1. (30 pts) Define a recursive function that finds the number of subsets of an n-element set.

   ```c
   int subsetNumber(int n); // returns 2^n in a recursive way.
   ```

2. (20 pts) Implement the below “myCos” function, which computes the exponential function \( \cos(x) \) using Taylor series expansion.

   \[
   \cos x = 1 - \frac{x^2}{2!} + \frac{x^4}{4!} - \cdots \text{ for all } x
   \]

   ```c
   double myCos(double degree);
   ```

   “myCos” takes a value in degree (i.e., 45°, 60°), converts the degree value to the corresponding radian equivalent, and returns the cosine result computed through the first 5 terms of the Taylor series according to that radian value.
3. (30 pts) Some four digit numbers have the following property: The square of the sum of the first two digits and the last two digits of the given number is equal to the given number (i.e., given number= 3025 ---\( (30 + 25)^2 = 3025 \)).

Define a function that accepts a four digit positive integer and returns 1 if it has the above property, 0 otherwise.

\[
\text{int hasProperty(int n); // returns 1 if n has the property, 0 otherwise.}
\]

4. (30 pts) Write a program that reads the midterm grades of CS115 students from the keyboard, and finds the arithmetic average value of the grades. You should also define the related functions given below in order to call them in your main program:

\[
\text{void fillArray(int* array, int size); /*reads the grades into the array*/}
\]
\[
\text{float findAverage(int* array, int size); /*returns the average of the grades*/}
\]