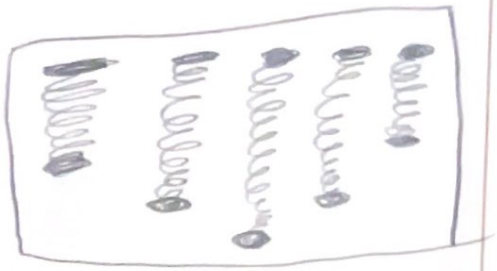
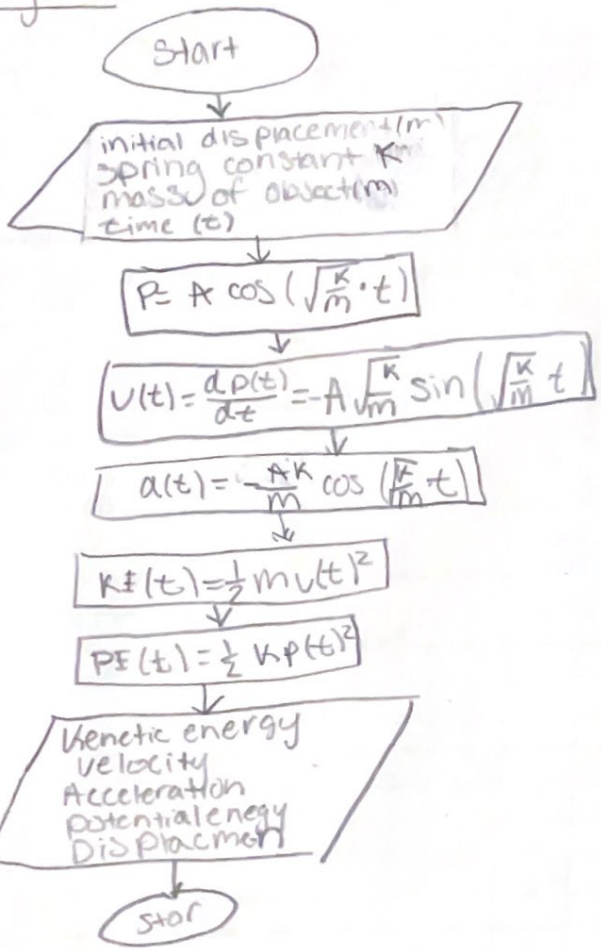
Problem Statment:

Use a program that outputs and returns the values for kenetic energy, potential energy, displacment, velocity and acceleration for an object that is simple harmonic motion while suspended with a spring. To do this we need to use the inputed values of the initial displacment of the string, the mass of the object, the spring and the times.

Diagrams:





Theory:

$P(t) = A\cos\sqrt{\frac{K}{m}} \cdot t$

$V(t) = \frac{dp(t)}{dt} = -A\frac{K}{m}\sin\left(\sqrt{\frac{K}{m}} \cdot t\right.$

$a(t) = \frac{dv(t)}{dt} = -\frac{AK}{m}\cos\left(\sqrt{\frac{K}{m}} \cdot t\right.$

$KE(t) = \frac{1}{2}mv(t)^2$

$PE(t) = \frac{1}{2}Kp(t)^2$

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Assumptions:

NO air resistanc
NO loss of energy
The users of the aplication will enter the right value

Solution:

Solutions are held in my submition of HW4p1_BartelM.vi

Verification:

$a(t) = \frac{-31-9}{8}\left(\sqrt{\frac{9}{8}} \cdot 20\right| = -106.06$ $KE(t) = \frac{11}{2}\ 20(-3.45)^2 = 119.025$

$v(t) = -4\sqrt{\frac{10}{8}} \sin\left(\sqrt{\frac{9}{20}} \cdot 6\right| = -3.45$ $PE(t) = \frac{1}{2}\ 10(-106.06)^2 = 56243$

$P = 31\cos\left(\sqrt{\frac{10}{12}} \cdot 4\right) = -27.05$

conclusion:

For the result of this task my lab veiw was able to put out the kenetic energy, displacement acceleration, velocity and potential energy. This was done by puting in the inputs of initial displacemen spring constants, mass of object and time