Prime Number Design

***Pseudocode:***

get\_desired\_number()

GET number #1

RETURN number

do\_calculation( number )

FOR num 🡨 0 … number + 1 #2

IF num > 1

FOR j 🡨 2 … num #3

IF num % j = 0 #4

BREAK

ELSE:

PUT num #5

main()

number 🡨 get\_desired\_number()

do\_calculation( number )

***Calculated Efficiency:*** O(n^2), due to the two FOR loops that are iterating 1 by 1 it’s measures out to be an O(n^2) algorithm.

***Trace:***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | number | num | j | Output |
| 1 | 20 | Null | Null |  |
| 2 | 20 | 0 | Null |  |
| 3 | 20 | 0 | Null |  |
| 2 | 20 | 1 | null |  |
| 3 | 20 | 1 | Null |  |
| 2 | 20 | 2 | Null |  |
| 3 | 20 | 2 | 2 |  |
| 4 | 20 | 2 | 2 |  |
| 5 | 20 | 2 | 2 | 2 |
| 2 | 20 | 3 | 0 |  |
| 3 | 20 | 3 | 2 |  |
| 5 | 20 | 3 | 2 | 3 |
| 2 | 20 | 4 | 2 |  |
| 3 | 20 | 4 | 2 |  |
| 4 | 20 | 4 | 2 |  |
| 2 | 20 | 5 | 2 |  |
| 3 | 20 | 5 | 2 |  |
| 3 | 20 | 5 | 3 |  |
| 3 | 20 | 5 | 4 |  |
| 5 | 20 | 5 | 4 | 5 |
| 2 | 20 | 6 | 4 |  |
| 4 | 20 | 6 | 2 |  |
| 2 | 20 | 7 | 2 |  |
| 3 | 20 | 7 | 2 |  |
| 3 | 20 | 7 | 3 |  |
| 3 | 20 | 7 | 4 |  |
| 3 | 20 | 7 | 5 |  |
| 3 | 20 | 7 | 6 |  |
| 5 | 20 | 7 | 6 | 7 |
| 2 | 20 | 8 | 6 |  |
| 3 | 20 | 8 | 2 |  |
| 4 | 20 | 8 | 2 |  |
| 2 | 20 | 9 | 2 |  |
| 3 | 20 | 9 | 2 |  |
| 3 | 20 | 9 | 3 |  |
| 4 | 20 | 9 | 3 |  |
| 2 | 20 | 10 | 3 |  |
| 3 | 20 | 10 | 2 |  |
| 4 | 20 | 10 | 2 |  |
| 2 | 20 | 11 | 2 |  |
| 3 | 20 | 11 | 2 |  |
| 3 | 20 | 11 | 3 |  |
| 3 | 20 | 11 | 4 |  |
| 3 | 20 | 11 | 5 |  |
| 3 | 20 | 11 | 6 |  |
| 3 | 20 | 11 | 7 |  |
| 3 | 20 | 11 | 8 |  |
| 3 | 20 | 11 | 9 |  |
| 3 | 20 | 11 | 10 |  |
| 5 | 20 | 11 | 10 |  |
| 2 | 20 | 12 | 10 |  |
| 3 | 20 | 12 | 2 |  |
| 4 | 20 | 12 | 2 |  |
| 2 | 20 | 13 | 2 |  |
| 3 | 20 | 13 | 2 |  |
| 3 | 20 | 13 | 3 |  |
| 3 | 20 | 13 | 4 |  |
| 3 | 20 | 13 | 5 |  |
| 3 | 20 | 13 | 6 |  |
| 3 | 20 | 13 | 7 |  |
| 3 | 20 | 13 | 8 |  |
| 3 | 20 | 13 | 9 |  |
| 3 | 20 | 13 | 10 |  |
| 3 | 20 | 13 | 11 |  |
| 3 | 20 | 13 | 12 |  |
| 5 | 20 | 13 | 12 |  |
| 2 | 20 | 14 | 12 |  |
| 3 | 20 | 14 | 2 |  |
| 4 | 20 | 14 | 2 |  |
| 2 | 20 | 15 | 2 |  |
| 3 | 20 | 15 | 2 |  |
| 3 | 20 | 15 | 3 |  |
| 4 | 20 | 15 | 3 |  |
| 3 | 20 | 16 | 3 |  |
| 2 | 20 | 16 | 2 |  |
| 3 | 20 | 16 | 2 |  |
| 4 | 20 | 16 | 2 |  |
| 2 | 20 | 17 | 2 |  |
| 3 | 20 | 17 | 2 |  |
| 3 | 20 | 17 | 3 |  |
| 3 | 20 | 17 | 4 |  |
| 3 | 20 | 17 | 5 |  |
| 3 | 20 | 17 | 6 |  |
| 3 | 20 | 17 | 7 |  |
| 3 | 20 | 17 | 8 |  |
| 3 | 20 | 17 | 9 |  |
| 3 | 20 | 17 | 10 |  |
| 3 | 20 | 17 | 11 |  |
| 3 | 20 | 17 | 12 |  |
| 3 | 20 | 17 | 13 |  |
| 3 | 20 | 17 | 14 |  |
| 3 | 20 | 17 | 15 |  |
| 3 | 20 | 17 | 16 |  |
| 5 | 20 | 17 | 16 |  |
| 2 | 20 | 18 | 16 |  |
| 3 | 20 | 18 | 2 |  |
| 4 | 20 | 18 | 2 |  |
| 2 | 20 | 19 | 2 |  |
| 3 | 20 | 19 | 2 |  |
| 3 | 20 | 19 | 3 |  |
| 3 | 20 | 19 | 4 |  |
| 3 | 20 | 19 | 5 |  |
| 3 | 20 | 19 | 6 |  |
| 3 | 20 | 19 | 7 |  |
| 3 | 20 | 19 | 8 |  |
| 3 | 20 | 19 | 9 |  |
| 3 | 20 | 19 | 10 |  |
| 3 | 20 | 19 | 11 |  |
| 3 | 20 | 19 | 12 |  |
| 3 | 20 | 19 | 13 |  |
| 3 | 20 | 19 | 14 |  |
| 3 | 20 | 19 | 15 |  |
| 3 | 20 | 19 | 16 |  |
| 3 | 20 | 19 | 17 |  |
| 3 | 20 | 19 | 18 |  |
| 3 | 20 | 19 | 18 | 19 |
| 3 | 20 | 20 | 18 |  |
| 3 | 20 | 20 | 2 |  |
| 5 | 20 | 20 | 2 |  |