

## COMPUTER PROGRAMMING I

### 2<sup>nd</sup> Homework Assignment

**Due on: November 21, 2022**

In this homework you will write a program to evaluate polynomials. The user's input will be in two parts, the first describing a polynomial, and second giving various values of the variable at which, the polynomial is to be evaluated. Here is an example:

Enter exponents and coefficients: 0 4 1 7.9 3 2.25

Enter x value: 4

The value of the polynomial at 4 is 179.6

Enter x value: -1.3

The value of the polynomial at -1.3 is -11.2132

Enter x value: quit

In the example above, the string "0 4 1 7.9 3 2.25" corresponds to the following polynomial:  $4x^0 + 7.9x^1 + 2.25x^3$ . You will represent the polynomial in a list. Each element of the list a tuple where the first element of the tuple is exponent, and the second element of the tuple is the coefficient: [(0, 4), (1, 7.9), (3, 2.25)].

You will use the following starter code in the homework:

```
def parse_polynomial(polynomial_string):
    components = polynomial_string.split(" ")
    length = len(components)
    if length % 2 == 1:
        return None
    polynomial_list = []
    for i in range(0, length, 2):
        # todo: implement the loop body
    return polynomial_list

def compute_polynomial(p, x_value):
    y_value = 0.0
    for component in p:
        # todo: implement the loop body
    return y_value

def print_polynomial(p):
    for component in p:
        print(f"{component[0]:>12}", end="")
    print()
    for component in p:
        print(f"{component[1]:9.2f} x ", end="")
    print()
```

```

polynomial = None
while polynomial is None:
    user_input = input("Enter exponents and coefficients: ")
    polynomial = parse_polynomial(user_input)
print_polynomial(polynomial)
print(polynomial)
while True:
    user_input = input("Enter x value: ")
    if # TODO: insert a condition to exit the loop :
        break
    x = float(user_input)
    y = # TODO: make a call to the function
    print(f"The value of the polynomial at {x} is {y:12.4f}")

```

#### Sample outputs:

```

Enter exponents and coefficients: 0 4 1 7.9 3 2.25
      0      1      3
    4.00 x   7.90 x   2.25 x
[(0, 4.0), (1, 7.9), (3, 2.25)]
Enter x value: 4
The value of the polynomial at 4.0 is    179.6000
Enter x value: -1.3
The value of the polynomial at -1.3 is   -11.2133
Enter x value: quit
Process finished with exit code 0

```

```

Enter exponents and coefficients: 1 12.48 7 -99.425 9 34 13 -9.2
      1      7      9      13
    12.48 x  -99.42 x  34.00 x  -9.20 x
[(1, 12.48), (7, -99.425), (9, 34.0), (13, -9.2)]
Enter x value: 4
The value of the polynomial at 4.0 is -610117582.0800
Enter x value: 0
The value of the polynomial at 0.0 is      0.0000
Enter x value: -1
The value of the polynomial at -1.0 is    62.1450
Enter x value: quit

```

**IMPORTANT**

- Academic dishonesty, including but not limited to cheating, plagiarism, and collaboration, is unacceptable and subject to disciplinary action. Any student found guilty will have a grade of F. Assignments are due in class on the due date. Late assignments will generally not be accepted. Any exception must be approved. Approved late assignments are subject to a grade penalty.