

Quiz 10 was to work over and finish the script files we started (on the class website).

1. Script file 1: Exercise 24-26 on p. 409.

24. *SOLUTION:* Have Matlab continue the process you started, finishing the Gram-Schmidt process on the columns of A :

```
V(:,1)=A(:,1);
V(:,1)=V(:,1)/sqrt(V(:,1)'*V(:,1));
V(:,2)=A(:,2)-(A(:,2)'*V(:,1))*V(:,1);
V(:,2)=V(:,2)/sqrt(V(:,2)'*V(:,2));
V(:,3)=A(:,3)-(A(:,3)'*V(:,1))*V(:,1)-(A(:,3)'*V(:,2))*V(:,2);
V(:,3)=V(:,3)/sqrt(V(:,3)'*V(:,3));
V(:,4)=A(:,4)-(A(:,4)'*V(:,1))*V(:,1)-(A(:,4)'*V(:,2))*V(:,2)-
        (A(:,4)'*V(:,3))*V(:,3);
V(:,4)=V(:,4)/sqrt(V(:,4)'*V(:,4));
```

25. Using the previous code, we constructed the columns of Q (they are the columns of V). We can copy and paste that code into the next section, then add:

```
Q=V;
R=Q'*A;
```

26. This code performs the same computation, but is easier to implement because it uses a loop- Here is what each line of code does:

```
[nr,nc]=size(A);           %computes the number of rows, cols of A
q=A(:,1)/norm(A(:,1)); % initializes the first column of Q
Q=q;
for j=2:nc                  %Loop
    x=A(:,j);               % Take the jth column of A
    v=x-Q*Q'*x;             % Remove the components of x that are in Col(Q)
    v=v/norm(v);            % Normalize v - A good idea!
    Q=[Q v];                % Add that column to the rest.
end                          %End the loop
R=Q'*A;                     % Compute R
```

2. For the second script file, we just had a few lines to fill in:

- (a) For the Hanford data, we have: $m = 9.27$, $b = 114.68$
- (b) For the Knee Girth data, we have: $m = 1.889$ and $b = 102.75$

NOTE: One thing we have not discussed: How good is the line? Be sure and take Math 338!