Assignment

1. Chebyshev polynomials are defined recursively. Chebyshev polynomials are separated into two kinds: first and second. Chebyshev polynomials of the first kind, $T_n(x)$, and of the second kind, $U_n(x)$, are defined by the following recurrence relations:

$$T_n(x) = \begin{cases} 1 & \text{if } n = 0 \\ x & \text{if } n = 1 \\ 2xT_{n-1}(x) - T_{n-2}(x) & \text{otherwise} \end{cases} \tag{3}$$

$$U_n(x) = \begin{cases} 1 & \text{if } n = 0 \\ 2x & \text{if } n = 1 \\ 2xU_{n-1}(x) - U_{n-2}(x) & \text{otherwise} \end{cases} \tag{4}$$

Write a function *my_chebyshev_poly1(n,x)*, where the output *y* is the n-th Chebyshev polynomial of the first kind evaluated at *x*. Be sure your function can take list inputs for *x*. You may assume that *x* is a list. The output variable, *y*, must be a list also.

Assignment

- What to submit:
- Take a screenshot that covers your code and the output from the following

```
def my_chebyshev_poly1(n,x):
    # Write your function code here

    return y
```

```
x = [1, 2, 3, 4, 5]
```

```
# Output: [1, 1, 1, 1, 1]
my_chebyshev_poly1(0,x)
```

```
# Output: [1, 2, 3, 4, 5]
my_chebyshev_poly1(1,x)
```

```
# Output: [1, 26, 99, 244, 485]
my_chebyshev_poly1(3,x)
```