INSTITUTO TECNOLÓGICO Y DE ESTUDIOS SUPERIORES DE MONTERREY

Campus Guadalajara

Maestría en Ciencias de la Computación

Lab 1

Análisis, diseño y construcción de software TC4002.1

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Programming exercise 1

```
import random
value = random.randint(1,30)
print("Guess the value between 1 and 30")
numGuess = 0
cont = True
while cont:
    guess = input()
    numGuess +=1
    if guess == "exit":
        cont = False
    elif value == int(guess):
        print("Your guess is correct")
        cont = False
    elif value < int(guess):
        print("Your guess is too high")
        print("Guess again")
    elif value > int(guess):
        print("Your guess is too low")
        print("Guess again")
f = open("GuessingSteps.txt", "w+")
f.write("Number of guesses were %d\n" % numGuess)
f.close
print("Number of guesses were %d" % numGuess)
```

First run:

```
Guess the value between 1 and 30
15
Your guess is too low
Guess again
27
Your guess is too high
Guess again
20
Your guess is too high
Guess again
17
Your guess is too high
Guess again
16
Your guess is correct
Number of guesses were 5
```

GuessingSteps.txt

```
1   Number of guesses were 5
2
```

Second run:

```
Guess the value between 1 and 30
15
Your guess is too low
Guess again
25
Your guess is too high
Guess again
20
Your guess is too high
Guess again
17
Your guess is correct
Number of guesses were 4
```

GuessingSteps.txt

```
1   Number of guesses were 4
2
```

Third run:

```
Guess the value between 1 and 30
15
Your guess is too low
Guess again
20
Your guess is too low
Guess again
25
Your guess is too high
Guess again
23
Your guess is too high
Guess again
22
Your guess is correct
Number of guesses were 5
```

GuessingSteps.txt

```
1   Number of guesses were 5
2
```

Programming exercise 2

```
def convert2b(test):
    if test == 0:
        bNumber = '0'
    else:
        bNumber = ''
    while test != 0:
        if test % 2:
            bNumber = "1" + bNumber
        else:
            bNumber = "0" + bNumber
        test = int(test/2)
    return bNumber
def convert2x(test):
    if test == 0:
        xNumber = '0'
    else:
        xNumber = ''
    while test != 0:
        xDigit = test % 16
        if xDigit < 10:
            xNumber = str(xDigit) + xNumber
        else:
            xNumber = str(chr(55+xDigit)) + xNumber

        test = int(test/16)
    return xNumber
try:
    print("Please enter a positive number: ")
    entry = input()
    dNumber = int(entry)

    # Decimal to binary
    bNumber = convert2b(dNumber)
    #Decimal to hexadecimal
    xNumber = convert2x(dNumber)

    print(f'binary of {dNumber} is 0b{bNumber} and hexadecimal is 0x{xNumber}')
except ValueError:
    print(f"The input {entry} is not a number")
    exit
```

Test cases:

Input: 0
Input: 15
Input: 16

Input: a
Input: 31
Input: 255
Input: 1234a
Input: 7.5
Input: 25/45
Input: 60000

Print-screen of the previous test cases:

```
C:\Users\pepea\projects\Python\ADCS\Lab1>C:/Users/pepea/AppData/Local/Programs/Python/Python39/python.exe c:/Users/pepea/projec
ts/Python/ADCS/Lab1/convert2X.py
Please enter a positive number:
0
binary of 0 is 0b0 and hexadecimal is 0x0

C:\Users\pepea\projects\Python\ADCS\Lab1>15
"15" no se reconoce como un comando interno o externo,
programa o archivo por lotes ejecutable.

C:\Users\pepea\projects\Python\ADCS\Lab1>C:/Users/pepea/AppData/Local/Programs/Python/Python39/python.exe c:/Users/pepea/projec
ts/Python/ADCS/Lab1/convert2X.py
Please enter a positive number:
15
binary of 15 is 0b1111 and hexadecimal is 0xF

C:\Users\pepea\projects\Python\ADCS\Lab1>C:/Users/pepea/AppData/Local/Programs/Python/Python39/python.exe c:/Users/pepea/projec
ts/Python/ADCS/Lab1/convert2X.py
Please enter a positive number:
16
binary of 16 is 0b10000 and hexadecimal is 0x10

C:\Users\pepea\projects\Python\ADCS\Lab1>C:/Users/pepea/AppData/Local/Programs/Python/Python39/python.exe c:/Users/pepea/projec
ts/Python/ADCS/Lab1/convert2X.py
Please enter a positive number:
a
The input a is not a number

C:\Users\pepea\projects\Python\ADCS\Lab1>C:/Users/pepea/AppData/Local/Programs/Python/Python39/python.exe c:/Users/pepea/projec
ts/Python/ADCS/Lab1/convert2X.py
Please enter a positive number:
32
binary of 32 is 0b100000 and hexadecimal is 0x20

C:\Users\pepea\projects\Python\ADCS\Lab1>C:/Users/pepea/AppData/Local/Programs/Python/Python39/python.exe c:/Users/pepea/projec
ts/Python/ADCS/Lab1/convert2X.py
Please enter a positive number:
31
binary of 31 is 0b11111 and hexadecimal is 0x1F

C:\Users\pepea\projects\Python\ADCS\Lab1>C:/Users/pepea/AppData/Local/Programs/Python/Python39/python.exe c:/Users/pepea/projec
ts/Python/ADCS/Lab1/convert2X.py
Please enter a positive number:
255
binary of 255 is 0b11111111 and hexadecimal is 0xFF
```

```
C:\Users\pepea\projects\Python\ADCS\Lab1>C:/Users/pepea/AppData/Local/Programs/Python/Python39/python.exe c:/Users/pepea/projec
ts/Python/ADCS/Lab1/convert2X.py
Please enter a positive number:
1234a
The input 1234a is not a number

C:\Users\pepea\projects\Python\ADCS\Lab1>C:/Users/pepea/AppData/Local/Programs/Python/Python39/python.exe c:/Users/pepea/projec
ts/Python/ADCS/Lab1/convert2X.py
Please enter a positive number:
7.5
The input 7.5 is not a number

C:\Users\pepea\projects\Python\ADCS\Lab1>C:/Users/pepea/AppData/Local/Programs/Python/Python39/python.exe c:/Users/pepea/projec
ts/Python/ADCS/Lab1/convert2X.py
Please enter a positive number:
25/45
The input 25/45 is not a number

C:\Users\pepea\projects\Python\ADCS\Lab1>C:/Users/pepea/AppData/Local/Programs/Python/Python39/python.exe c:/Users/pepea/projec
ts/Python/ADCS/Lab1/convert2X.py
Please enter a positive number:
60000
binary of 60000 is 0b1110101001100000 and hexadecimal is 0xEA60
```

Programming exercise 3

```
import sys
if len(sys.argv) < 3:
    print(f"Usage: {sys.argv[0]} filename words to search")
    exit()
try:
    search_words = []
    ocurrence = []
    for x in range(len(sys.argv) - 2):
        search_words.append(sys.argv[x+2])
        ocurrence.append(0)
    file_name = sys.argv[1]
    fd = open(file_name, 'r', 1)
    for line in fd:
        parsed_line = line.rstrip('\n').split(" ")
#         print(parsed_line)
        for word in parsed_line:
            for str in search_words:
#                 print(f"{word} {str}")
                if str == word:
                    ocurrence[search_words.index(str)] = ocurrence[search_words.index(str)] + 1
    fd.close()
    for words in search_words:
        print(f"{words} was found a total of {ocurrence[search_words.index(words)]}")
except IOError:
    print(f"Could not read file: {file_name}")
    exit
```

Testing file:

testingFile.txt

```
1   Hello this is a test
2   For the testing of
3   findWords python Is it working
4   as expected for the Test
```

Test cases:

Input: test for of the
Input: 0
Input al*

Print-screen of the previous cases:

```
C:\Users\pepea\projects\Python\ADCS\Lab1>C:/Users/pepea/AppData/Local/Programs/Python/Python39/python.exe c:/Users/pepea/projec
ts/Python/ADCS/Lab1/findWords.py testingFile.txt test for of the
test was found a total of 1
for was found a total of 1
of was found a total of 1
the was found a total of 2

C:\Users\pepea\projects\Python\ADCS\Lab1>C:/Users/pepea/AppData/Local/Programs/Python/Python39/python.exe c:/Users/pepea/projec
ts/Python/ADCS/Lab1/findWords.py testingFile.txt 0
0 was found a total of 0

C:\Users\pepea\projects\Python\ADCS\Lab1>C:/Users/pepea/AppData/Local/Programs/Python/Python39/python.exe c:/Users/pepea/projec
ts/Python/ADCS/Lab1/findWords.py testingFile.txt al*
al* was found a total of 0
```