ITEC 1150
Chapter 12
Lab Projects

WEB REQUESTS & SCRAPING

Program Development Plan (PDP)

This is a step-by-step process for successfully constructing an application. Follow these steps and repeat until you have successfully completed the program.

This is a reminder to use the PDP process.

You do not need to turn in your PDP document, but going through the process will help you design your programs.

PDP template -

1. Problem definition
2. Analysis of variables & functions
3. Steps in algorithm
4. Code (separate .py file with added comments)
5. Screen snips from testing
6. Keep track of any wanted or needed improvements for a future version

General Requirements

All assignments must meet the following requirements:

The program must start with header at top and include appropriate comments throughout. Header example:

```
"""
Author: Erik Granse
Date: 2024-09-02
Description: Calculate and display student's average grades
"""
```

- Ensure the output is *information*; it needs to be a statement which explains the value being displayed (for example, “The average grade is 12.34”). Simply outputting “12.34” is not sufficient.

General Requirements (cont.)

All assignments must meet the following requirements:

- The data in the program must be stored in variables.
- The output **must** come from variables in the program
  - Do not simply hard code the output value in the `print()` statement.
  - Some data will be given to you, and some will be user input—any calculations that need to happen must be in your program. Don't calculate somewhere else and enter the value into your program.

General Requirements (cont.)

All assignments must meet the following requirements:

- All input must be validated to ensure the string from `input()` can be turned into a number without crashing.
- All input must be validated to ensure it meets the requirements of the lab (for example, ensuring an age is >= 0 or a quiz score is between 0 and 10).
- If input is not valid, you must give a message to the user and allow them to try again until the input is valid.
- Exemptions to the above will be called out in the lab sections. **If not exempted, validation is required!**

General Requirements, continued

- MIPO:
  - Main
  - Inputs
  - Processing
  - Outputs
- This is the basic structure all our programs will now follow.
- Add additional functions as necessary, but the MIPO functions must exist and be used.
- Generic exception handling must be used to ensure input errors do not cause a crash.
- Programs must offer restart to the user when they are done.

Lab Section 1: Data Download

MIPO not required for this section

- Create a program named **data_download.py**. The program must:
  - Download a .txt file from the internet
  - Display the contents of the file
- You may use any text file you find on the internet, or use the one from the example on the right: https://www.unicode.org/Public/MAPPINGS/ISO8859/8859-1.TXT

```
# 8859-1.TXT
# Date: 2015-12-02 20:19:00 GMT [KW]
# © 2015 Unicode®, Inc.
# For terms of use, see http://www.unicode.org/terms_of_use.html
#
#   Name:             ISO/IEC 8859-1:1998 to Unicode
#   Unicode version:  3.0
#   Table version:    2.0
#   Table format:     Format A
#   Date:             1999 July 27 (header updated: 2015 December 02)
#   Authors:          Ken Whistler <ken@unicode.org>
#
#   General notes:
#
#   This table contains the data the Unicode Consortium has on how
#       ISO/IEC 8859-1:1998 characters map into Unicode.
```

Lab Section 2: Weather Forecast

MIPO not required for this section

- Create a program named **weather_data.py**. The program must:
  - Accept a URL from the user, which *should* be for a forecast from the National Weather Service.
  - Attempt to download the page.
    - If there is a problem downloading the page (status code other than 200, or any connection errors), display an error message to the user and have the user try again.
  - If a page is successfully downloaded, get the following elements from the page, in two lists:
    - Elements with the class '`.forecast-label`', which are time periods for the forecast
    - Elements with the class '`.forecast-text`', which are the predicted weather conditions for each time period.

Do not allow an exception to be printed out!
You may need to put most of your code inside a a try/except block to accomplish this.

Lab Section 2: Weather Forecast (cont.)

- If there is no data in your lists, print an error message and have the user try again.
- Loop through the two lists in parallel and print the content in two columns as shown in the example.
- See https://forecast.weather.gov/MapClick.php?lat=44.9774859&lon=-93.2643669 for an example of the page your program will be asked to get data from.

Lab Section 2: Weather Forecast Example

Bad URL message

No data message

```
Please enter the URL for your weather forecast: http://bad.domain
There was an error with URL provided. Please try again.
Please enter the URL for your weather forecast: https://forecast.weather.gov/
No data found at that url. Please try again.
Please enter the URL for your weather forecast: https://forecast.weather.gov/MapClick.php?lat=44.9774859&lon=-93.2643669
Overnight           Rain.  Low around 46. Breezy, with an east southeast wind 10 to 20 mph, with gusts as high as 30 mph.  Chance of precipitation is 100%. New precipitation amounts between a quarter and half of an inch possible.
Tuesday             Rain likely, mainly before 10am.  Cloudy, with a temperature falling to around 44 by 5pm. Breezy, with a south southeast wind 10 to 20 mph becoming west southwest in the morning. Winds could gust as high as 35 mph.  Chance of precipitation is 70%. New precipitation amounts of less than a tenth of an inch possible.
Tuesday Night       A 20 percent chance of snow after 5am.  Mostly cloudy, with a low around 33. West southwest wind 10 to 15 mph, with gusts as high as 25 mph.
Wednesday           Snow likely, mainly after noon.  Mostly cloudy, with a high near 36. West wind around 15 mph, with gusts as high as 30 mph.  Chance of precipitation is 60%. New snow accumulation of less than a half inch possible.
Wednesday Night     A 30 percent chance of snow, mainly before midnight.  Mostly cloudy, with a low around 28. Northwest wind around 15 mph, with gusts as high as 25 mph.
Thursday            Partly sunny, with a high near 38. Northwest wind around 15 mph, with gusts as high as 25 mph.
Thursday Night      Mostly cloudy, with a low around 28. Northwest wind 10 to 15 mph.
Friday              Partly sunny, with a high near 36. Northwest wind around 10 mph.
Friday Night        Mostly cloudy, with a low around 26. Northwest wind 5 to 10 mph.
Saturday            Partly sunny, with a high near 34. Northwest wind around 5 mph.
Saturday Night      Mostly cloudy, with a low around 28. North northeast wind around 5 mph becoming east southeast in the evening.
Sunday              Mostly cloudy, with a high near 39. South southeast wind 5 to 10 mph.
Sunday Night        A slight chance of rain and snow.  Mostly cloudy, with a low around 28. South southeast wind around 10 mph becoming west northwest after midnight.  Chance of precipitation is 20%.
Monday              Mostly cloudy, with a high near 34. West northwest wind around 10 mph.
```

Upload! Then…READ CH 16

Comment your code - for every program!

Save your programs, for future reference.

Submit 2 py files: data_download.py, and weather_data.py to D2L before the deadline.

Questions or need help? Ask before the deadline!