Tracing Ifs

Computer Science - Week 3  
Jul 29, 2022 - Version 1.0.4

Please make sure that all members of the group place their UD **email** AND **name** below.

Choose roles following the [instructions here](https://blockpy.cis.udel.edu/assignments/reading/bakery_appendix_pogil).

You should work in groups of 3. If you cannot find 3 group members, then work in groups of 2.

| **Role** | **Name** | **Email** |
| --- | --- | --- |
| **Manager** |  |  |
| **Speaker** |  |  |
| **Recorder** |  |  |

# 1) Code Reading

The Manager should download the following Python code and open it in Thonny: <https://gist.githubusercontent.com/acbart/7b8b1e0d2687defe428abb15cc4490f5/raw/567253df715d134d603767912b0d93f37f3f3a89/tracing_ifs.py>

Together, your group should read through the code.

1. What does this code do? Explain in plain english. Focus on explaining the entire code’s purpose, not the little details of what each line does. Aim to write at least 3 sentences.

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2. How many [**scopes**](https://python-sneks.github.io/pages/v3_0/22-scope/) are there in the program? Remember, IF statements do NOT have their own scope, but functions DO.

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3. How many **bodies** are there in the program? Remember, IF statements and Functions BOTH have their own bodies. Hint: You probably forgot one special body that every program has!

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4. Write out each scope’s name (using the name of the function for their scope), and list the variables defined inside of each scope:

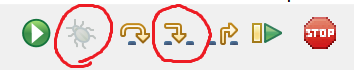
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# 2) Code Tracing

5. Assuming the user typed in the text Wednesday, write out the order that the lines are executed in the boxes below. Some boxes are already filled out for you.

Before you get started, here are some hints:

* You may not need all the boxes.
* Only write a line number when it is **started**, not when it is **returned** to.
* You can assume the function call jumps to the first line of the body, not the header.
* Use the Debugger in Thonny to complete this problem! That’s the “bug” button that lets you “Step Into” code. Alternatively, you can use the [Python Tutor website](http://www.pythontutor.com/visualize.html#code=today%20%3D%20%22Tuesday%22%0Adef%20is_early%28day_of_week%3A%20int%29%20-%3E%20bool%3A%20%0A%20%20%20%20return%20day_of_week%20%3C%202%20%0A%20%0Adef%20is_late%28day_of_week%3A%20int%29%20-%3E%20bool%3A%20%0A%20%20%20%20return%20day_of_week%20%3E%3D%204%20%0A%20%0Adef%20convert_date%28date%3A%20str%29%20-%3E%20int%3A%20%0A%20%20%20%20if%20date.lower%28%29%20%3D%3D%20'monday'%3A%20%0A%20%20%20%20%20%20%20%20return%200%20%0A%20%20%20%20elif%20date.lower%28%29%20%3D%3D%20'tuesday'%3A%20%0A%20%20%20%20%20%20%20%20return%201%20%0A%20%20%20%20elif%20date.lower%28%29%20%3D%3D%20'wednesday'%3A%20%0A%20%20%20%20%20%20%20%20return%202%20%0A%20%20%20%20elif%20date.lower%28%29%20%3D%3D%20'thursday'%3A%20%0A%20%20%20%20%20%20%20%20return%203%20%0A%20%20%20%20elif%20date.lower%28%29%20%3D%3D%20'friday'%3A%20%0A%20%20%20%20%20%20%20%20return%204%20%0A%20%20%20%20else%3A%20%0A%20%20%20%20%20%20%20%20return%205%20%0A%20%20%20%20%20%20%0Adef%20is_valid_day%28date%3A%20str%29%20-%3E%20bool%3A%20%0A%20%20%20%20return%20date.endswith%28'day'%29%20%0A%20%0Adef%20get_today%28%29%20-%3E%20str%3A%20%0A%20%20%20%20date%20%3D%20input%28%22What%20is%20the%20current%20day%20of%20the%20week%3F%22%29%20%0A%20%20%20%20if%20not%20is_valid_day%28date%29%3A%20%0A%20%20%20%20%20%20%20%20return%20%22Unknown%20day%22%20%0A%20%20%20%20return%20date.title%28%29%20%0A%20%0Adef%20main%28%29%3A%20%0A%20%20%20%20today%20%3D%20get_today%28%29%20%0A%20%20%20%20print%28%22Today%20is%22,%20today%29%20%0A%20%20%20%20day_of_week%20%3D%20convert_date%28today%29%20%0A%20%20%20%20if%20is_early%28day_of_week%29%3A%20%0A%20%20%20%20%20%20%20%20print%28%22You%20have%20plenty%20of%20time,%20relax!%22%29%20%0A%20%20%20%20elif%20is_late%28day_of_week%29%3A%20%0A%20%20%20%20%20%20%20%20print%28%22Well,%20it's%20too%20late%20now.%20Better%20give%20up!%22%29%20%0A%20%20%20%20else%3A%20%0A%20%20%20%20%20%20%20%20print%28%22It's%20not%20even%20due%20yet!%20It%20can%20wait.%22%29%20%0A%20%20%20%20%20%20%0Amain%28%29%0Astatus%20%3D%20is_early%28convert_date%28today%29%29%0Aprint%28status%29&cumulative=false&curInstr=0&heapPrimitives=false&mode=display&origin=opt-frontend.js&py=3&rawInputLstJSON=%5B%5D&textReferences=false) to run and step through the code.
* Seriously, use Thonny. If you guess on this one, you are almost guaranteed to get it wrong.



| **1** | **2** | **5** |  |  |  |  |  |  |  |
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# 3) Thinking Critically

6. For each function in the program, give two unit tests. Remember that a unit test is specified by arguments and the expected return value.

| Function | Arguments | Expected |  | Function | Arguments | Expected |
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| is\_early |  |  |  | convert\_date |  |  |
| is\_early |  |  |  | convert\_date |  |  |
| is\_late |  |  |  | is\_valid\_day |  |  |
| is\_late |  |  |  | is\_valid\_day |  |  |

7. For each of the functions listed above, how many unit tests would be ideal at a **minimum**? Explain your reasoning for why that minimum number of tests is reasonable.

| is\_early: |
| --- |
| is\_late: |
| convert\_date: |
| is\_valid\_day: |

# 4) Reflect and Review

Discuss among yourselves: what did you learn from this activity? What was surprising or interesting? If you didn’t learn anything, what do you think we were trying to teach you? How could this activity be improved?

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# Final Submission

When your team is happy with your answers for all the questions, download this file as a Word Document (docx) and upload the file to the appropriate assignment on Canvas.

Only one member of your team needs to submit.