

Using Jacobi's Method to solve $Ax = b$.

1. First google Jacobi's method for solving $Ax = b$. Read and understand this iterative method.
2. Write a function like following:

```
void Jacobi(int n, double * A, double * b, double * x) {  
    .....  
}
```

Arguments in this function: n is the array size, A is the $n \times n$ matrix, b is the vector with n elements, x is the solution vector with n elements.

Please use Jacobi's method to solve x , supposing A and b are given.

Hint: Set the maximum iteration number to be 20, no matter convergent or not.

Hint: To access $A_{i,j}$ element, you can use $A[i*n+j]$ or $*(A + i*n + j)$.

3. Write the main function to use Jacobi method.
 - a. Read n from the keyboard input. (Hint: You can google `scanf()` function.)
 - b. Dynamically allocate A as an $n \times n$ array of doubles; Initialize A as following:
Diagonal elements $A_{i,i} = 2.0$;
The off diagonal elements $A_{i,i+1} = -1.0$; $A_{i+1,i} = -1.0$;
All other elements are zero.

Hint: To access $A_{i,j}$ element, you can use $A[i*n+j]$ or $*(A + i*n + j)$.
 - c. Dynamically allocate b as an array of doubles with n elements. Initialize b to be zeros, except the first and last elements are 1.0;
 - d. Dynamically allocate x as an array of doubles with n elements. Initialize x to be zeros.
 - e. Use Jacobi method function solve $Ax = b$.
 - f. Print out the solution x for all the elements.
 - g. Release the memory block of A , x , and b .
4. Run your code and input n as 10. Copy your output solution of x into a report and submit together with you source code.

Hint: in the report you can also write all your experience got from doing this homework.