PROGRAM 1

QUESTION:

Create a class Perfect having the following specifications:

Class Name: Perfect

Data Methods:

* int n – To store the number.

Member Methods:

* Perfect(int nn) – to initialize n with nn.
* int perfect() – to check whether the given number is perfect or not.
* void display() - to display the print statement.

Implement the main method to create object of the class and call the above methods properly.

ALGORITHM:

Step 1. Start.

Step 2. Create a class named `Perfect`.

Step 3. Declare an instance variable `n` to store the input number.

Step 4. Create a parameterized constructor `Perfect(int nn)` to initialize the instance variable `n` with the input value `nn`.

Algorithm for the `perfect(int n)` Method:

Step 1. Begin.

Step 2. If `n` is less than or equal to 1, return 0.

Step 3. Initialize a variable `sum` to 0.

Step 4. Iterate from `i` = 1 to `n – 1`.

* Check if `n` is divisible by `i` (i.e., `n % i == 0`).
* If divisible, add the value of `i` to `sum`.

Step 5. If `sum` is equal to `n`, return 1. Otherwise, return 0.

Step 6. End.

Algorithm for the `display()` Method:

Step 1. Begin.

Step 2. Call the `perfect(n)` method to determine if the provided number `n` is a perfect number.

Step 3. If the result is 1, print "The provided number is a perfect number." Step 4. Otherwise, print "The provided number is not a perfect number." Step 5. End.

Algorithm for the `main` Method:

Step 1. Begin.

Step 2. Create a `Scanner` object `sc` to read input from the user.

Step 3. Display a prompt asking the user to enter a number.

Step 4. Read the entered number using the `nextInt()` method of the `Scanner` object and store it in the variable `n`.

Step 5. Create an instance of the `Perfect` class using the input number `n`.

Step 6. Call the `display()` method on the created instance to determine and display if

the number is perfect or not.

Step 7. End.

**VARIABLE DESCRIPTION TABLE**

|  |  |  |
| --- | --- | --- |
| Variable Name | Variable Type | Description |
|  |  |  |
| n | int (instance) | An instance variable of |
|  |  | the class `Perfect` to |
|  |  | store the input number. |
|  |  |  |
| nn | int (parameter) | Parameter for the |
|  |  | constructor, |
|  |  | representing the input |
|  |  | number. |
|  |  |  |
| i | int (parameter) | Loop variable used for |
|  |  | iteration in the |
|  |  | `perfect(int n)` method. |
|  |  |  |
| sum | int | Variable to calculate the |
|  |  | sum of proper divisors |
|  |  | of `n` in the `perfect(int |
|  |  | n)` method. |
|  |  |  |
| sc | Scanner | A `Scanner` object used |
|  |  | to read input from the |
|  |  | user in the `main` |
|  |  | method. |
|  |  |  |
| number | Perfect (class) | An instance of the |
|  |  | `Perfect` class used to |
|  |  | perform operations |
|  |  |  |