



# uOttawa

## **ITI 1120 E - Assignment 1**

*Due on January 25, 2023, At: 11:59 pm*

*Total number of points: 25  
Assignment 1 is worth 5% of the final mark.  
No late assignments will be accepted.*

The goal of this assignment is to learn and practice (via programming) the concepts that we have learned so far: numbers, algebraic expressions, Boolean expressions, strings, operations on strings, type conversion, variables, use of Python's built-in functions including input and output functions, designing your own functions, documenting your own functions via docstrings, and testing your functions.

Before you can start this assignment, you need to know how to use a (IDLE's) text editor to edit python modules (i.e., files) as well as how to use python shell interactively to test your code. Submit your assignment by the deadline via Brightspace (as instructed and practiced in the first lab.) You can make multiple submissions, **but only the last submission before the deadline will be graded.**

**IMPORTANT NOTE** for this and future assignments: Your grade will partially be determined by automatic (unit) tests that will test your functions. All the specified requirements below are mandatory (including function names, and the behaviour implied by examples in Section 2). Any requirement that is specified and not met may/will result in deduction of points. Your all assignments will be graded in similar way. The assignment has 5 programming questions (in Section 1 below). Each question asks you to design one function. Put all these functions (for all the questions below) in **ONE** file only, called `a1_XXXXXX.py` (where XXXXXX is replaced with your student number).

In addition to `a1_XXXXXX.py` you must submit one more file called `a1_XXXXXX.txt` which contains the results of your tests in file `a1.txt`.

Put these two required files into a folder called `a1_XXXXXX` where you changed XXXXXX to your student number, zip that folder (do not use rar compression format) and submit it as explained in Lab 1. Submit that compressed folder by the deadline via Brightspace.

Your program must run without syntax errors. In particular, when grading your assignment, TAs will first open your file `a1_XXXXXX.py` with IDLE and press Run Module. If pressing Run Module causes any syntax error, the grade for the whole assignment will be zero. If there are no errors, they will start testing your code

Furthermore, for each of the functions below, I have provided one or two tests to test your functions with. For example, you should test question 1 by making function call `reverse_int()` in the Python shell. To obtain a **partial** mark your function may not necessarily give the correct answer on these

tests. But if your function gives any kind of python error when run on the tests provided below, that question will be marked with zero points.

After reading each of these questions once, go to the Section 2: "Testing your code" below and see what the output of your function should give. In that section, you can find a couple of function calls and the required results for each question. Studying these example function calls will help you a lot to understand what each individual question requires, or rather what its function should do. To determine your grade, your functions will be tested both with examples provided in Section 2: "Testing your code" and with some other examples. Thus, you too must test your functions with more example than what I provided in Section 2.

Each function must be documented with **docstrings** (as will be explained upcoming lecture). In particular, each function has to have docstrings that specify: - type contract - description about what the function does (while mentioning parameter names) - preconditions, if any

The purpose of this assignment is to practice concepts that you have only seen in the first 3 weeks of class. Thus, this assignment does not require use of loops, if and other branching statements, lists ... etc. Thus, you must solve the questions below without loops, if and other branching statements, lists etc. Question that breaks this rule will receive zero since they suggest that the required understanding of the material covered in first 3 weeks is not attained.

Global variables are not allowed. If you do not know what that means, for now, interpret this to mean that inside of your file a1\_XXXXXX.py variables can only be created (i.e., assigned value) inside of the bodies of your functions. To avoid confusion, unless otherwise specified in the questions here is what you can use in this assignment:

- comparison operators: <, <=, ==, !=, >, >=
- Boolean operators: and, or, not
- Arithmetic operators: +, -, \*, /, \*\*, %, //
- The following Python built in functions: print, input, round, len, int, float, str
- String operators: +, \*
- Any function from the math module (recall import math, dir(math), and then you can call help on any function in math module. e.g. help(math.sqrt() )
- keywords: def, return

***Note that we will be using a plagiarism detection tool. In case two assignment solutions are identical or very similar, the mark will be zero for both students.***

=====\*\*\*\*\*=====

=====\*\*\*\*\*=====

# Section 1: Assignment 1 questions

## Question 1. (5 points)

Implement function `reverse_int()` that takes a three-digit integer as input and returns the integer obtained by reversing its digits. For example, if the input is 123, your function should return 321.

You are not allowed to use the string data type operations to do this task. Your program should simply read the input as an integer and process it as an integer using operators such as `//` and `%`. You may assume that the input integer does not end with the 0 digit.

=====\*\*\*\*\*=====

## Question 2. (5 points)

Write a Python function called `finalMark` that calculates your **final mark** in ITI1120 (**not** the average mark). Each mark has a different weight: labs: 10%, Assignments: 20%, Test1: 10%, Midterm: 20%, Final: 40%) in our course. The function takes 5 variables as inputs (numbers up 100) and returns that mark.

- The type contract is: (float, float, float, float, float) -> float

=====\*\*\*\*\*=====

## Question 3. (5 points)

Write a function `bibformat(author,title,city,publisher,year)` that takes 5 inputs and returns a string of the form: author (year). title. city: publisher.

- See below for some examples of how your function must behave.
- The type contract of the function is: (str,str,str,str, int)-> str.

=====\*\*\*\*\*=====

## Question 4. (5 points)

Write a function `bibformatPrint()` that prompts the user for a book title, name of the author, year of publication, publisher and the headquarter city of the publisher. The function should then print the information about the book in the same format as specified in the previous question.

- (To do that, your solution must make a call to `bibformat` function from the previous question to obtain a string that you then print).
- The type contract of the function is: ()->None.

=====\*\*\*\*\*=====

## Question 5. (5 points)

Write a Python function called `travelTime` that takes two inputs (the distance to drive in kilometers and the speed of driving in km/h) and returns the time needed for the drive-in minutes.

- The type contract of the function is: (float,float)->float. This means that the two variables that come as inputs are real numbers and the result is also a real number.

=====\*(((((( ( Here is the end of the questions ) )))))\*=

## Section 2: Testing your code

**Test all the functions** in the Python interpreter and add the results in the file a1.txt

- Copy and paste in the file **a1\_XXXXX.txt** when you test each function in the interpreter. Your file a1.txt should look something like the following.
- **IMPORTANT:** Test with other values too.

### #test Q1

```
>>> reverse_int(123)
321
>>> reverse_int(908)
809
>>> reverse_int(112)
211
```

### #test Q2

```
finalMark(100,100,100,100,100)
100.0
finalMark(50,90.5,60,80,70)
74.32
```

### #test Q3

```
bibformat("TahaHussein", "Days", "Egypt", "ARN", 1967)
'TahaHussein (1967). Days. Egypt: ARN'
```

### #test Q4

```
bibformatPrint()
Enter the name of the author: TahaHussein
Enter the title of a book: Days
In what city are the headquarters of the publisher? Egypt
Enter the name of the publisher: ARN
What year was the book published? 1967
TahaHussein (1967). Days. Egypt: ARN
```

### #test Q5

```
travelTime(400,100)
240.0
travelTime(20.6,60)
20.6
```