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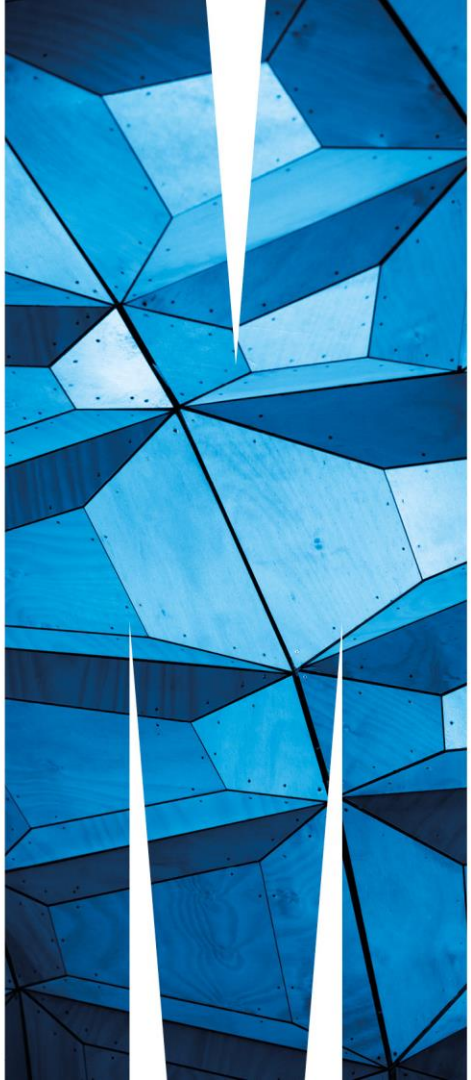
ENGINEERING
ENG1060



VARIABLES

Presented by Tony Vo

Slides by Tony Vo

GROUP OF EIGHT AUSTRALIA

WHAT IS A VARIABLE?

- A variable is a MATLAB "object" whose value can change
- You have used variables in algebra
  - E.g. The Lecturer's age is twice the age of the Student
    L = 2 × S
- Variables can be thought of as containers that hold data
- Variables are used all throughout your programming

DEFINING VARIABLES?

- Syntax: variable_name = value

- Simply have a variable name equal to a value
  - E.g. distance = 40
  - E.g. gravity = 9.81
  - E.g. altitude = 10000

VARIABLE NAMING RULES

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- MUST start with a letter (lower case or upper case)
  - Cannot start with a numerical character: 0 1 2 3 4 5 6 7 8 9
- No special characters are allowed as they are built in MATLAB functions

  , . / : ; ~ ^ ! ? % & * ( ) { } [ ]
- No foreign characters

  Γ Ψ Ω Π ώ 안 녕 하 세 요 Ë Ɲ ũ Ậ
- No blank spaces

  car acceleration

EXCEPTIONS

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- Underscores are allowed as long as it is not the first character

  this_is_okay

  ~~_this_is_not_okay~~

- Numerics can be used as long as it is not the first character

  y11 y22 y33 y44

  ~~1y1 2y2 3y3 4y4~~

EXAMPLES

- Identify which variable names are incorrectly defined
  1. A, y_2, D4, xyz, x&y, diff_m
  2. Time, t1me, time, tim3, 7ime
  3. Exam_results, exam+results, examresults, exam
  4. To_infinity, piano, correct variable, semi

HOW TO USE VARIABLES

- You can call the variable by typing the variable name
  - It will print the value to screen

- You can use variables in calculations

  E.g. vel = 40

  vel_squared = vel^2

- You can't use a variable until you define it. Order matters!

  E.g. distance = 40

  speed = distance / time (time variable not yet specified)

  time = 10

CASE SENSITIVITY

- Variables in MATLAB are cASe sEnSITiVE

  E.g. MONASH, Monash, monash, MonaSH, MONasH

  are all different

- Avoid using similar variable names that differ only in sensitivity!

- A common mistake…

```
Command Window
>> Time = 10

Time =

    10

>> Future_time = time + 10
Undefined function or variable 'time'.

Did you mean:
>> Future_time = Time + 10
```

BE DESCRIPTIVE

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- In industry, team members may use your code and *vice versa*
  - They need to be able to understand what you are doing

- Calculation involving Sydney's and Melbourne's temperature

  Which one is most descriptive?

  S = M + 15

  Sydney = Melbourne + 15

  Syd_temp = Melb_temp + 15

- Be descriptive but don't go too far!

  Sydney_temperature_in_degrees_Wednesday_19_August_2015_5pm

CHOOSING VARIABLE NAMES

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- Choose easy to understand variable names
  - Avoid using single letters for everything (e.g. a, b, c…)
  - These skills fall under good programming practices and will be graded

- Variable for the car's acceleration
  - car_acceleration
  - car_accel
  - car (mass, size, speed?)
  - ca (calcium? calories? California?)
  - c (can stand for anything without context)
  - banana

VIDEO SUMMARY

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- What is a variable?
- How to define variables and naming rules
- How to use variables
- Good programming practices relating to variable naming

- Can a variable have multiple values?