

Full Stack Python Programming

Introduction to Digital Technology

Spring Semester 2023 Revision 1, 2 Jan 2023

Standards Mastery Framework Project Sequence

Assignment Pathway

Track 1		
Assignment	Value	Due Date
Python Review & Extension		
0. Hello, World.	Practice	12 Jan
1. Printing	Practice	12 Jan
2. Calculations & Data Types	Practice	12 Jan
3. Procedures	Minor	12 Jan
4. Functions	Minor	19 Jan
5. External Libraries	Minor	19 Jan
6. POCO / OOP	Major	26 Jan
7. Try/Except	Minor	2 Feb
8. Container Classes	Minor	2 Feb
SQL/SQLite 3		
0. Installation & Workbench	Practice	2 Feb
1. Table Builds & Drops	Minor	9 Feb
2. Table Operations	Minor	9 Feb
3. Query Basics: Selections	Minor	9 Feb
4. Insertions	Minor	16 Feb
5. Deletions	Minor	16 Feb
6. Updates	Minor	23 Feb
7. Basic Python Queries	Minor	23 Feb
8. Advanced Python Queries	Major	2 March
GUI/TKINTER		
0 Hello, World (Button)	Practice	9 March
1 Hello World as a POCO	Practice	9 March
2 Tk Interactive	Practice	9 March
3 Menu	Minor	9 March
4 Decorations/Imagery	Minor	16 March
5 Navigation Queries	Minor	16 March
6 Query Displays	Minor	16 March
7 Add/Delete Records	Major	23 March
8 Edit Records	Major	30 March
Master Projects		
0. Proposal	Minor	30 March
1. Code Grade	Major	4 May
2. Presentation	Major	4 May
Final Graded Event		
Final Graded Event	TBA	TBA

Each Section must flow *in order*. Any section may be commenced early and in parallel.

Python Review & Extension

Item	Language Track	Specifications
0	Hello, World	Submit a properly running Hello World Program in Python
1	Printing	Submit a program printing in a properly running program using At least 4 different types of print commands. Example: <ul style="list-style-type: none"> • Printing literals • Formatted printing • Printing multiple variables (several ways) simultaneously in text
2	Calculations/ Data Types	Submit a program performing calculations using at LEAST the following data types: <ul style="list-style-type: none"> • Int • Float • Double • Decimal (or its equivalent) • Long • Byte (Can involve bitwise shifting)
3	Procedures	Submit a program that has multiple procedures existing outside but called from the main method
4	Functions	Submit a program that has multiple functions existing outside but called from the main method
5	External Libraries	Submit a program that links in 3 external libraries you use in your code
6	POCO/OOP	Write a POCO class and instantiate it at least three times in your main application
7	Try/Except	Write a program that uses try/except clauses to catch errors. Show one error being caught in your run sheet/run check
8	Container Classes	Write a POCO Class, then instantiate a container in your main program that holds multiple objects of your class. Demonstrate CRUD on the objects in memory

SQL/SQLite 3

Item	Database Track	Specifications
0	SQLite3 Installation	Prove proper installation of SQLite 3 and any tool to allow you to manually operate databases
1	SQL Table Builds/Drops	Submit your SQL queries that resulted in proper formation of your desired schema (table)
2	SQL Table Operations	Demonstrate SQL queries that add columns, remove columns, and edit data types of columns
3	SQL Query Basics - Selections	Demonstrate multiple selection queries varying records and what is returned to the result set
4	SQL Insertions	Demonstrate multiple SQL insertions
5	SQL Deletions	Demonstrate proper SQL deletions
6	SQL Updates	Demonstrate proper SQL updates to multiple records
7	Basic Python SQL Queries	Demonstrate connecting to your SQLite 3 from a python POCO class
8	Advanced Python SQL Queries	Demonstrate using the data from an SQLite3 query call in your python POCO in the main part of your program

GUI/TKINTER

Item	GUI Track	Specifications
0	Tk Hello, World (Button)	Submit a properly running Hello World Program in Tk for Python
1	Tk Hello World as a POCO	Submit your Tk Hello World as a POCO instantiated in main
2	Tk Interactive	Write a Tk program that allows user to interact with at least: <ul style="list-style-type: none">Buttons that change labelsButtons that read and write to text edit fields
3	Tk Menu	Write a Tk Menu that performs basic application functionality including: File-> Exit Help->About (With an actual popup menu) 3 other functions you write
4	Tk Decorations/Imagery	Demonstrate tk decoration by using images as backgrounds and set the application icon
5	Tk Navigation Queries	Navigate through a container object using tk buttons
6	Tk Query Displays	Connect the data object to your database class and show records on a tk GUI screen using navigation buttons
7	TK Add/Delete Records	Install SQLite3 methods to your db POCO and perform Add/Deletes from your GUI class
8	TK Edit Records	Perform Edits on record with navigational focus

Master Projects

Once you are completely signed off for all three tracks, you can proceed to your master project proposals. Your master projects require a unique topic of interest to you. Common ideas will not score as well. This must be uniquely your own.

What you will submit as your proposal is a 1-page detailed **word-processed** proposal using the template at the end of this packet. Hand-written proposals **will not be accepted**.

April 11 th	Master Project Proposals Due
May 4 th	Master Projects Due

Specifications

This Master Project will receive **three** total grades: 1 minor, 2 major.

Item	Value
Proposal	Minor
Master Project Code	Major
Master Project Presentation	Major

The operative goal for the Spring semester is to achieve a very simple User Interface Python program with fundamental CRUD access into an SQLITE single table.

CODE Major Grade Required minimums (Major Grade Number 1):

- Must be OOP Python with operable UI w/Menu (UI Class is NOT main module)
- Help About Dialog
- Must connect to an SQLite3 Table
- Must display data from the table

Meeting minimums achieves a grade of **70**.

Code Grade Enhancers: To achieve each tier, ALL of the lower tiers must be achieved.

To achieve an 80 or better, code must include the following minimums:

- Must include background imagery
- Must have a full working menu as shown in class (If not sure ASK)
- Must complete CRUD operations as directed by user in some manner

To achieve a 90 or better:

- Must have a class modeling the data used in transfer to/from the table (See example)
- Must have full CRUD operations (CREATE, READ, UPDATE, DELETE)
- Must accompany a proposal that scores above a 90

To achieve above a 95:

Your program must be comprehensively produced and show significant programmatic prowess. One of the biggest ways to guarantee this after meeting the 90% minimums, is to place your table on the lab cloud, and be able to connect remotely to it. This can be a copy of your table. Connection strings will be explained in class.

Presentation & Demonstration (Major Grade Number 2)

- Presentations will be done to the entire class
- This major grade will include all of the final elements:
- Professional Dress
- Comprehensive DEMO
- Demo functions properly
- Presentation clarity (Do you stay on point and relevant to the demo of your software)
- Demonstration of why this is meaningful to you beyond mere statement of such
- 2 words per slide rule adherence

Code Point Deductions

- Multiple Page PDF submissions
- File format not PDF (other than PDF except for required imagery)
- Non scannable code results in a zero until resubmitted. If late, school board deductions in effect
- Incorrect Order of submission (Classes, Main, Schemas, Run/Images)
- Missing submissions
- Poorly documented code
- Non-meaningful code
- Non-Working Code
- Late code in accordance with school board policy at all deadlines
- Default Recovery by definition is to submit in accordance with this document unless otherwise directed

Introduction to Digital Technology

[Replace this text with your full name]

Period: [1 or 3]

Master Project Proposal

Date Submitted: [DD Month-Spelled-Out YY]

What I am managing or tracking

[1-2pp]

Why this is meaningful to me

[1-2pp]

Attestation: By signing below I attest that I will write my own code. I will only allow others to help me understand my errors or generically perform a single specific task. All my code will be uniquely my own. My database queries and GUI construction will all be my own. I am aware that all code submissions will be digitally scanned for similarities and any source codes I submit will be in a scannable colorized PDF to Microsoft Teams. I fully understand that this project is a major assessment, and that plagiarism will result in disciplinary action.

Date Signed

You may either add a digital signature or type your full name. By typing your full name, you are attesting the above acknowledgements.