Exercise 4

Static Arrays I: Goldbach's Conjecture in Array

Introduction:

Goldbach's conjecture (named after German mathematician Christian Goldbach on June 7, 1742) is a problem which states that any even positive integer greater than four (4) can be expressed as the sum of two odd prime integers. Take for example

10 = 5 + 5, 3 + 7

Although this conjecture is able to hold up to 4×10^{18}, it is still unproven that all even positive integers above 4 has a Goldbach partition. So, this is one of the best-known unsolved problem in number theory and in mathematics (i.e. it remains open for proof for more than 200 years)

Learning Outcomes:

- Implement an initialization of the array with random natural numbers
- Implement a function to print the Goldbach's pair of an even natural number greater than 4 in array.

Problem Description:

```
/* Initializes array x of size s with random positive integers*/
void initArrayRandInt (int x[], int s);

/* Determines if integer x is an prime number, return 1 if prime 0 if
otherwise*/
bool isPrime(int x);

/* Determines if integer x is an even greater than 4, return 1 if even 0 if
otherwise.*/
bool isEven(int x);

/* Prints the Goldbach's pair (1 pair only) of element(s) in array (if there
are any). Using the functions isPrime and isEven*/
void printGoldbachsPairInArray (int x[], int s);
```