INTRODUCTION

Python

Programming Languages

- Computers are built for one purpose - to do things for us
- But we need to speak their language to describe what we want do
- How do we communicate with the computer?
  - *Programming languages*

Python Programming Language

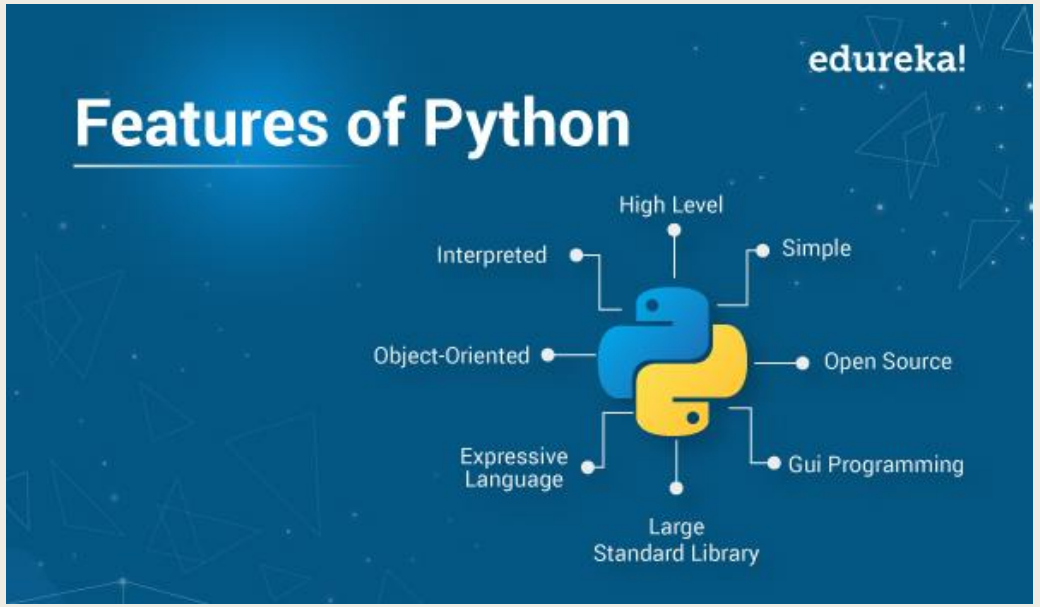
- How did the language Python get its name?
- Named for the British comedy group Monty Python (really!)
- Guido van Rossum invented the Python programming language in early 1990s

Download Python 3.X

- https://www.python.org/downloads/
- There are different versions for Windows, Mac and Linux
- Please download appropriate version for your own computer

Why Python

- Interpretive and object oriented programming language
- Shallow learning curve
- Great support for many different area
- Large community



Interpreted VS Compiled

- Python uses an interpreter, translates high-level language one statement at a time into machine language and then runs
- Check the video → https://youtu.be/I1f45REi3k4
- Check the web → https://www.freecodecamp.org/news/compiled-versus-interpreted-languages/

Machine code	Assembly code	Description
001 1 000010	LOAD #2	Load the value 2 into the Accumulator
010 0 001101	STORE 13	Store the value of the Accumulator in memory location 13
001 1 000101	LOAD #5	Load the value 5 into the Accumulator
010 0 001110	STORE 14	Store the value of the Accumulator in memory location 14
001 0 001101	LOAD 13	Load the value of memory location 13 into the Accumulator
011 0 001110	ADD 14	Add the value of memory location 14 to the Accumulator
010 0 001111	STORE 15	Store the value of the Accumulator in memory location 15
111 0 000000	HALT	Stop execution

Address	Machine Language				Assembly Language
0000 0000	0000	0000	0000	0000	TOTAL .BLOCK 1
0000 0001	0000	0000	0000	0010	ABC .WORD 2
0000 0010	0000	0000	0000	0011	XYZ .WORD 3
0000 0011	0001	1101	0000	0001	LOAD REGD, ABC
0000 0100	0001	1110	0000	0010	LOAD REGE, XYZ
0000 0101	0101	1111	1101	1110	ADD REGF, REGD, REGE
0000 0110	0010	1111	0000	0000	STORE REGF, TOTAL
0000 0111	1111	0000	0000	0000	HALT

Object Oriented Programming Language

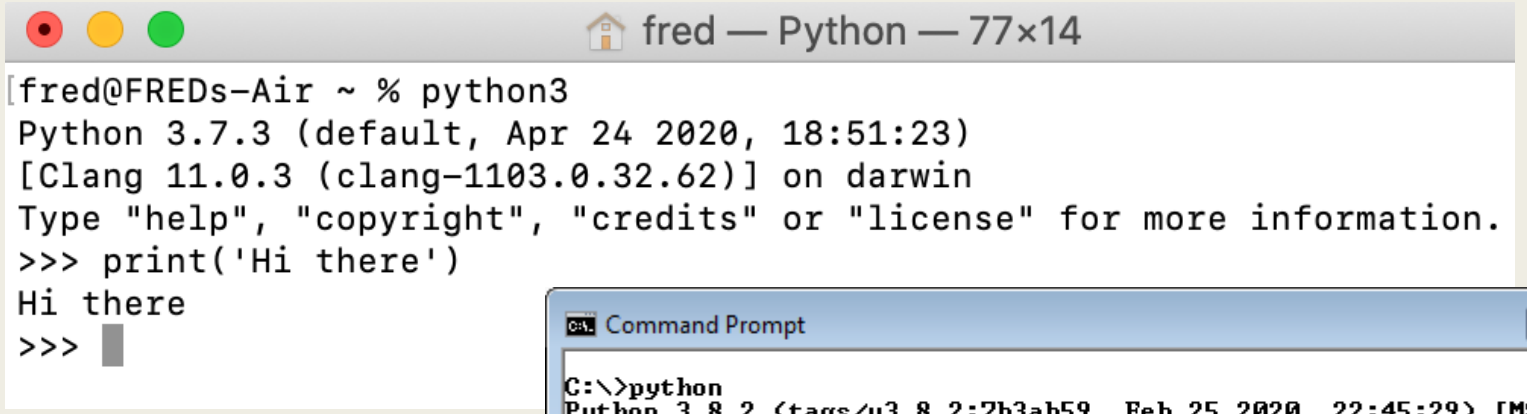
- Use the concept of "objects", which can contain data and code: data in the form of fields (often known as attributes or *properties*) code in the form of procedures (often known as *methods*)
- Check the video → https://youtu.be/m_MQYyJpIjg
- Check the web → https://www.indeed.com/career-advice/career-development/what-is-object-oriented-programming

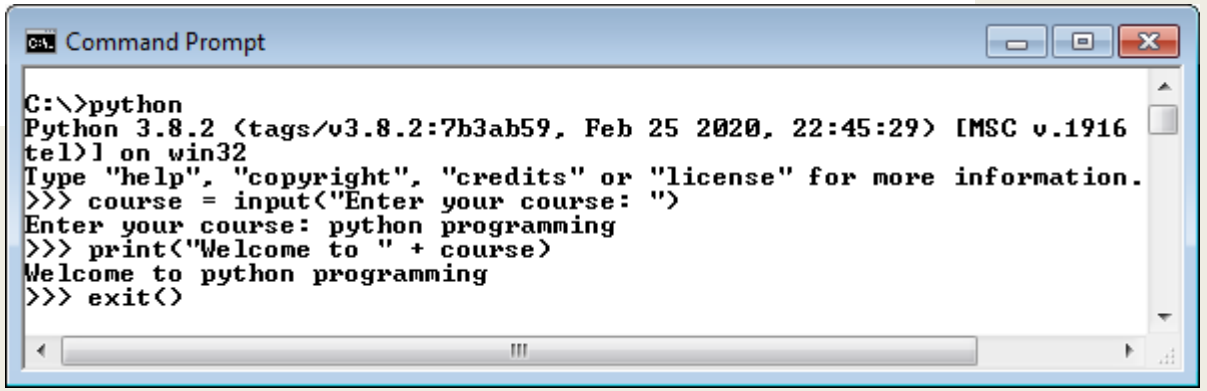
Interactive VS Script

- There are two ways to use the interpreter:
  interactive mode and **script** mode
- **Interactive**
  You type directly to Python one line at a time and it responds
- **Script**
  You enter a sequence of statements (lines) into a file using a text editor and tell Python to execute the statements in the file

Running Code in the Interactive Mode

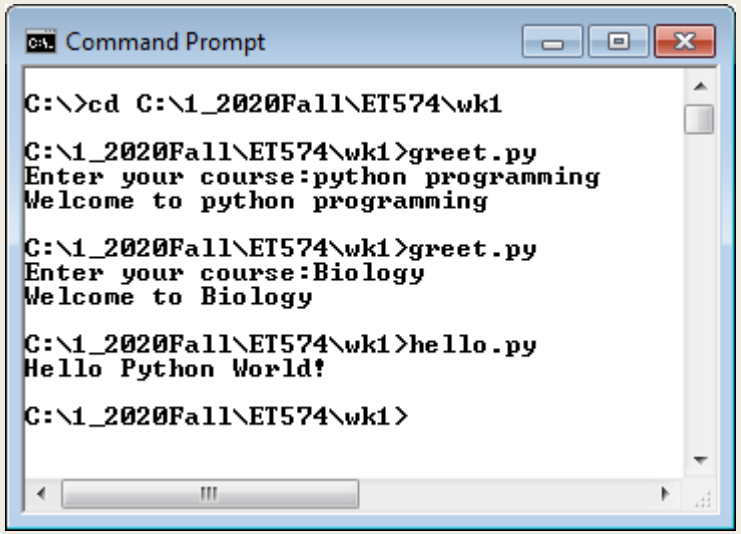
- Interactive Python is good for experimenting with short expressions or statements

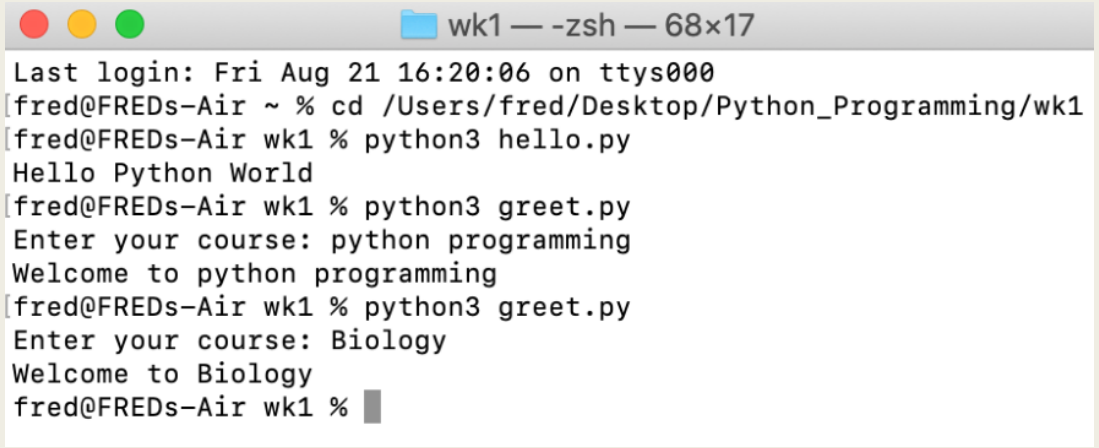




Running Code in the Script Mode

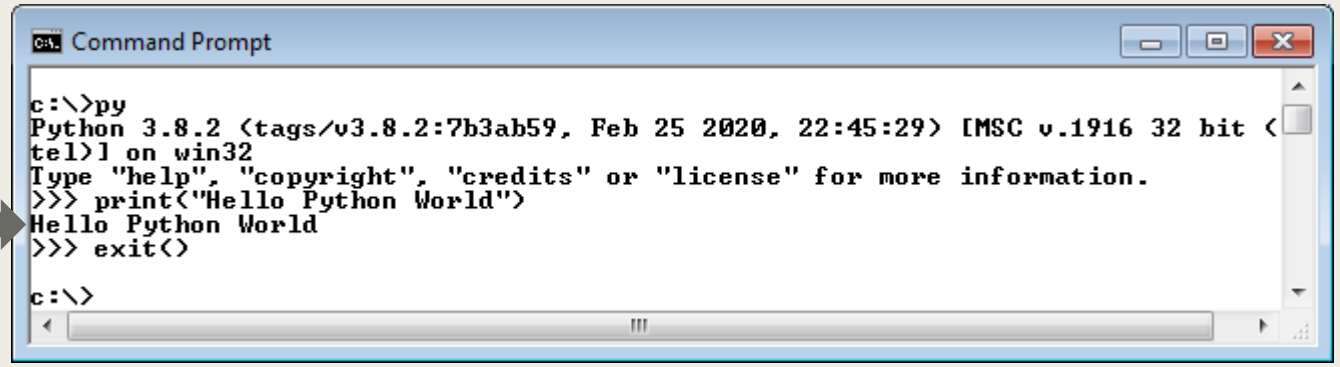
- Most programs are much longer, so we type them into a file and tell Python to run the commands in the file
- As a convention, we add ".py" as the suffix on the end of these files to indicate they contain Python



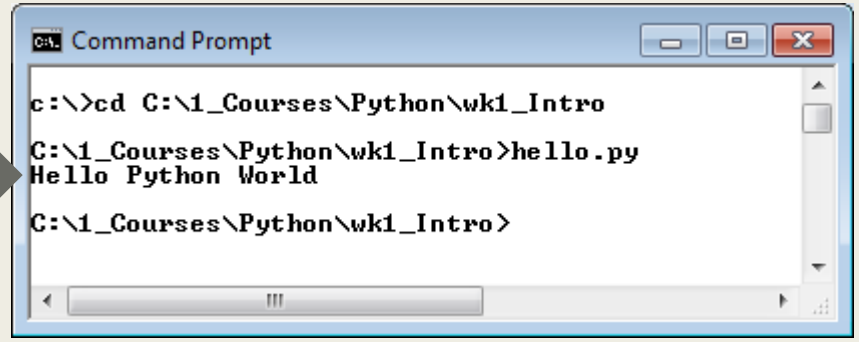


An Example in Command Prompt (Windows)

Interactive



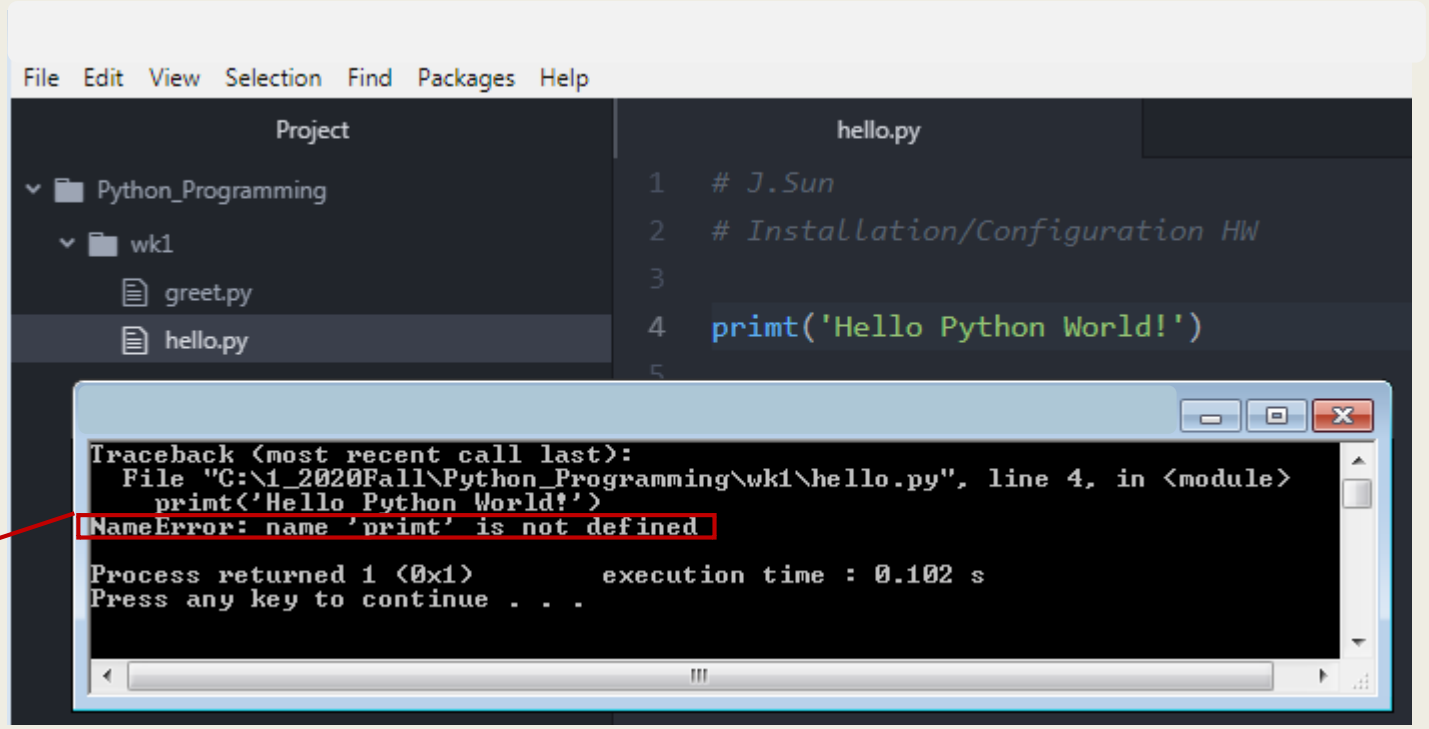
Script



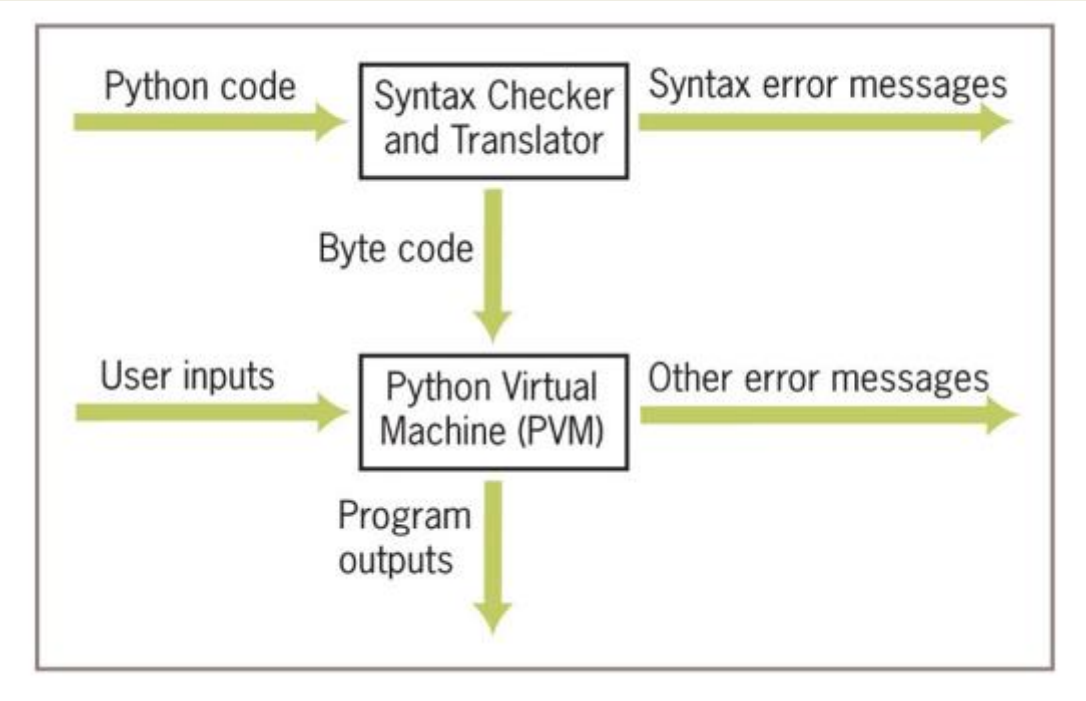
Early Learner: Syntax Errors

- Programmers inevitably make typographical errors when editing programs, called syntax errors
- Syntax: rules for forming sentences in a language
- When Python encounters a syntax error in a program, it halts execution with an error message
- Most programs are much longer, so we type them into a file and tell Python to run the commands in the file

Trackback

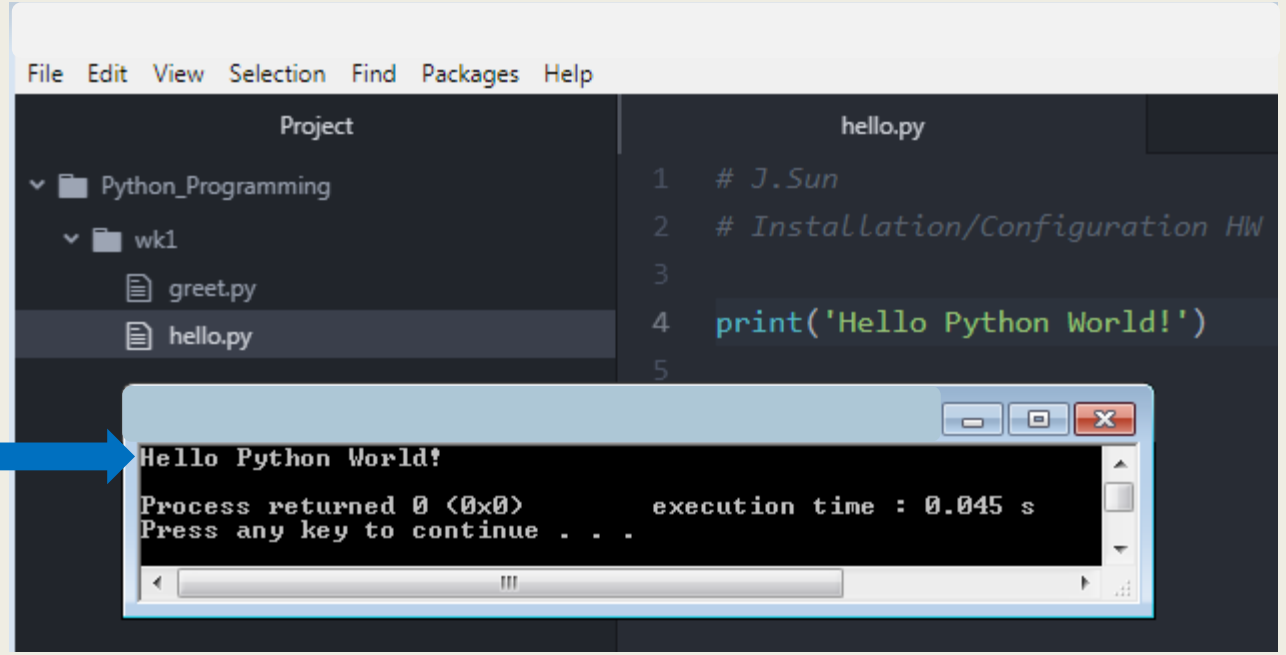

File Edit View Selection Find Packages Help
Project
Python_Programming
wk1
greet.py
hello.py
hello.py
1 # J.Sun
2 # Installation/Configuration HW
3
4 primt('Hello Python World!')
Traceback (most recent call last):
File "C:\1_2020Fall\Python_Programming\wk1\hello.py", line 4, in <module>
primt('Hello Python World!')
NameError: name 'primt' is not defined
Process returned 1 (0x1) execution time : 0.102 s
Press any key to continue . . .
print

Behind the Scenes: How Python Works

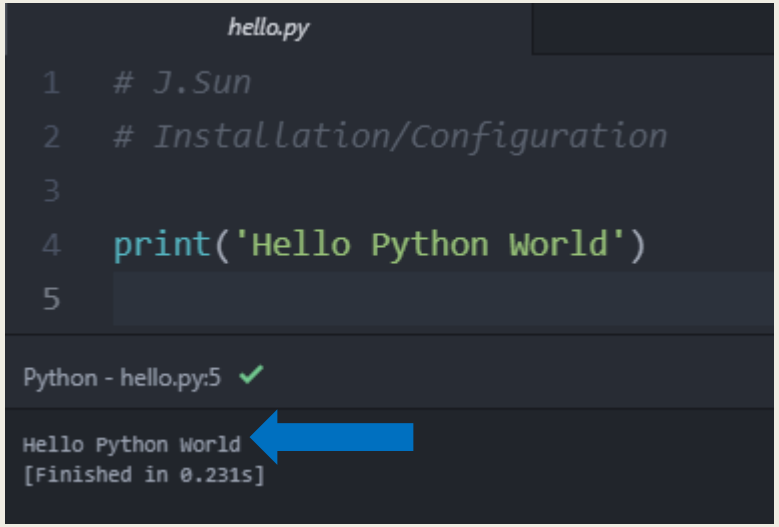


Installation/Configuration

- Use Atom, the text editor, to create the source file (hello.py)
- Run the source code



atom-python-run package



script package

Python Online Editor

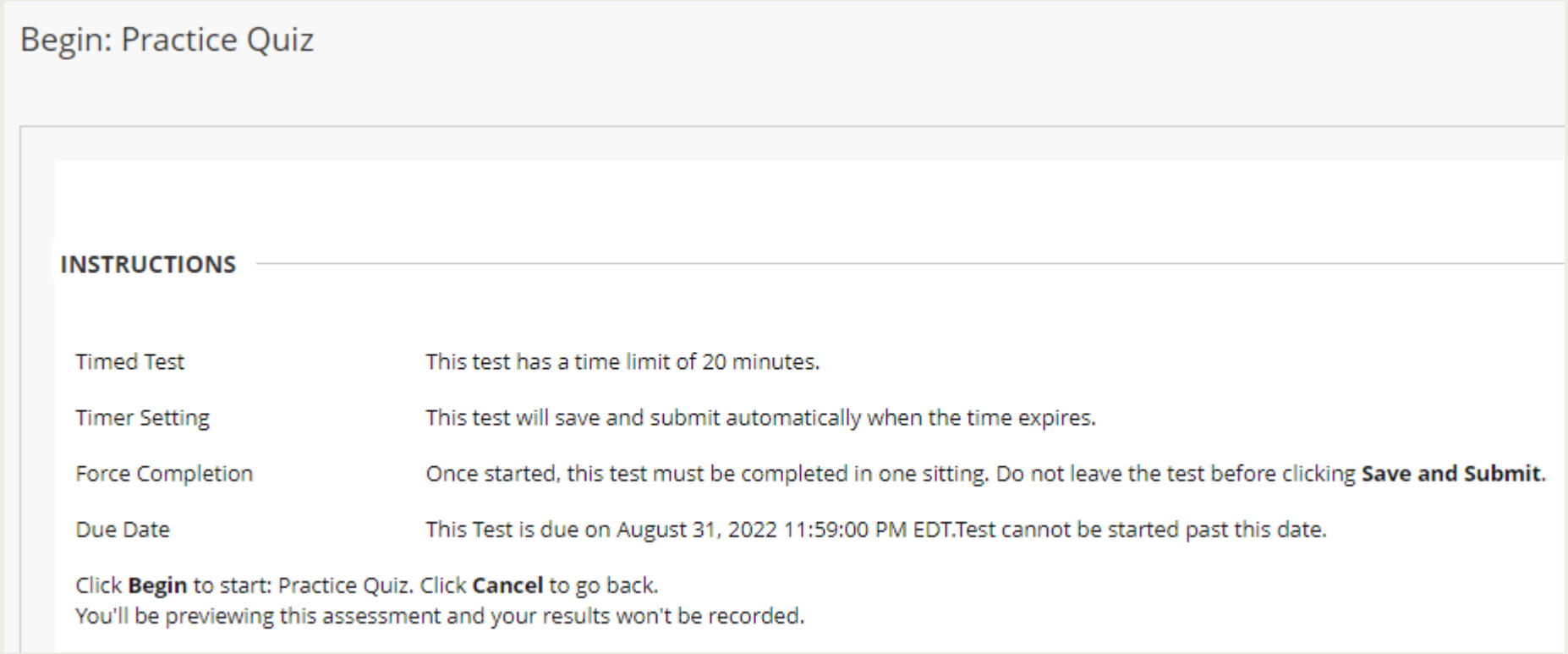
Summary

- Programming languages such as Python are high-level
- Interpreter translates a Python program to a lower-level form that can be executed on a real computer
- Interactive Python shell provides a command prompt for evaluating and viewing the results of Python expressions and statements
- IDE/IDLE is an integrated development environment that allows the programmer to save programs in files and load them into a shell for testing
- Python scripts are programs that are saved in files and run from a terminal command prompt
- When a Python program is executed, it is translated into byte code
  - *Sent to PVM for further interpretation and execution*

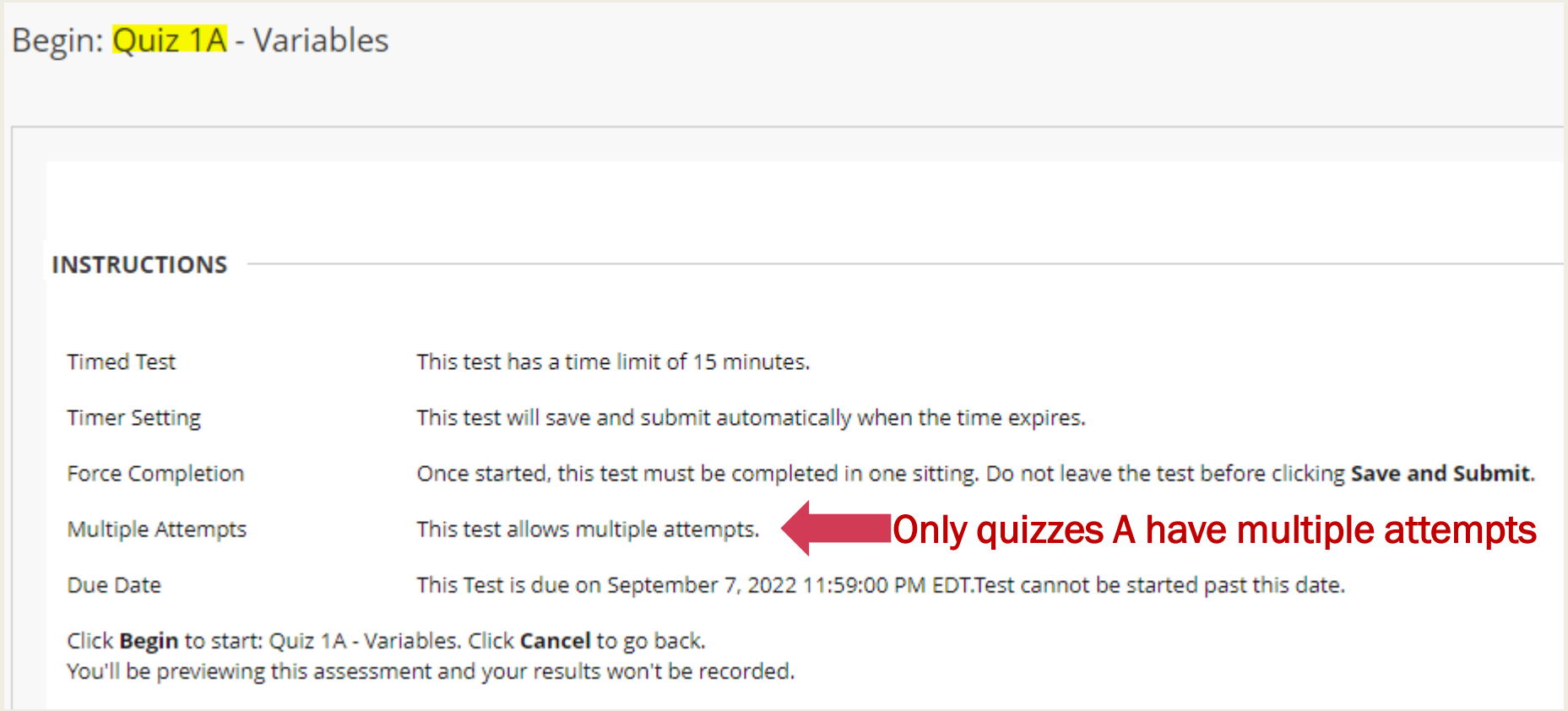
Summary

- Quick overview of Python
- Revisit these concepts throughout the course
- Get your Python Integrated Development Environment (IDE) ready to code

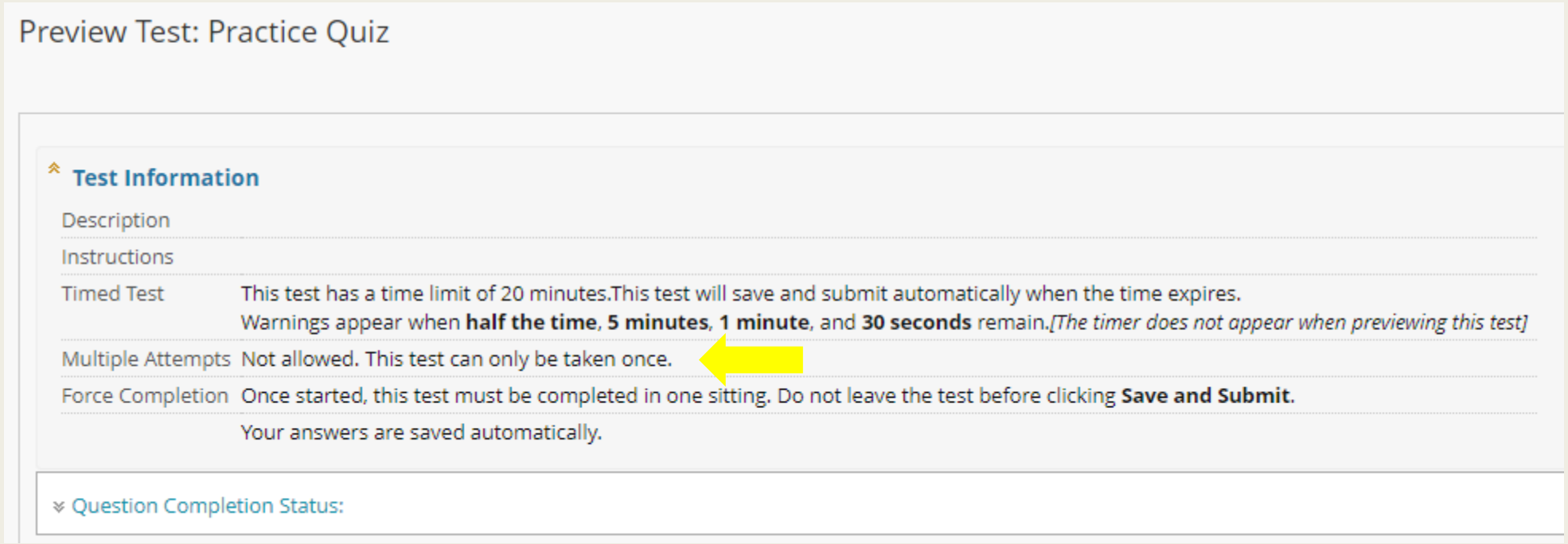
Practice Quiz Instructions



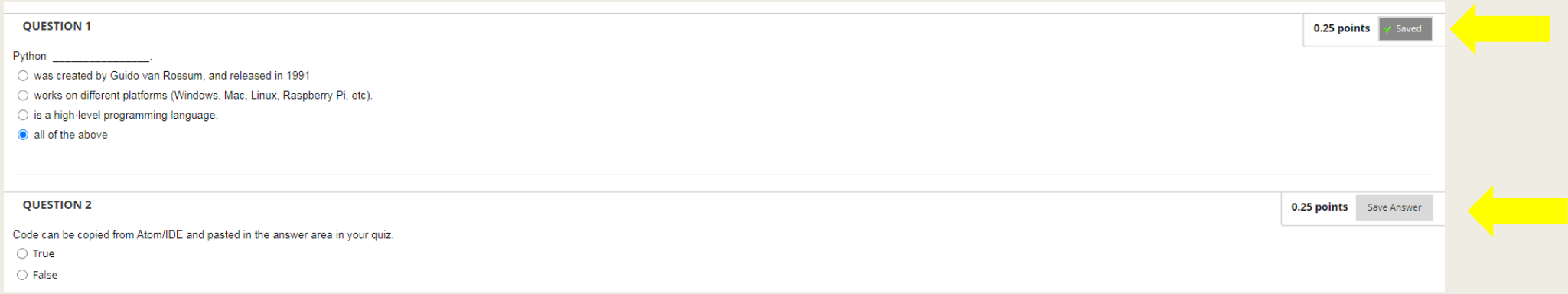
A Quizzes


Begin: Quiz 1A - Variables
INSTRUCTIONS
Timed Test
This test has a time limit of 15 minutes.
Timer Setting
This test will save and submit automatically when the time expires.
Force Completion
Once started, this test must be completed in one sitting. Do not leave the test before clicking Save and Submit.
Multiple Attempts
This test allows multiple attempts.
Only quizzes A have multiple attempts
Due Date
This Test is due on September 7, 2022 11:59:00 PM EDT.Test cannot be started past this date.
Click Begin to start: Quiz 1A - Variables. Click Cancel to go back.
You'll be previewing this assessment and your results won't be recorded.

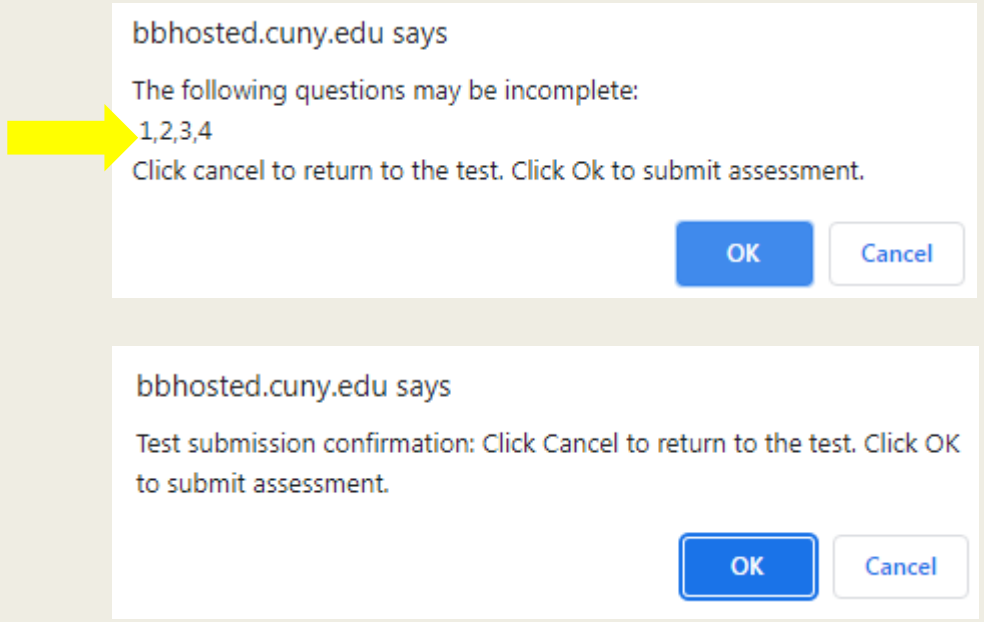
Preview Test

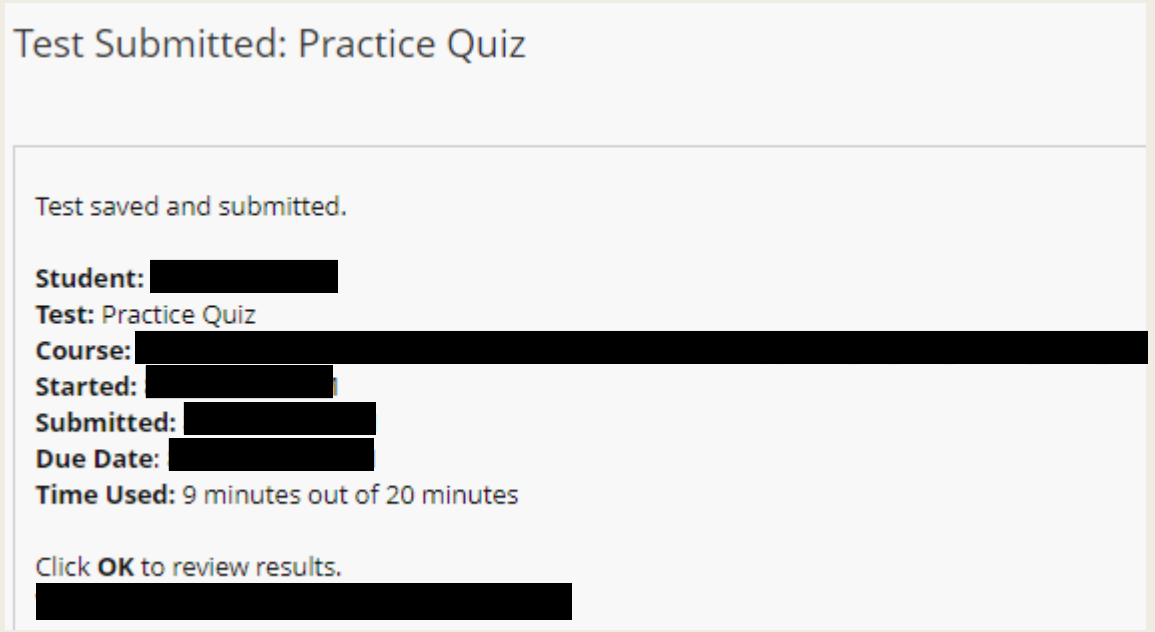


Taking Test

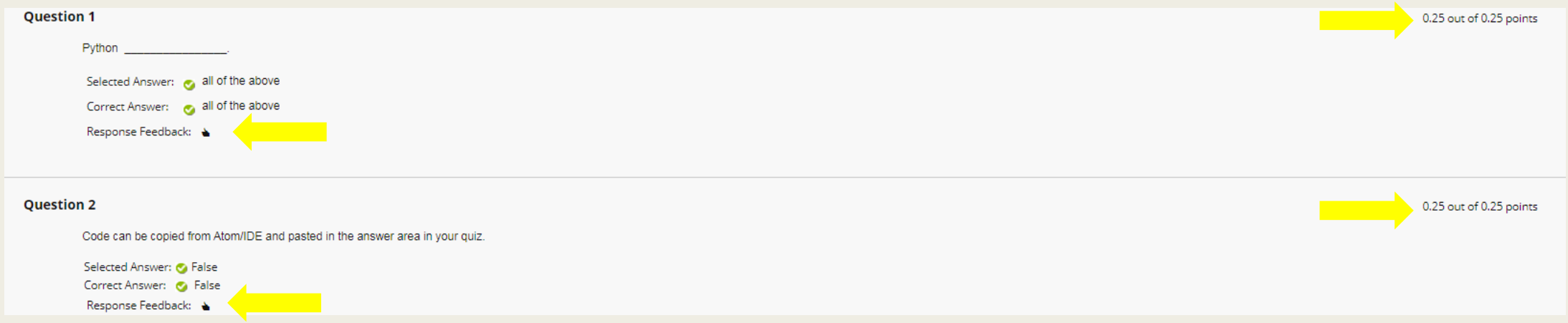

QUESTION 1
0.25 points
Saved
Python _____.
was created by Guido van Rossum, and released in 1991
works on different platforms (Windows, Mac, Linux, Raspberry Pi, etc).
is a high-level programming language.
all of the above
QUESTION 2
0.25 points
Save Answer
Code can be copied from Atom/IDE and pasted in the answer area in your quiz.
True
False

Save and Submit





Review Test Submission (1 of 2)



Review Test Submission (2 of 2)

Status	Needs Grading
Attempt Score	Grade not available.
Time Elapsed	9 minutes out of 20 minutes
Results Displayed	All Answers, Submitted Answers, Feedback

Question 3

0 out of 0.25 points

The missing quiz can be made-up.

Selected Answer: True
Correct Answer: False
Response Feedback: Quizzes must be completed once begin.
Quizzes cannot be made up if missed or an internet/Blackboard error occurs.
Check the syllabus and ET574 Start Here/00 Start Here/Course Documents for more details.

Question 4

Needs Grading

Write **one line** of code to display "*Hello World*" to the output console.

Selected Answer: print("Hello World")
Correct Answer: Use *print()* function and put the displayed text in the quotation marks.
See Ex1_Output.py for more details.
Response Feedback: [None Given]

Assignments

Email & Announcements Confirmation

- Two questions in 10 minutes, 1 pt.
  - Make sure the email address associated with your Blackboard account is correct
  - Check the announcements weekly
  - Submit it **before** the due date

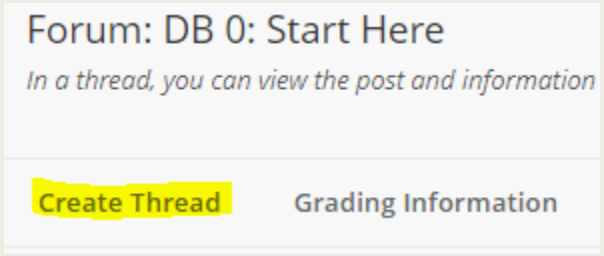
Practice Quiz

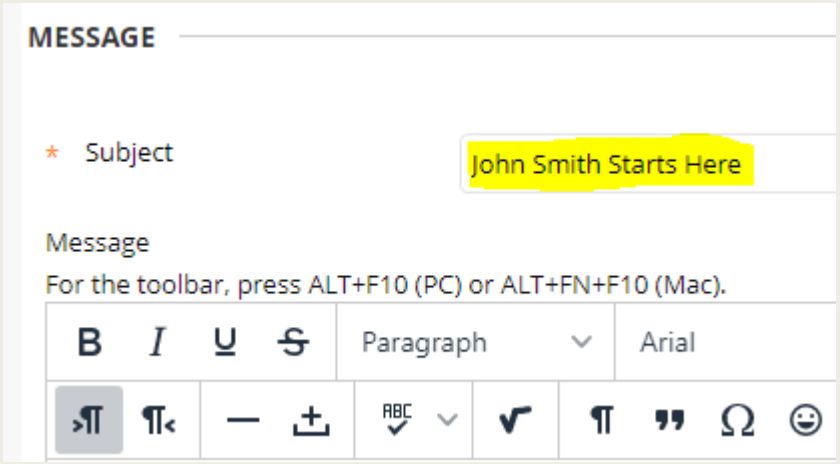
- Four questions in 20 minutes, 1 pt.
  - 0.25 pt. for each question
  - Used as demo purpose
  - Practice Quiz has one attempt
  - Submit it **before** the due date

Discussion Board:
DB 0: Start Here

DB 0: Start Here

Instruction:
1) State your desktop/computer **software package** you've used/installed such as Atom. Or share the web link if you are using Python online (0.4 pt).
2) State the difference between **compiler** and **interpreter** (0.4 pt).
3) Define **OOP** (0.4 pt).
4) After posting your solution, check each other's answers. Please ask questions and/or make at least one **comment** to one of the other responses (0.3 pt).
Submit your posts before the due date.





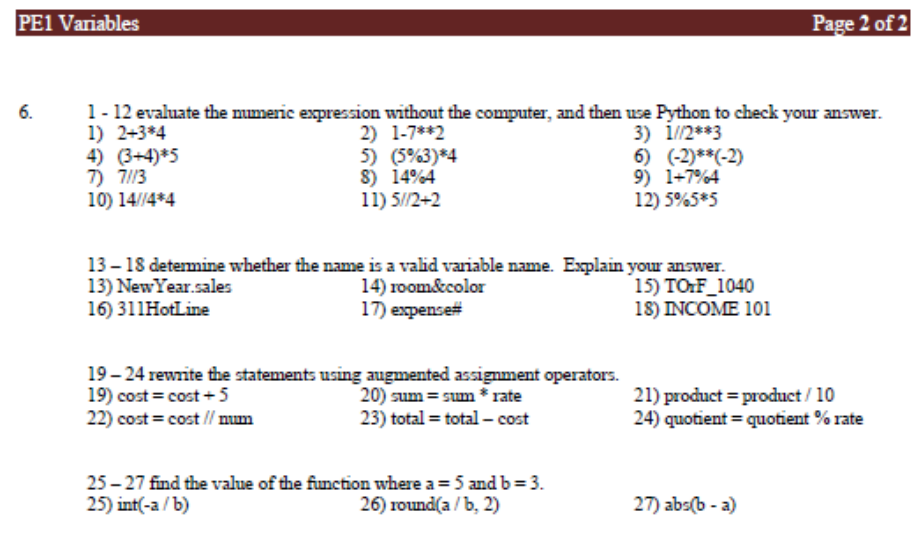
Look Ahead (1 of 2): Quiz 1

- Quiz 1A has 10 questions in 15 minutes, 10 pts, due 11:59 PM on 9/7
  - *10 multiple choice/true or false questions, 1 pt. for each question*
  - *Quiz 1A has two attempt, the higher grade will be selected*
  - *Submit Quiz 1A (at least 1-minute) **before** the due time to Blackboard*

- Quiz 1B has 2 code questions, 15 pts
  - *Write the Python code based on the given question*
  - *Each question will be given during the first 10-minute of each session of week 1*
  - *Quiz 1B-1 on session A, 9/1 and Quiz 1B-2 on session B, 9/6*
  - *Quiz 1B has one attempt*

Look Ahead (2 of 2): DB 1

PE1_6



PE1 Variables — Page 2 of 2

6. 1 - 12 evaluate the numeric expression without the computer, and then use Python to check your answer.

1) 2+3*4	2) 1-7**2	3) 1//2**3
4) (3+4)*5	5) (5%3)*4	6) (-2)**(-2)
7) 7//3	8) 14%4	9) 1+7%4
10) 14//4*4	11) 5//2+2	12) 5%5*5

13 – 18 determine whether the name is a valid variable name. Explain your answer.

13) NewYear.sales	14) room&color	15) TOrF_1040
16) 311HotLine	17) expense#	18) INCOME 101

19 – 24 rewrite the statements using augmented assignment operators.

19) cost = cost + 5	20) sum = sum * rate	21) product = product / 10
22) cost = cost // num	23) total = total – cost	24) quotient = quotient % rate

25 – 27 find the value of the function where a = 5 and b = 3.

25) int(-a / b)	26) round(a / b, 2)	27) abs(b - a)

Make your post

- Instruction:
  1) Choose any **three** question (1 - 27) to complete from PE1_6. Please **avoid** answering the same questions. Make sure to indicate the **question #** you're working on in the thread title as soon as you open your thread. Then you can **write your answer and explain your solution**. Check the class recording for more details (1.2 pt).
  2) After posting your solution, check each other's answers. Please ask questions or make comments (0.3 pt).
  3) Submit your posts before the due date. Let's learn from each other.