8080/powertable/7
- localhost:8080/powertable/7/20
- localhost:8080/powertable/3/50

Follow the steps below to complete this task:

1. Create your own local directory (or you can use the same local directory created in Task 8.1).
2. Use express module to create a Node.js application (i.e., `multitaskServer.js`) that will set a local web server. The server listens to the port **8080**, and
  - When the user accesses `http://localhost:8080/powertable` using a web browser, the *Power 2* table is displayed.
  - When the user accesses `http://localhost:8080/powertable/7` using a web browser, the *Power 7* table is displayed (or what ever the number in the URL is) for the default **12** iterations.
  - When the user accesses `http://localhost:8080/powertable/7/20` using a web browser, the *Power 7* table is displayed (or what ever the first number in the URL is) for the **20** iterations (or what ever the second number in the URL is).
3. Run the command `node multitaskServer.js` in a Command Prompt (Windows)

or Terminal (Mac OS) within your local directory to start the server.

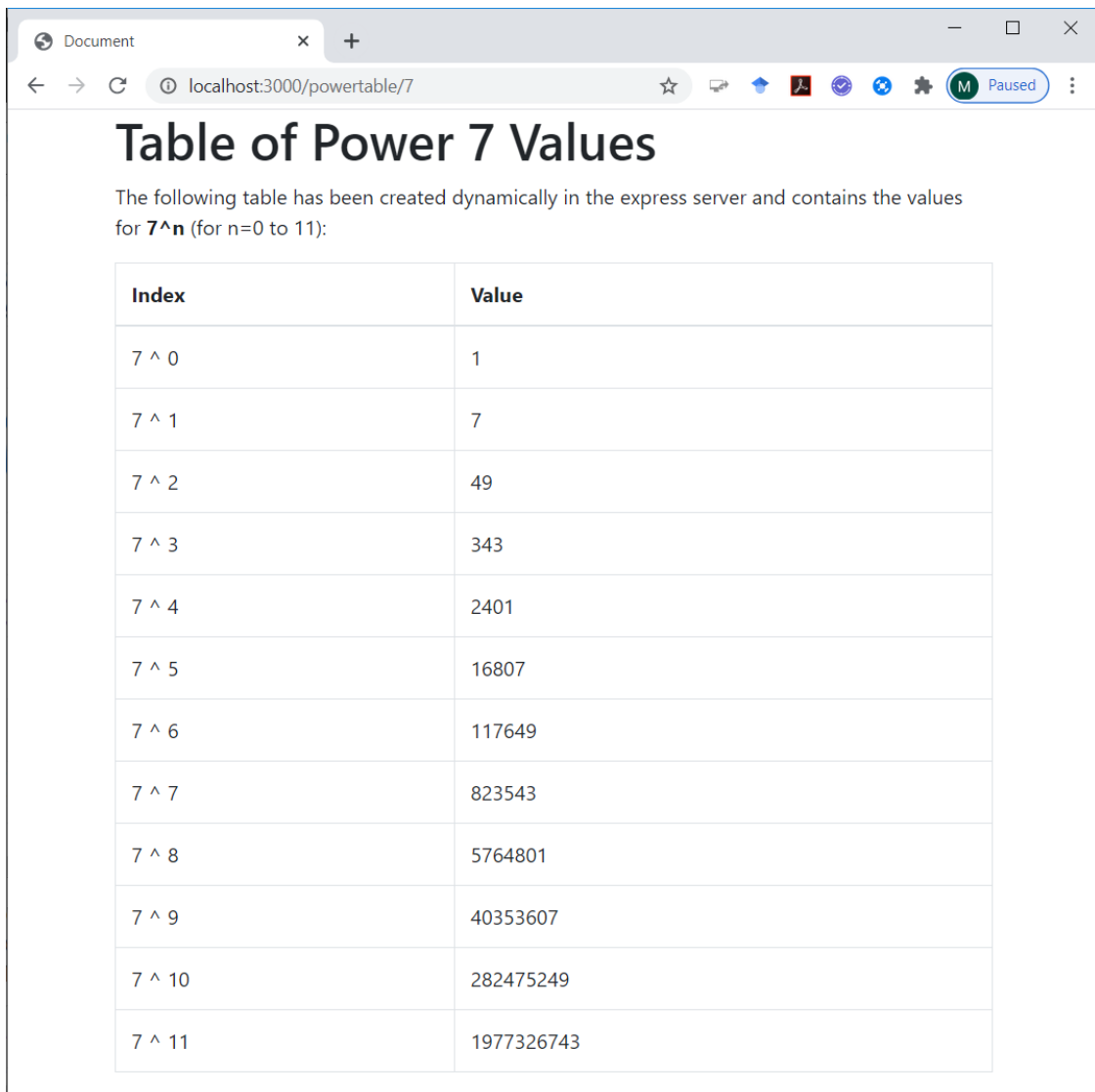
4. Open a web browser and visit `http://localhost:8080/powertable`, the power table of base 2 should be displayed (as in *Task 8.2C*) in the window like:

A screenshot of a web browser window. The address bar shows 'localhost:3000/powertable'. The page title is 'Table of Power 2 Values'. Below the title, a paragraph states: 'The following table has been created dynamically in the express server and contains the values for 2^n (for n=0 to 11):'. Below this is a table with two columns: 'Index' and 'Value'. The table contains 12 rows of data for n from 0 to 11.

Index	Value
2 ^ 0	1
2 ^ 1	2
2 ^ 2	4
2 ^ 3	8
2 ^ 4	16
2 ^ 5	32
2 ^ 6	64
2 ^ 7	128
2 ^ 8	256
2 ^ 9	512
2 ^ 10	1024
2 ^ 11	2048

Task8.3.1 Node.js application serving generated *Power 2* page

5. Visit `http://localhost:8080/powertable/7`, the table listing the *Power 7* should be displayed in the window like:



The screenshot shows a web browser window with the address bar displaying `localhost:3000/powertable/7`. The page title is "Table of Power 7 Values". Below the title, a paragraph states: "The following table has been created dynamically in the express server and contains the values for  $7^n$  (for  $n=0$  to 11):". A table is displayed with two columns: "Index" and "Value". The table contains 12 rows of data, showing the powers of 7 from  $7^0$  to  $7^{11}$ .

Index	Value
$7^0$	1
$7^1$	7
$7^2$	49
$7^3$	343
$7^4$	2401
$7^5$	16807
$7^6$	117649
$7^7$	823543
$7^8$	5764801
$7^9$	40353607
$7^{10}$	282475249
$7^{11}$	1977326743

Task8.3.2 Node.js application serving generated *Power 7* page

6. Visit `http://localhost:8080/powertable/7/20`, the table listing the *Power 7* should be displayed with a total of 20 values in the table, like:

Document

localhost:3000/powertable/7/20

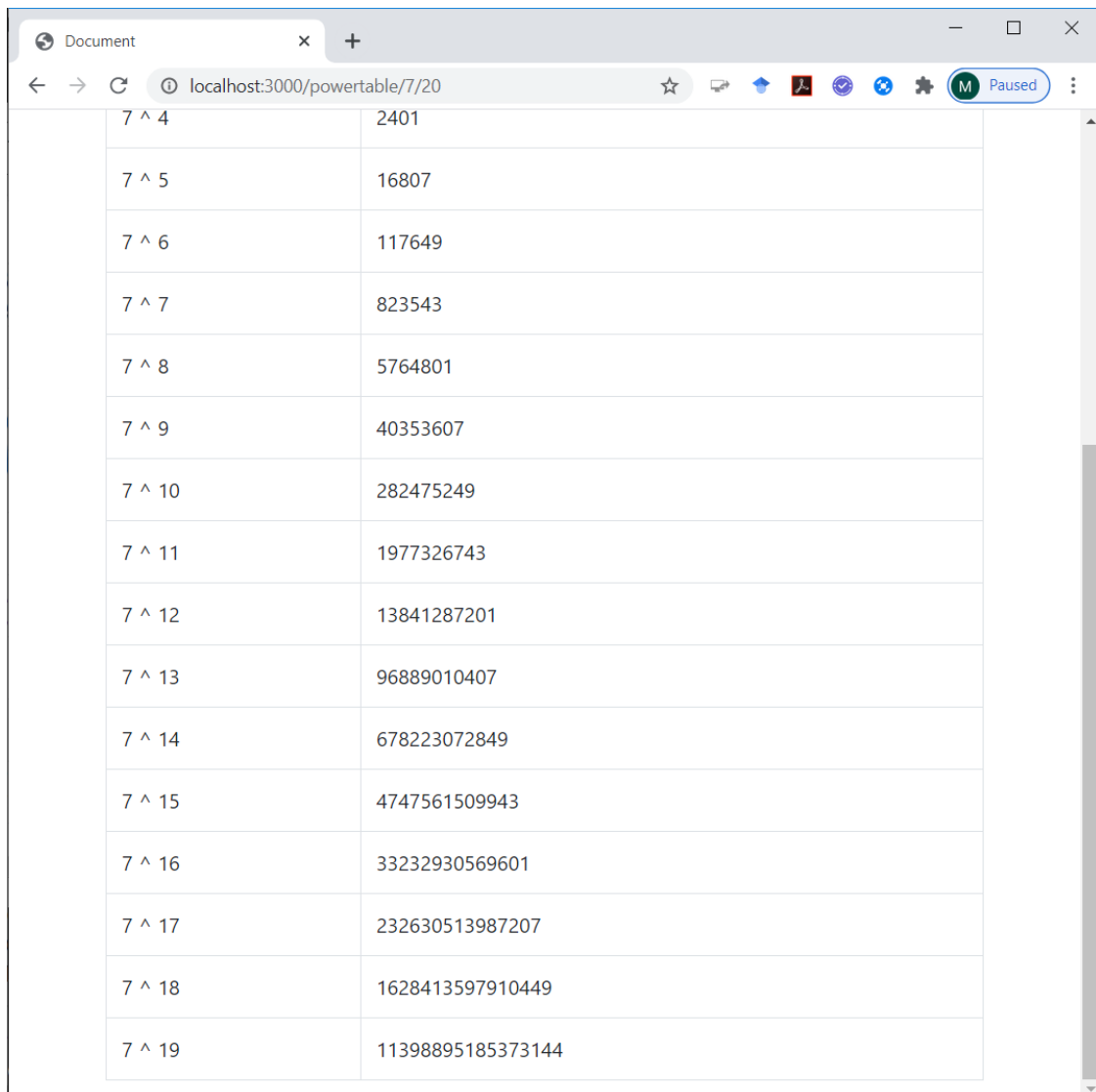
Paused

# Table of Power 7 Values

The following table has been created dynamically in the express server and contains the values for  $7^n$  (for  $n=0$  to  $20$ ):

Index	Value
$7^0$	1
$7^1$	7
$7^2$	49
$7^3$	343
$7^4$	2401
$7^5$	16807
$7^6$	117649
$7^7$	823543
$7^8$	5764801
$7^9$	40353607
$7^{10}$	282475249
$7^{11}$	1977326743
$7^{12}$	13841287201
$7^{13}$	96889010407
$7^{14}$	678223072849
$7^{15}$	4749561509943
$7^{16}$	33246930569601
$7^{17}$	232728513987207
$7^{18}$	1629099597910449
$7^{19}$	11403697185373143
$7^{20}$	80065880297612001

Task8.4.1 Node.js application serving generated *Power 7 with 20 iterations* page (*Showing 0-11*)



$7^4$	2401
$7^5$	16807
$7^6$	117649
$7^7$	823543
$7^8$	5764801
$7^9$	40353607
$7^{10}$	282475249
$7^{11}$	1977326743
$7^{12}$	13841287201
$7^{13}$	96889010407
$7^{14}$	678223072849
$7^{15}$	4747561509943
$7^{16}$	33232930569601
$7^{17}$	232630513987207
$7^{18}$	1628413597910449
$7^{19}$	11398895185373144

Task8.4.2 Node.js application serving generated *Power 7 with 20 iterations* page (*Showing 5-19*)

7. Go back to the Command Prompt or Terminal, and shutdown the server.

## Hints

To complete this task, review the **Route parameters** section of the *Express* guide on *Routing* and identify how the URL parameters can be passed/processed by respective Express routing functions.

The following webpage is a link to this guide:

- <https://expressjs.com/en/guide/routing.html>

## What will you submit?

You should submit:

- Source code of the file `multitaskServer.js`.
- Screenshot of the browser window showing the *Power 2* table when visiting `http://localhost:8080/powertable`.
- Screenshot of the browser window showing the *Power 7* table when visiting `http://localhost:8080/powertable/7`.
- Screenshot of the **bottom** of the browser window showing the *Power 7 with 30 iterations* table when visiting `http://localhost:8080/powertable/7/30`.