

Problem Set 2 Exercise #20: Goldbach's Conjecture

Reference: Lecture 5 notes

Learning objective: Repetition statements; Modular design

Estimated completion time: 50 minutes

Problem statement:

[Past year CS1101C Sit-in Lab Question]

Goldbach's conjecture (proposed by Christian Goldbach in 1742) is one of the oldest unsolved problems in number theory. It states: every even integer greater than 2 can be written as the sum of two primes.

Write a program **goldbach.c** to test Goldbach's Conjecture over a range of even numbers from 4 up to the input number n . This means that if the input is 8, you should check that 4 can be written as a sum of two primes ($2 + 2$), 6 can be written as a sum of two primes ($3 + 3$) and 8 can be written as a sum of two primes ($3 + 5$).

You need to write a modular program. Besides the **main()** function, there should be at least another function that computes some result.

You may assume that input number n is always an even number greater than 2.

Useful tips:

Similar to the previous exercise, you need to sort out your logic clearly before coding.

Sample run #1:

```
Enter n: 4
True
```

Sample run #2:

```
Enter n: 14
True
```