How to parse your bag files in MATLAB

1. Ensure your bag file and your MATLAB script are in the same folder
2. Load your bag:

```
>> bag = rosbag("example.bag");
```

3. To see all the topics you recorded:

```
>> bag.AvailableTopics
```

4. We are interested in parsing the message data encapsulated by each topic. To see the message data:

```
>> bag.MessageList
```

5. I find it simplest to repackage each message as a struct- here is some example code:

```
>> bagfilename = ('example.bag');
>> bag = rosbag(bagfilename);

>> topic = select(bag, 'Topic', 'desired_topic');
>> struct = readMessages(topic, 'DataFormat', 'struct');
```

** **example**: I want to parse an IMU topic. The IMU topic is created by the

```
Ros message: /sensor_msgs/Imu
```

this message holds data from an IMU, the components of an IMU are: gyroscope and accelerometer (and sometimes magnetometer). Our bag file records data from these three components. This data is in the form of:

```
>> rosmsg info sensor_msgs/Imu

geometry_msgs/Quaternion Orientation
double[9] OrientationCovariance        % Row major about x, y, z axes

geometry_msgs/Vector3 AngularVelocity
double[9] AngularVelocityCovariance    % Row major about x, y, z axes

geometry_msgs/Vector3 LinearAcceleration
double[9] LinearAccelerationCovariance % Row major x, y z
```

To see the gyro data (angular velocity):

```
For i = length(struct)

        gyro_x(i) = struct{i}.AngularVelocity.X;
        gyro_y(i) = struct{i}.AngularVelocity.Y;
        gyro_z(i) = struct{i}.AngularVelocity.Z;

end
```

Now we have successfully parsed our gyro data.