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Project 2 Analysis

This script is the main controller for the SR30 analysis in Project 2 of ME140. It should import data, and call the component functions for each of the individual parts of the project.

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```
clear all;
clc;
```

Usefull Constants

These are mostly conversion factors so that we can convert from imperial units collected into metric.

```
insqToMsq = 0.00064516; % [m^2/in^2]
lbfToN = 4.44822; % [N/lbf]
```

Given Data

The following values were supplied to us in the original project specifications and should not be changed.

```
pitotEffectiveArea = 6.4*insqToMsq; % [m^2]
jetAHeating = 42.8e6; % [J/kg/K]
A = [27.3, 6.4, 9.0, 7.2, 4.7, 3.87]'.*insqToMsq; % [m^2]
```

Import Collected Data

Our collected data is in an excel file named `Data_proj2`. Here we import that data into a vector for use in our MatLab script. The excel file should never be modified by our script.

```
fname = 'Data_proj2.xlsx';
sname = 'CollectedData';
range = 'A3:M11';
%[NUM, TXT, RAW] = xlsread(fname, sname, range); % basic reading
collectedData = readtable(fname, 'Sheet', sname, 'Range', range);
summary(collectedData);
```

Variables:

```
RPM: 8×1 double

    Values:

        Min            NaN
        Median         NaN
        Max            NaN
        NumMissing     8

T2: 8×1 double

    Values:

        Min            NaN
        Median         NaN
        Max            NaN
        NumMissing     8

T3: 8×1 double

    Values:

        Min            NaN
        Median         NaN
        Max            NaN
        NumMissing     8

T4: 8×1 double

    Values:

        Min            NaN
        Median         NaN
        Max            NaN
        NumMissing     8

T5: 8×1 double

    Values:

        Min            NaN
        Median         NaN
        Max            NaN
        NumMissing     8

T8: 8×1 double

    Values:

        Min            NaN
        Median         NaN
        Max            NaN
        NumMissing     8
```

```
P2: 8×1 double

    Values:

        Min            NaN
        Median         NaN
        Max            NaN
        NumMissing     8

P3: 8×1 double

    Values:

        Min            NaN
        Median         NaN
        Max            NaN
        NumMissing     8

P4: 8×1 double

    Values:

        Min            NaN
        Median         NaN
        Max            NaN
        NumMissing     8

P5: 8×1 double

    Values:

        Min            NaN
        Median         NaN
        Max            NaN
        NumMissing     8

P8: 8×1 double

    Values:

        Min            NaN
        Median         NaN
        Max            NaN
        NumMissing     8

Fuel: 8×1 double

    Values:

        Min            NaN
        Median         NaN
        Max            NaN
        NumMissing     8
```

```
Thrust: 8×1 double

    Values:

        Min            NaN
        Median         NaN
        Max            NaN
        NumMissing     8
```

Deliverable 2

Use your performance data and area measurements (listed in Appendix) to construct a series of plots showing how the following quantities vary with spool speed:

- station stagnation temperature (K),
- station stagnation pressure (kPa, absolute),
- station Mach number
- station velocity (m/s).

Make sure to include Station 1 in all of your plots.

Plot the mass flow rates of air and fuel (g/s) and the air-fuel ratio vs. spool speed.

Use your data to calculate the net thrust force and plot this along with the measured thrust (from the strain gage) vs. spool speed. Use air with variable specific heats as the working fluid. (Next week you will add products of combustion to your analysis and thereby be able to see the affect on your results.)

```
deliverable2();
```

```
Not enough input arguments.

Error in deliverable2 (line 4)
outputArg1 = inputArg1;

Error in proj2Analysis (line 64)
deliverable2();
```

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