## Midterm2

## Tartalomjegyzék

- 1 Programming Problems:
- 1.1 Problem 1 (2 points)
- 1.2

Problem 2
(3 points)

- 1.3

Problem 3
(5 points)

- 1.4

Problem 4
(6 points)

## Programming Problems:

## Problem 1 (2 points)

Write a variadic function, which can have an arbitrary number of keyword arguments (**kwargs). The inputs are names and the age of the persons. Return the names of the persons whose age is above 50.

## Problem 2 (3 points)

Write a variadic function, whose inputs are real numbers, and the function returns whether the given numbers form an arithmetic or geometric sequence or both or none of them.

## Problem 3 (5 points)

Write a Polynomial class, whose input is a dictionary. In the dictionary the keys are the degrees, and the values are the corresponding coefficients.

```
a. Write the __init__ method. (0.5 point)
b. Write the __str__ method, which can print a polynomial in an aesthetic form. (1.5 point)
```

1. Remark: Be careful not to print the parts with zero coefficients, and if the coefficient is 1 or -1 then only show it with $\mathrm{a}+$ or - sign before that part.
2. Remark: We can assume that the keys (degrees) in the dictionary are given in a monotone decreasing order.
```
c. Write an __add__ method for the Polynomial class. It might be useful to write a degree() methoc
```

Example:

```
Let p = Polynomial({24:1, 12:-1, 2:0, 1:0, 0:2}).
Then print(p) returns the following:
x^24 - x^12 + 2
```


## Midterm2

## Problem 4 (6 points)

Write an iterable Primes class, which input is an n natural number, which is the upper bound of the primes.
a. Write the $\qquad$ init method. You should also test whether the input $n$ is a natural number. If it
b. Write the $\qquad$ next and $\qquad$ iter_ $\qquad$ methods. (Make the instances of the Primes class iterable, you c. Write the Mersenne_primes child class of the Primes class, which has a power() method which ret

