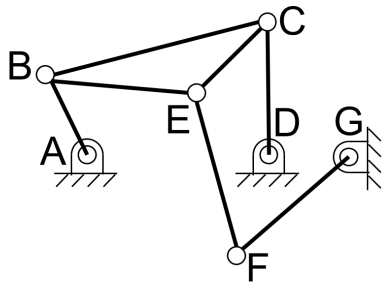
Write a code which will execute without error in the command prompt of: https://octave-online.net/

The code should do a forward kinematic analysis of the following mechanism:



The link lengths (in any unit of your choice) are given in: https://drive.google.com/file/d/1Aui1FhBxSPu33bRAOZuLHPxwp6A25JEc/view?usp=sharing
The last column gives the counterclockwise rotational speed of AB in radians per second.

If one or more of the link lengths are infeasible, then do the following:

1. Add comment lines in the first few lines of the code

2. Explain in the comment lines why the particular set of link lengths is infeasible

3. Mention a new value of the link length which will allow the set of link lengths to be feasible

4. Use this new value of link length

Start with any initial orientation of AB, choose a time step of your convenience and perform the forward kinematic analysis for three time steps. The time steps should ensure that the total rotation of AB over the three time steps is between 30 and 60 degrees. If the mechanism is non-Grashof and does not allow rotation of AB by 30 degrees, then reduce the length of AB. If you need to change the length of AB and any other link, then mention that as a comment line in the first few lines of the code. For the triangles BCE and ADG, if the sum of two sides is less than the third side, then state that (in the first line of the code as a comment line) and mention a new value of the smallest side which makes the lengths feasible.

After execution of the code, four images must be visible - either in the same page (viewing window) or as four separate images. The four images should correspond to the mechanism in initial position and after each of the three iterations. Compute the

velocity and acceleration (magnitude and direction) of the midpoint of link EF for these four positions and mention them after these images.

Annotation is not necessary. You do not have to write A, B, C … G in the images.

The four images can also be generated by solving the forward kinematics problem in the traditional manner (e.g. by solving loop closure equations). However, that will not earn any marks. The purpose of this exercise is to make you comfortable with the coding procedure discussed in the class. You are expected to follow that coding procedure.

The four positions of the mechanism can be arrived at through intelligent guesses for all the four positions and taking them as initial guesses for solving the displacement analysis problem four times. That is not the proper procedure. For a more complicated mechanism, you would be required to solve the displacement, velocity, and if required, the acceleration analysis equations, to arrive at the three positions after the three time steps. You are expected to follow this complete procedure.

You are welcome to use inbuilt equation solvers and inbuilt routines for numerical analysis e.g. Newton-Raphson method.

The code must be uploaded in Moodle as a single text file with your roll number as the filename. The code should execute without error when copy-pasted from this text file into the command prompt of:
https://octave-online.net/