Q. Develop a MapReduce program to calculate the frequency of a given word in a given file.

Wordcount.py

```
import re
from multiprocessing import Pool

WORD_RE = re.compile(r"[\w']+")

def read_file(filename):
    with open(filename, 'r') as file:
        return file.readlines()

def mapper(line):
    word_count = {}
    for word in WORD_RE.findall(line):
        word_count[word.lower()] = word_count.get(word.lower(), 0) + 1
    return word_count

def reducer(mapped_counts):
    reduced_counts = {}
    for word_count in mapped_counts:
        for word, count in word_count.items():
            reduced_counts[word] = reduced_counts.get(word, 0) + count
    print(reduced_counts)
    return reduced_counts

def main(filename, target_word):
    lines = read_file(filename)
    with Pool() as pool:
        mapped_counts = pool.map(mapper, lines)
    reduced_counts = reducer(mapped_counts)

    # Get the frequency of the target word
    target_frequency = reduced_counts.get(target_word.lower(), 0)
```

```
    print(f"The frequency of '{target_word}' in the file is: {target_frequency}")


if __name__ == "__main__":
    filename = input("Enter the file name: ")
    target_word = input("Enter the word to find frequency: ")
    main(filename, target_word)
```

samplefile.txt

The quick brown fox jumps over the lazy dog. The lazy dog yawns and stretches. The fox looks back and smiles at the dog. Then, the fox continues its journey through the forest. The quick brown fox is a clever animal. It knows how to survive in the wild. The lazy dog, on the other hand, prefers to relax and enjoy life. Life is simple for the lazy dog. The quick brown fox and the lazy dog are good friends. They often play together in the meadow. Sometimes, they chase each other around the trees. Other times, they simply lie down and bask in the sun. But no matter what they do, they always have fun together.

Output:

```
PS D:\Learning only> & C:/ProgramData/Python310/python.exe "d:/Learning only/CL4/practical2.py"
Enter the file name: CL4\practical2.txt
Enter the word to find frequency: the
{'the': 17, 'quick': 3, 'brown': 3, 'fox': 5, 'jumps': 1, 'over': 1, 'lazy': 5, 'dog': 6, 'yawns': 1, 'and': 5, 'stretches': 1, 'looks': 1, 'back': 1, 'smile
s': 1, 'at': 1, 'then': 1, 'continues': 1, 'its': 1, 'journey': 1, 'through': 1, 'forest': 1, 'is': 2, 'a': 1, 'clever': 1, 'animal': 1, 'it': 1, 'knows': 1,
 'how': 1, 'to': 2, 'survive': 1, 'in': 3, 'wild': 1, 'on': 1, 'other': 3, 'hand': 1, 'prefers': 1, 'relax': 1, 'enjoy': 1, 'life': 2, 'simple': 1, 'for': 1,
 'are': 1, 'good': 1, 'friends': 1, 'they': 5, 'often': 1, 'play': 1, 'together': 2, 'meadow': 1, 'sometimes': 1, 'chase': 1, 'each': 1, 'around': 1, 'trees'
: 1, 'times': 1, 'simply': 1, 'lie': 1, 'down': 1, 'bask': 1, 'sun': 1, 'but': 1, 'no': 1, 'matter': 1, 'what': 1, 'do': 1, 'always': 1, 'have': 1, 'fun': 1}
The frequency of 'the' in the file is: 17
```