Algorithmic Problem Solving

17ECSE309

Carol Number

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Carol Number

- A Carol number is an integer of the form $4^n - 2^{(n+1)} - 1$. An equivalent formula is $(2^n\text{-}1)^2 - 2$.

Binary Representation

- For $n > 2$, the binary representation of the n-th Carol number is $n - 2$ consecutive ones, a single zero in the middle, and $n + 1$ more consecutive ones.

  Eg: 47 is a Carol number and is represented as 101111

Given a number n, the task is to find the n’th Carol Number.

```
using namespace std;

int carol(int n)
{
    int result = pow(2, n) - 1;
    return result*result - 2;
}

int main()
{
  int n = 4;
  cout << carol(n);
  return 0;
}
```

First few carol numbers are 1, 7, 47, 223, 959…

Refrences:

- https://en.wikipedia.org/wiki/Carol_number

- https://www.geeksforgeeks.org/carol-number/