Crypto Currency Converter
CS 5001 Intensive Foundations of Computer Science

1. Goals

- Explore correct variable creation and usage
- Use basic math expressions to solve a problem
- Create a menu driven program
- Research new commands on your own
- Use already learned concepts
- Simple selection
- Simple testing

2. In Recitation

Objective 1 : Explore the Terminal Within Visual Code

A terminal is a text-based method of using your computer that is much more powerful than using the restricted point and click interface. You can use the terminal interface in VS Code, or you can use a separate terminal application like PowerShell on Windows or Terminal on MAC. I'd like you to at least become comfortable with the terminal shell within Visual Code. What as your TA demonstrates the following commands:

```
cd
cd ~
cd ..
cd ../../
cd blah
cp
rm
mv
ls
pwd
cat
echo
echo content > file.txt
```

For your ICE, describe what each command does.

Objective 2 : Create a Menu Driven Program

Work together in teams or with your TA. Have your application print a menu that will allow the user to select three options 1, 2, or 3. Have each numeric option match one of the following practice problems of your choosing.

Now implement the practice problems you chose as options. Feel free to implement more than three.

Practice Problem 1: Rectangle

Write a program that reads the length of a rectangle's sides and then prints

- the area and perimeter of the rectangle
- the length of the diagonal (use the Pythagorean theorem)

Hint: you can calculate the square root of a number by raising it to the 0.5 power. For example:

```
Enter width: 9
Enter height: 3
The area of the rectangle is 27.0
The perimeter of the rectangle is 24.0
The diagonal is 9.486832980505138
```

Practice Problem 2: Price per liter

Suppose you are at the grocery store to buy soda and you want to get the best deal. Write a program that reads in the price of a six-pack of soda and the price of a two-liter bottle. The program should print out the price per liter for both assuming that cans are 12 oz or 0.355 liters. For example:

```
Price per six-pack: 2.75
Price per two-liter: 1.74

Six-pack price per liter: 1.2910798122065728
Two-liter price per liter: 0.87
```

Practice Problem 3: Length

Write a program that reads a measurement in meters and then converts it to inches, feet, and miles. There are 39.3701 inches in a meter. For example:

```
Enter length: 42
The length in inches is 1653.5442
The length in feet is 137.79528
The length in miles is 0.026097582
```

Practice Problem 4: Bookends

Write a program that reads a 4-digit number from the keyboard and prints the first and last digits of the number. For example,

```
Enter number: 1234
The first number is 1
The last number is 4
```

Practice Problem 5: String Equality

Write a program that reads in a word from the keyboard and prints "Hi, how are you" and "Done" if someone enters the word "Hi" (capitalization matters). Otherwise it just prints "Done". For example,

```
Hi
Hi, how are you?
Done

Bye
Done
```

Practice Problem 6: Clamping

Write a program that reads in a number from the keyboard. Your program should ensure that the value entered is between 1 and 100 by *clamping* it and then print it to the screen. *Clamping* a number means that any value less than the lowest value is set to the lowest value and that any value larger than the largest value is set to the largest value.

Examples:

```
Enter value: 103
Too big, clamping required
Value is 100

Enter value: -12
Too small, clamping required
Value is 1

Enter value: 42
Value is 42
```

Note: These starter assignments are meant to help you get started with each assignment by allowing you to code as a group and provide each other assistance. Make sure you understand everything that you code.

For your ICE, submit the code for your solution. Your team may submit all the same code, but each team member needs to submit. Make sure you have the name of everyone who worked on the assignment in the header.

3. **Lab Assignment Instructions:**

Prompt the user for a currency amount and save that amount in `amount`:

```
Please enter a currency amount :
```

Print the following menu:

```
Amount entered was in what form?
Enter :
USD
BitCoin
Ethereum
```

If the user enters anything, but 1,2, or 3 terminate the program. (You'll need to research this.)

Store the selection in "`currency_in`"

Print the following menu:

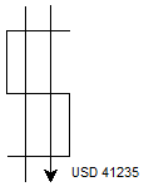
```
Convert the entered amount to what form?
Enter :
   1. USD
   2. BitCoin
   3. Ethereum
```

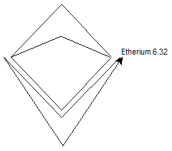
If the user enters anything, but 1,2, or 3 terminate the program. (You'll need to research this.)

Accept from the user a currency amount. Store this amount in "`convert_to`."

Convert the amount based on the current day's conversion factor. (You'll have to do some research.) Save this result in "`final_amount`."

Create a turtle window with a basic logo for the final amount and the result. Have the logo match the converted to type. Examples:





Hints:

- Work smarter not harder when drawing or writing text. See what turtle commands might help you.
- Draw out your logos first on graph paper.
- Your logos don't have to be perfect. I mean look at my examplesl
- You can return to home position to continue drawing if it makes life easier.
- Make sure to look at what penup and pendown does.
- The "and" operator can make your code neater when figuring out selections.
- Comment your code well and divide into blocks of drawing explaining what each block does. That'll help you in the long run.
- Watch out for indentions.

Make sure your code is well commented and uses the correct Python style.

Take a screenshot(s) of three trial runs. One with each logo.
Take a screenshot(s) showing the extensions you did.

4. **Extensions suggestions:**

Projects are your opportunity to learn by doing. They are also an opportunity to explore and try out new things. Rather than list out every activity for a project, the defined part of each project will be about 85% of the assignment. You are free to stop there and hand in your work. If you do all of the required tasks and do them well, you will earn a B/B+.

The following are a few suggestions on things you can do as extensions to this assignment. You are free to choose other extensions, and we are happy to discuss ideas with you. Be sure to save and include pictures of your extensions in your report.

- Make much nicer logos than mine
- Add color to the logos
- Add an additional conversion(s)
- Get fancier with the text output
- Look ahead and figure out how to use functions to reduce your code

5. **Report:**

Your report is primarily intended to demonstrate that you have completed all the tasks and to show your images. There are six sections that need to be included in this week's report. The report is worth 4 points of your project grade. You may use a word processor of your choice, but please submit your report as a pdf with the name report02.pdf along with your code.

1. **Flow chart** Create a flowchart showing your logic. I'm not expecting a specific style. There are plenty of online creators that will help with the creation or it can be hand drawn and photographed.
2. **Required Task Elements** Include all requested screenshots. Each one should have a brief statement about what it is showing.
3. **Extensions** Describe any extensions you did for this project so that you get credit for them. Include images or outputs that demonstrate your extension works.
4. **Tests** Create a table showing you tested all possible scenarios at least once. Your table should have actual input, expected output, and pass/fail.
5. **Grading Statement** (optional) Using the rubric, what grade do you think you deserve and why?

6. **Submission:**

You should be submitting at the least:

- Report02.pdf
- cryptoConversion.py

Submit your project code on canvas as Lab2_"Your_name".zip

When you submit, double-check the following.

- ☐ Is your name and an appropriate header at the top of each Python file?
- ☐ Does every function have a comment or docstring specifying what it does?
- ☐ Does your report have all six sections completed?
- ☐ Is your report a pdf document?

7. **Rubric:**

	Possible	**Given**
Main Objectives		
Gather user input correctly	4	0
Uses menus as requested	4	0
Converts as requested	3	
Prints logos	3	0
Terminates on incorrect input	3	
Misc		
Report (all or nothing)	5	0
Code Quality (correct indentation, comment blocks, variable naming, etc)	4	0
Not included in total possible:		
Extensions (Not calculated without report)	4	0
Creative or went above and beyond	4	0
Code does not compile	-30	0
Late penalty	-6	0
Not implemented as requested	-30	0
TOTAL POINTS POSSIBLE out of 30	26	0