ENGR 102 – Programming Practice
Practice Session (Week 14)

In this practice session, you will learn how to use map, reduce and filter built-in functions within lambda functions, and have a chance to practice what you have learnt on small problems.

Q1- Write a map function that applies the following function to elements of my_list. Then write an alternative method using lambda function.

```
def multiply2(x):
    return x ** 2
my_list = [2, 3, 4, 6, 8]
```

Q2- Imagine you have word location dictionary for a specific document and you want to convert it into a word frequency dictionary. Using map function calculate word frequencies of each word. Try to create your new dictionary in one line.

```
word_location = {'my': [0, 30, 45], 'life': [3, 35], 'computer': [13, 22, 38], 'I': [5, 27, 46, 89]}
```

Q3- Eliminate odd numbers from the following list using filter and lamda functions.

```
numbers = [0, 3, 5, 7, 8, 10, 30, 45]
```

Q4- Convert the following list into a new list where it contains only dictionaries that have 'CS' as a department.

```
courses = [{'name': 'Computer Systems', 'department': 'CS'},
           {'name': 'History of Cinema', 'department': 'CTV'},
           {'name': 'Database Systems', 'department': 'CS'},
           {'name': 'Microprocessors', 'department': 'EE'},
           {'name': 'Late Ottoman History', 'department': 'HIST'}]
```

Q5- Write a code that do the same thing with the following codes. Use lambda and reduce functions.

```
product = 1
list = [1, 2, 3, 4]
for num in list:
    product = product * num
```

Q6- In Question 2, you created a word frequency dictionary using word_location dictionary. Now, use the word_location dictionary to create a new dictionary where keys are words and values are sum of the word's locations.

Q7- Revise the practice session of Week 5 (i.e., calculator) so that it takes advantage of lambda functions in button events as much as possible.