Assignment 1
Linear Systems and Approximations
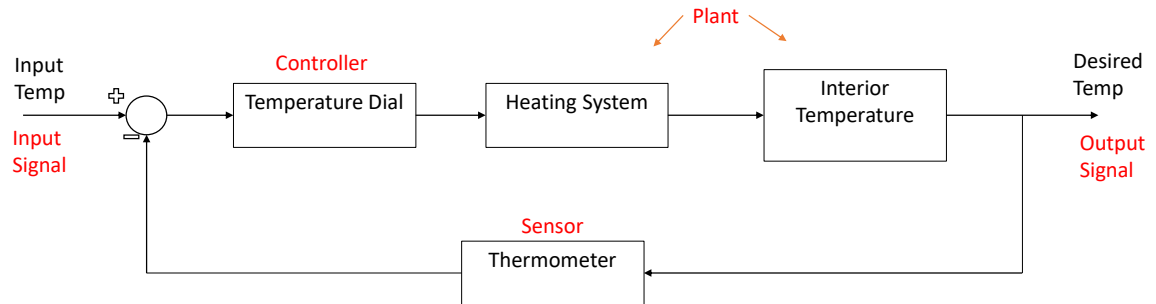
Nusair Islam

1. Control Systems – Oven

FIRST LOOK Oster XL French Door Convection Oven Pizza [Digital image]. (n.d.). Retrieved from
https://www.youtube.com/watch?v=Qv3kL6ePjNk

1. Control Systems – Oven

Plant

Input
Temp

Input
Signal

Controller

Temperature Dial → Heating System → Interior Temperature

Desired
Temp

Output
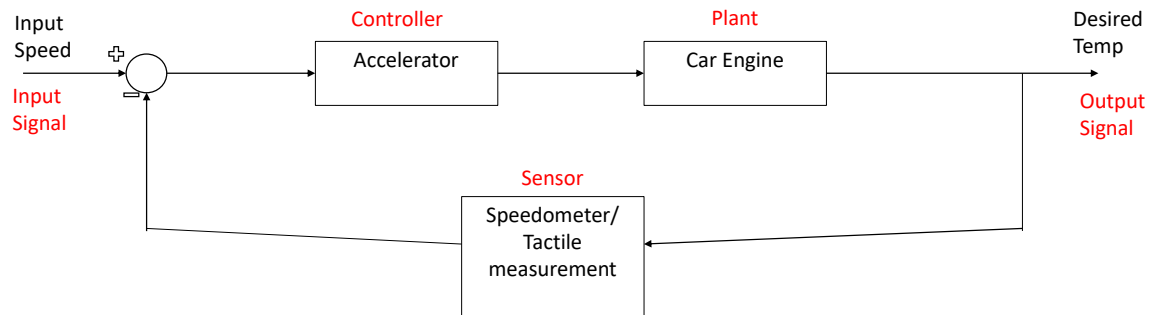Signal

Sensor

Thermometer

3
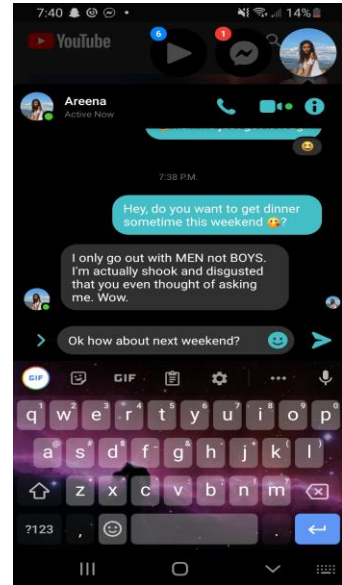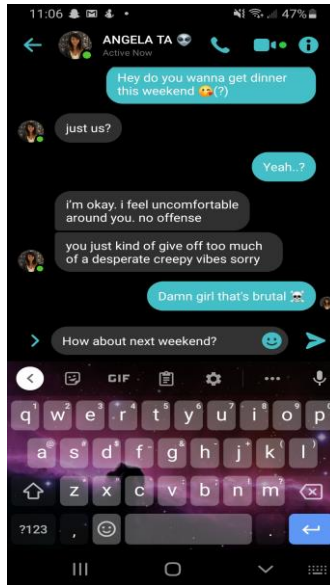
1. Control Systems – Car Speed

Mason, S. (n.d.). How accurate is your car speedometer? [Digital image]. Retrieved from
https://www.thecarexpert.co.uk/how-accurate-is-a-car-speedometer/

1. Control Systems – Car Speed

Input Speed

Input Signal

Controller

Accelerator

Plant

Car Engine

Desired Temp

Output Signal

Sensor

Speedometer/ Tactile measurement

1. Control Systems – Asking a Girl Out

1. Control Systems – Asking a Girl Out

Plant

Desire

Input
Signal

Controller

| Text Message | Girl's Feelings | Reply |

Desired
Outcome

Output
Signal

Sensor

| Re-Evaluation/
Desperation |
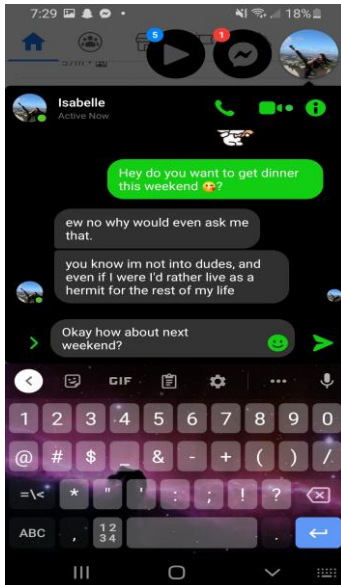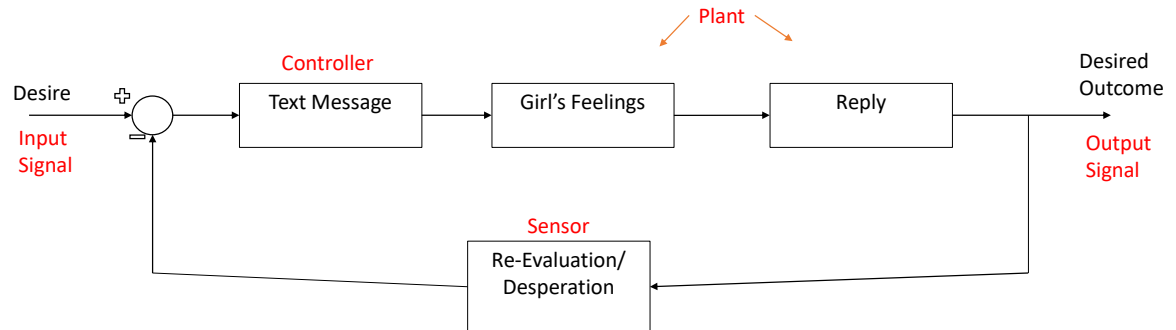
2. Plot sine wave

Figure 1. Sine Wave
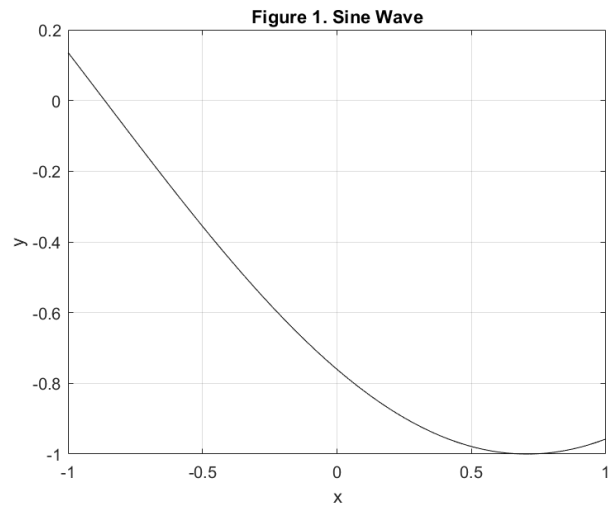
3. Plot linear approximation of sine wave segment

Figure 1. Sine Wave and Linear Approximation
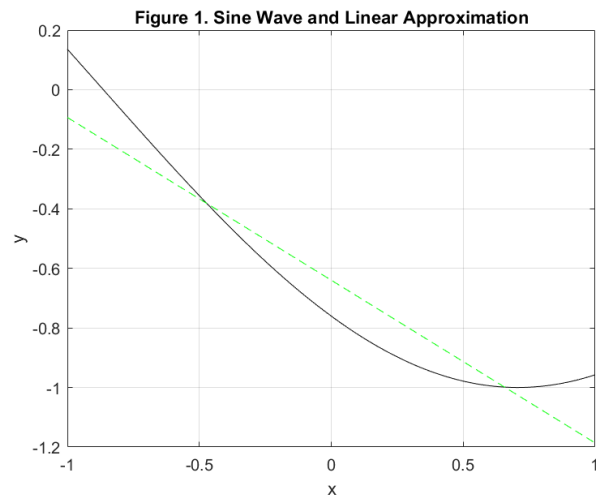
4. Plot the error between the sine wave and linear approximation, absolute value

Figure 2. Error between sine wave and linear approx