```
A = [7,-1,1,0;-2,8,-1,1;3,-1,9,2;0,1,-4,8];           %defining A
n = length(A);                                        %calculating n with the size of A to ma
ke the code more general
b = [-23;16;-17;13];                                  %defining b
xf = [-3;1;-1;1];                                     %defining the correct value of the x ve
ctor
x1 = [0;0;0;0];                                       %defining inital value of the x vector
for the itterative vector
test = true;                                          %initializing my test value for stoppin
g my while loop as true
m = 1;                                                %initializing m as 1 to count my ittera
tions from 1

while test == true                                    %using as there is multiple end conditi
ons and the numberr of itterations is not known till the itterative process is precice enough
    m = m+1;                                          %counting the number of loops so that t
he max nuber of loops conditions will be fufilled
    m2 = norm((x1 - xf),inf)/norm(xf,inf);            %calculatingg the precision of the itte
ration as is defined in the question
    if m > 999 || m2 < 10^-6                          %testing if either of my conditions are
 fuffilled. the value 999 is used for m so thaat the process will stop on itteration 1000
        test = false;                                 %setting test to false so that the whil
e loop will stop next itteration
    end
    x2 = x1;                                          %saving the value of the previous x^m f
or use during calculation
    for i = 1:n                                       %using a for loop to work through each
value of x vector up to x_n
        loopvar = 0;                                  %resetting loopvar to stop the value be
ing carried over from the previous itteration
        for j = 1:n                                   %itterating over j to do the sum within
 the jacobi method
            if i ~= j                                 %checking j =/= i as is required in the
 method
                loopvar = loopvar + A(i,j)*x2(j);     %doing the sum calculation as is specif
ied by the method
            end
        end
        x1(i) = (1/A(i,i))*(b(i)-loopvar);            %assigning the final value of this itte
rations calculation to x in the ith position
    end
end

fprintf("%i itterations were needed to get the aprroximation", m)
x1                                                %displaying the final value
```

```
14 itterations were needed to get the aprroximation
x1 =

   -3.0000
    1.0000
   -1.0000
    1.0000
```

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