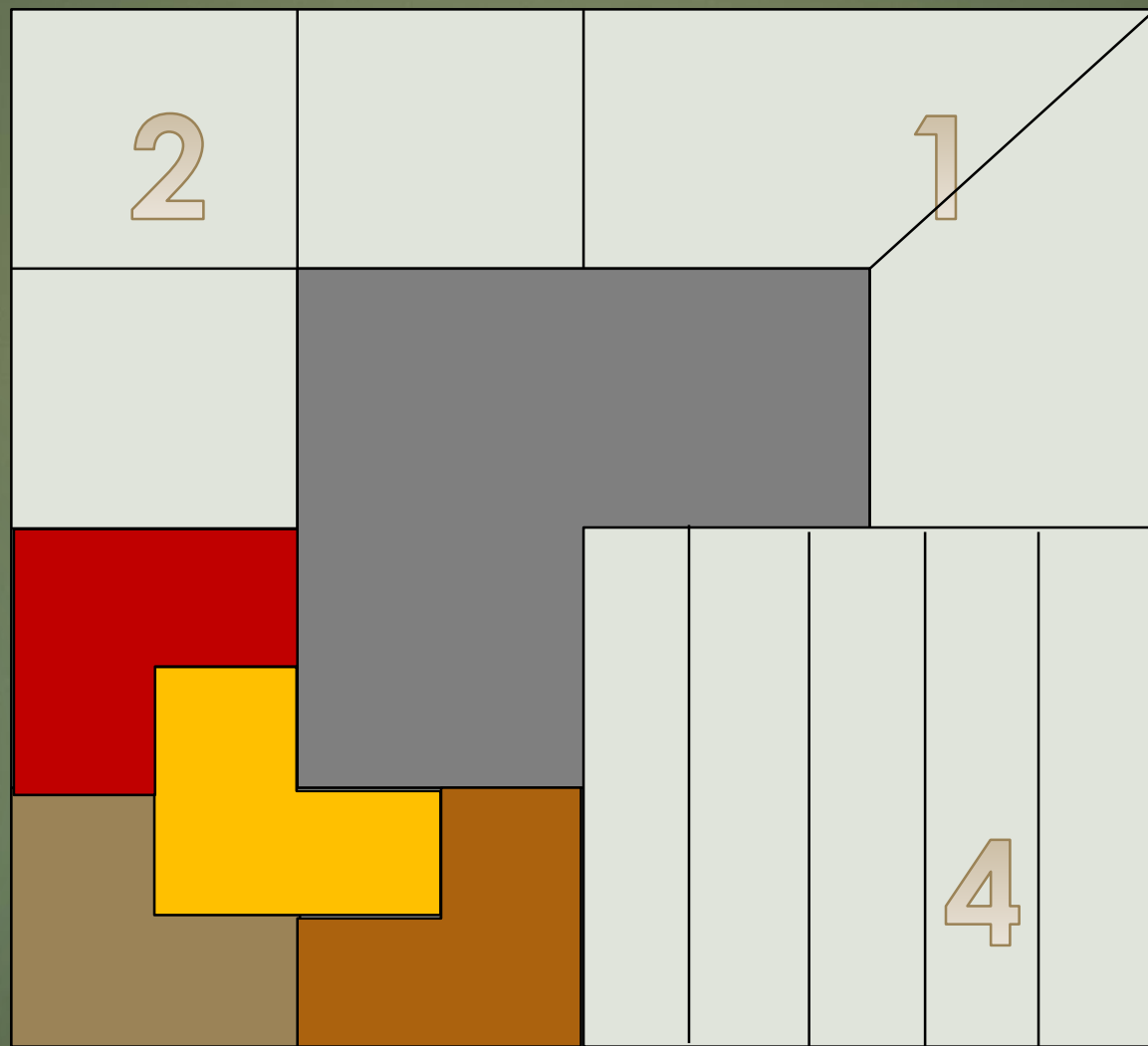


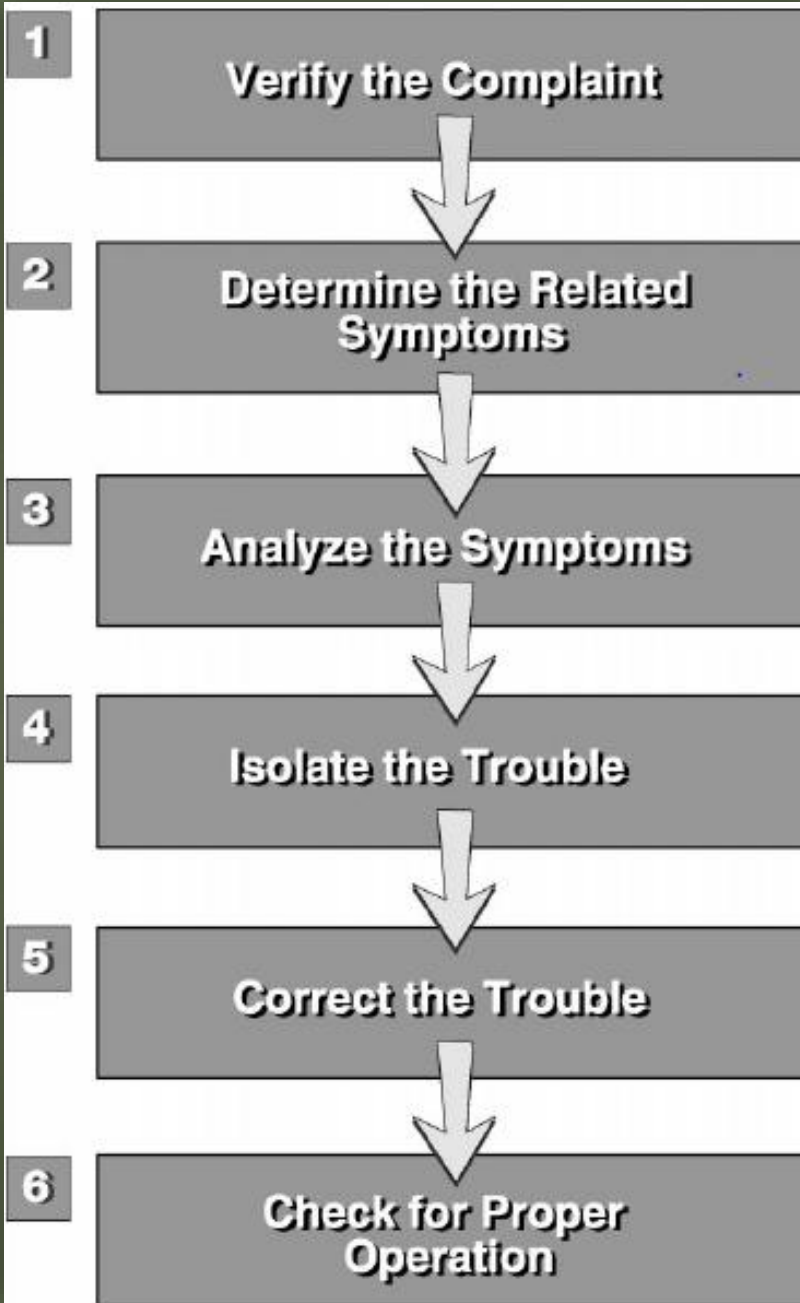


# MECHATRONICS ENGINEERS

AND WHERE  
TO FIND THEM

BY : MICHAEL SEDNY





# Session Outline :

- \* Knowledge check
- \* Mechatronics and control systems in automobiles ... Why ?!
- \* Example with & without Control
- \* 4 ways to get work experience in college
- \* What Egyptian automotive industry expect from Mechatronics Engineer

# Knowledge check



\*What do u know about Cars ?

\*What Systems u know in Cars ?

\*Which System is the most important ?



# Mechatronics and control systems in automobiles ... Why ?!

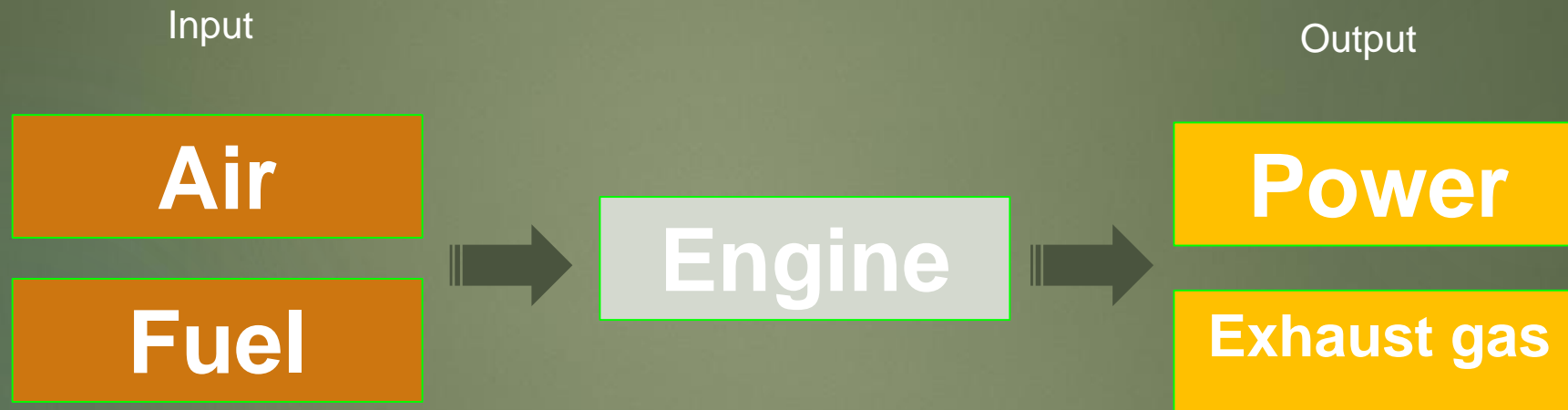




Example with & without Control:

“ Injection System “

# Injection System Outline:





# What is the air / fuel ratio ?

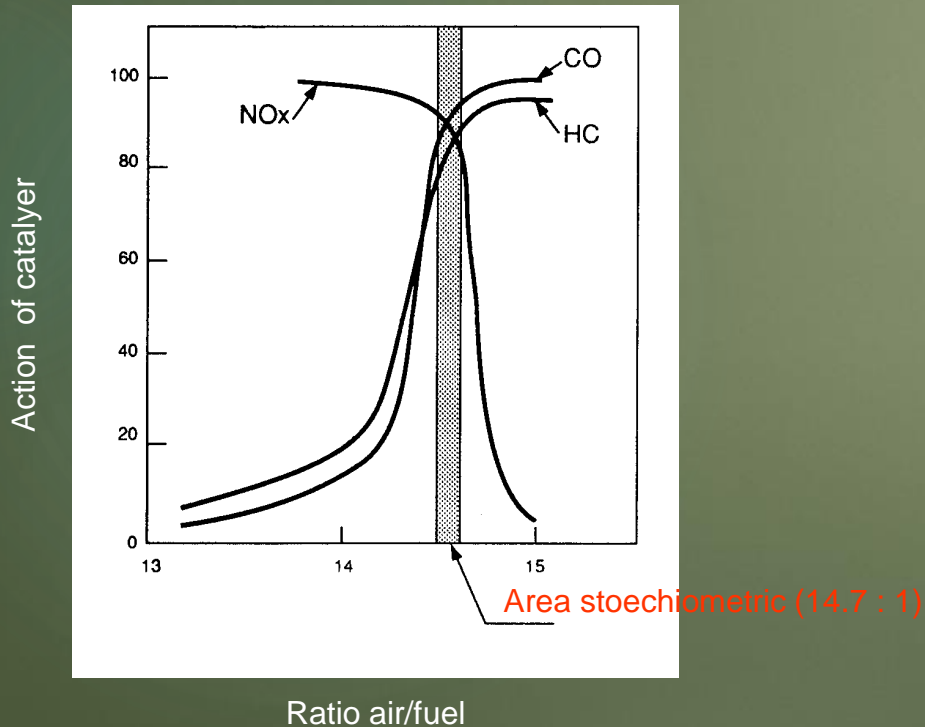
The ratio of quantity **of air**  
(for the necessary amount of oxygen)  
and the quantity **of fuel**  
(for the necessary amount of energy) .

For a gasoline engine we consider:

- Lean mixture at a ratio **>** than 14.7 : 1
- “Normal” Stiochemtric mixture at a ratio **=** 14.7 : 1
- Rich mixture at a ratio **<** than 14.7 : 1

# Why 14.7 ??

A ratio air/fuel of 14,7 : 1 is necessary to have the effect “.....**stoichiometric**.....” of the catalyser



The gases NOx ,HC et CO are catalised most efficient at the **area stoichiometric**.. ( $\pm 90\%$ ).

# Why an electronic control ?

✦ A better control of the mixture of **air/ fuel**..  
during:

- ◆ starting
- ◆ cold engine
- ◆ hot engine
- ◆ idling
- ◆ acceleration

✦ Less mechanical wear (more reliable)

✦ Quicker reaction time

✦ Better emission control (exhaust gas)

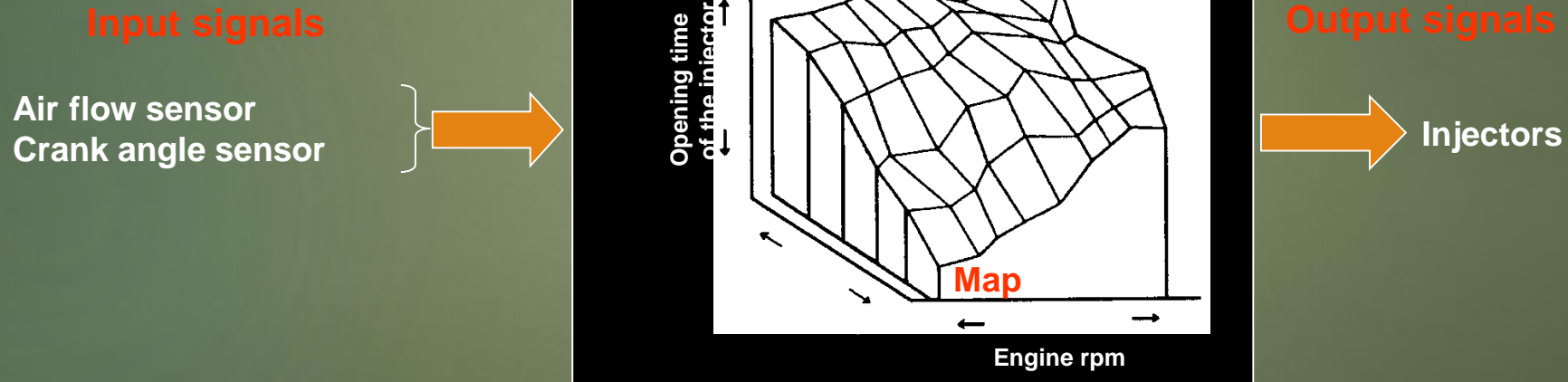
# Needs for an Electronic System :

1- Sensors

2- ECU

3- Actuators

An ECU is an electronic calculator (processor) with memory for seeing with different **maps**.....which are used by the system to handle the **input signals**..... and sending the **output signals**..... to the actuators.



# Sensors and Actuators


**TIME** 😊  
FOR A  
**BREAK**



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# 4 ways to get work experience in college



1-On-campus student employment

2-Internships and Trainings

3-Volunteer opportunities or independent study

4-Undergraduate research



What Egyptian automotive industry  
expect from Mechatronics Engineer



What an Employer Needs from You ?

Your Attitude  
knowledge

Your Attitude

Your Attitude

Your Attitude

Your Attitude

Your Attitude



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Cheer up .. we are Engineers  
Everything is Possible ..



It always seems impossible  
until it's Done !

Try to pass through your paper





# Thank You

Do not hesitate to take a business card