# Computational Thinking MSCI:3020

**Homework Assignment #1**

**Due:** Friday, September 20th, 2019 @ 11:59 pm

**Problem: Student Loan Interest (5 points)**

Part A: Calculating total amount owed after graduation (2 points)

* Use input() to set variables float variables **loan\_per\_year** and **interest\_rate** and int variable **years**.
* You will need two other variables:
  + **total\_owed** = 0
  + **counter** = 0 (This is a counter variable to count how many times the loop has been executed)
* Construct a while loop that calculates how much you will owe by graduation.
* Each year, you will add the **loan\_per\_year** to your **total\_owed** and multiply by the **interest\_rate**
* The while loop will end when your **counter** is equal to your **years**.

**Example input:**

Number of years: 4

Loan amount per year: 4000

Interest rate (Ex. 0.045 for 4.5% annual): .05

**Example output:**

Total Owed At Graduation

$ 18102

Part B: Determine if monthly payment is feasible (1 point)

* Below the code for Part A, use input() to set float variable **monthly\_payment.**
* Use *if/else* logic to check if the monthly payment would be possible. For example, if your interest accrued each month is more than your monthly payment, then you would be paying off your loan forever. Print whether it is possible with the monthly payment entered as well as the minimum monthly payment needed to not have your loan grow.

(Hint: Your monthly interest rate is your annual interest rate divided by 12.)

**Example input:**

Name a monthly payment: 300

Name a monthly payment: 50

**Example output:**

A monthly payment of $300 will work!

The minimum monthly payment for this loan would be 75 dollars.

A monthly payment of $50 won’t work! You’ll be paying off your loans forever.

The minimum monthly payment for this loan would be 75 dollars.

Part C: Determine how long it will take to pay off your student loans (2 points)

* Using your variable **monthly\_payment** from Part B, now calculate how long it will take to pay off your student loans.
* Use a while loop that will continue to run until the total\_owed is less than or equal to 0.
* You will also need an integer counter variable **month** that keeps track of how many months have passed (how many times the loop is run)
* In the loop,
  + Subtract the monthly payment
  + Add back interest accrued that month
  + Add one to the counter variable **month**

Print out the number of months and years it will take to pay off the loans. Note, you do not need to count partial months and the number of years do not need to be formatted.

**Example output:**

It will take 70 months to pay off your student loans.

It will take 5.833333333333333 years to pay off your student loans.