

Challenge 1

Write a program to solve a classic puzzle: There are 35 heads and 94 legs among the chickens and rabbits in a farm. How many rabbits and how many chickens do we have? Hint: Use `for` loop to iterate all possible solutions.

Challenge 2

Write a program to track the growing amount of investment over time. An initial deposit, called the principal amount, is made. Each year, the amount increased by a fixed percentage, called the annual rate of the return. For example, a principal amount of RM100 with an annual rate of return of 5% increases the first year by RM5. The second year, the increase is 5% of the new amount RM105, which is RM5.25, and the new amount becomes RM110.25. The program prompts the user to enter an initial amount, an annual rate (percentage) of return, and a number of years. It then prints out the amount of investment, rounded to 2 decimal places at the end of each year for the specified number of years. A sample output from the program is shown below:

```
Initial investment: RM100, annual rate: 5%, investment years: 4
```

```
Year 1: RM105.00
```

```
Year 2: RM110.25
```

```
Year 3: RM115.76
```

```
Year 4: RM121.55
```

Challenge 3

Write a program to print the list after removing numbers which are divisible by 5 or 7 from the numbers ranging from 1 to 100. Hint: Use Python's set.

Challenge 4

In this challenge, the task is to read a set of temperature data (the monthly high temperatures in degree Celsius at Heathrow Airport for 1948 through 2016) from a file and then find some basic information: the highest and lowest temperatures, the mean (average) temperature, and the median temperature (the temperature in the middle if all the temperatures are sorted).

The temperature data is in the file "data/Heathrow.txt". Implement a function named `mean()` to calculate the average temperature and another function named `median()` to calculate the median temperature.

Hints: Use the built-in `len()`, `min()`, `max()`, `sum()`, `sorted()` functions.

Challenge 5

Define a class named `Circle` which can be constructed by a radius. The `Circle` class has two methods which can compute the area and circumference. Create a `Circle` object with a radius of 4 using this class and compute its area and circumference.

Challenge 6

Write a program that reads 'alice.txt', remove punctuations and number from the words, and converts them to lowercase.

- i. Count the total number of unique words in the text file, and the number of times each word is used (word frequency).
- ii. Print the 10 most frequently used words in the text file.
- iii. Determine how many times the word 'alice' appears in the text file.

Hints: Use `isalpha()` and `lower()` methods for string object, and `Counter()` class from the `collections` module for word frequency.