RUNNING HMM & DECISION TREE

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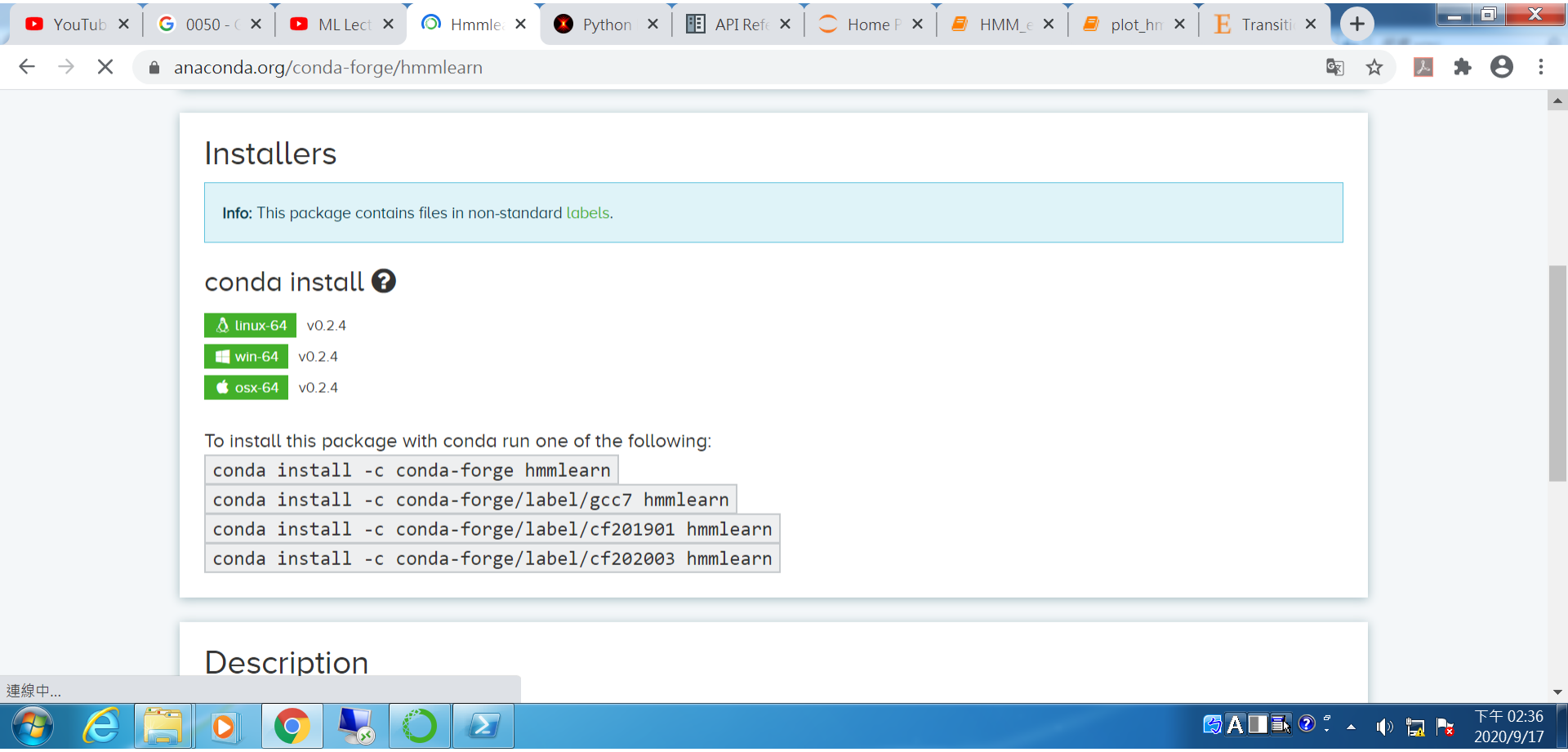
Install HMM package

- Try the following to see if it works



Install HMM package

- If it does not work, need alternatives
- Figure out your OS (win32 or win64)
  - From setting -> system -> about (win 10)
- Figure out your Python version
  - Jupyter Notebook -> about
- Goto https://www.lfd.uci.edu/~gohlke/pythonlibs/
  - Download hmmlearn-0.24-cpxx-cpxxm-(win32 or win64) to **Downloads folder**
  - CP xx means python version, such as 3.8 in my computer

Install HMM package

- Use powershell prompt
  - Change working directory to Downloads
  - Type in the following after the CMD prompt
    - pip install hmmlearn-0.2.4-**cp38-cp38-win32**.whl
    - Use your actual file name here
    - Don't forget file name extension (.whl)
- If everything goes OK, you will see
  - Installing collected packages: hmmlearn
  - Successfully installed hmmlearn-0.2.4

Use HMM

- Use this line
  - from hmmlearn import hmm
- Check the document for usage
  - https://hmmlearn.readthedocs.io/en/latest/

Decision tree

- Scikit_learn has a library for decision tree
- However, there is no option to choose between ID3, C4.5, or CART
  - Use criterion='entropy‘ for ID3 (maybe, not fully confirmed)
  - Default is to use gini criteria, which leads to CART
  - Don’t know how to invoke C4.5 (entropy ratio)

Decision tree

- Sklearn decision tree does NOT support **categorical** input data
  - Such as sunny, overcast, rainy
- One walk around is to use **one-hot encoding**
  - Sunny, overcast, rainy
  - 1,0,0 (for sunny)
  - 0,1,0 (for overcast)
  - 0,0,1(for rainy)

Decision tree

- Is one-hot a good encoding approach
  - Hard to say, not very good
  - Attributes are **sparse**
  - Generated tree may not match what we get with categorical data
- How about numerical encoding
  - Sunny = 2, overcast = 1, rainy = 0
  - It means **ordering** (sunny > overcast>rainy)
  - Not truly correct