

**PRAKTIKUM ALGORITMA DAN
STRUKTUR DATA**

Modul 1

Tinjau Ulang



Disusun oleh:

DONI WAHYU SAPUTRO

L200200169

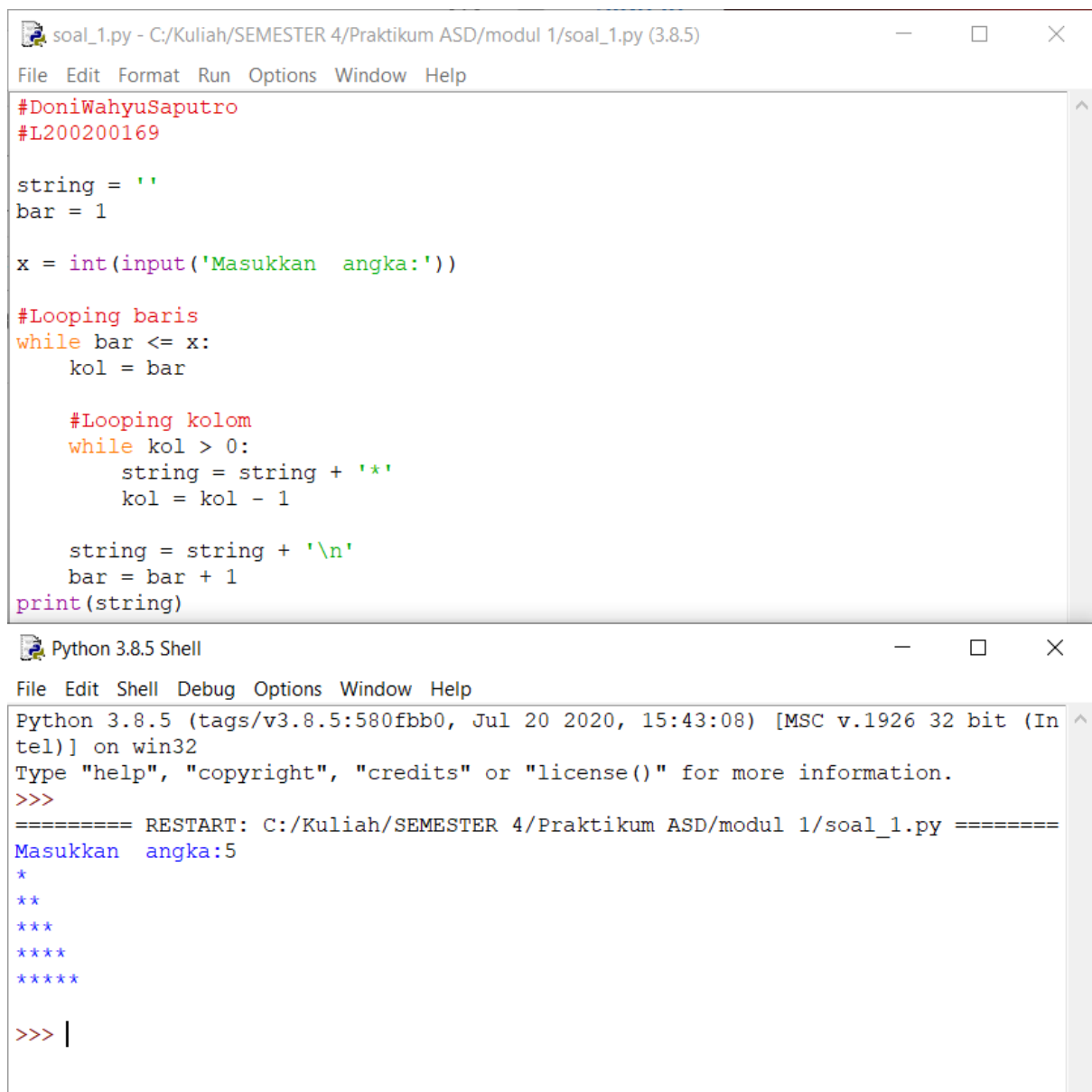
G

PROGRAM STUDI TEKNIK INFORMATIKA

FAKULTAS KOMUNIKASI DAN INFORMATIKA

UNIVERSITAS MUHAMMADIYAH SURAKARTA

Soal 1



The image shows a screenshot of a Python IDE with two windows. The top window, titled 'soal_1.py - C:/Kuliah/SEMESTER 4/Praktikum ASD/modul 1/soal_1.py (3.8.5)', contains the following Python code:

```
#DoniWahyuSaputro
#L200200169

string = ''
bar = 1

x = int(input('Masukkan angka:'))

#Looping baris
while bar <= x:
    kol = bar

    #Looping kolom
    while kol > 0:
        string = string + '*'
        kol = kol - 1

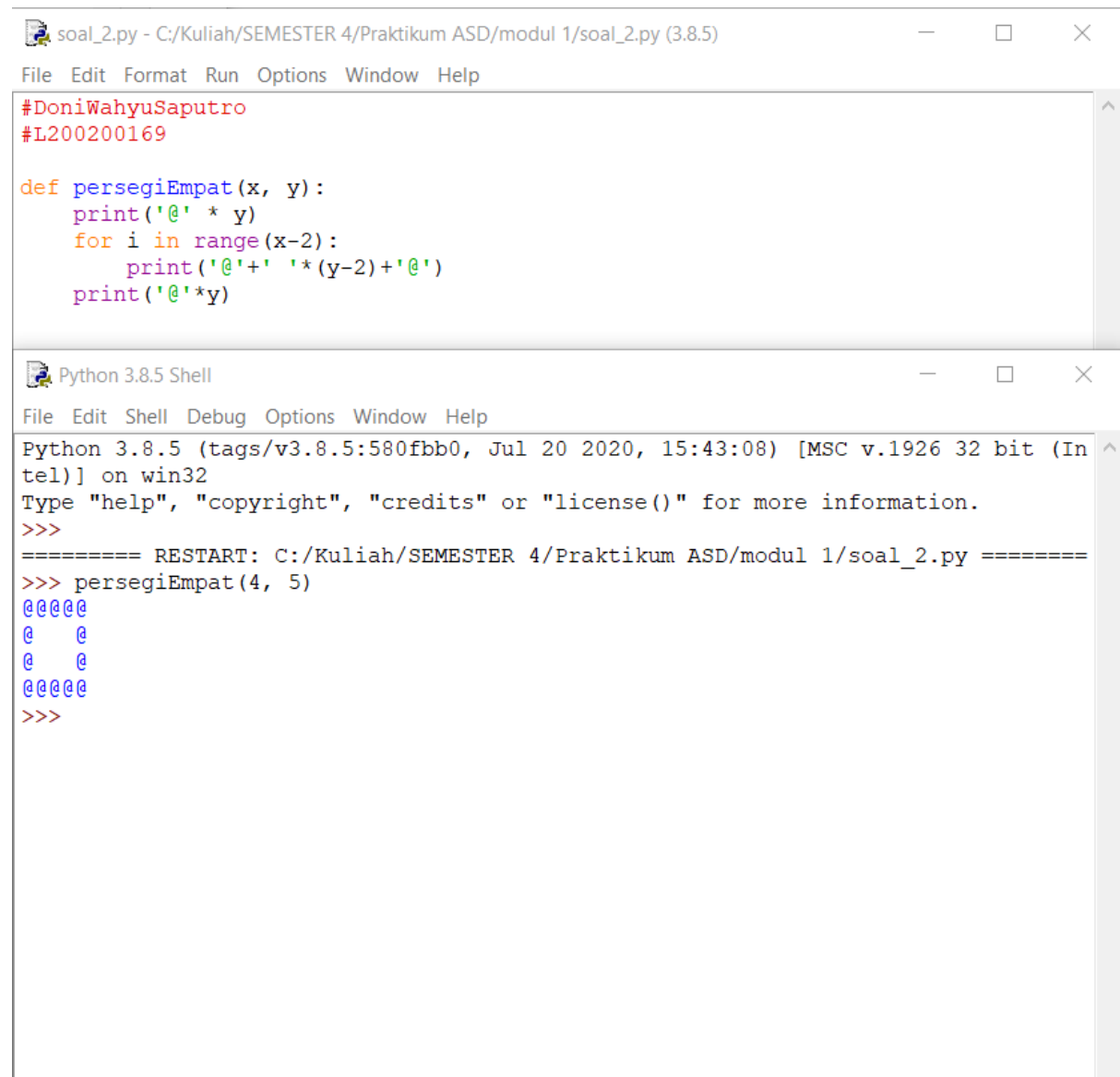
    string = string + '\n'
    bar = bar + 1
print(string)
```

The bottom window, titled 'Python 3.8.5 Shell', shows the execution of the script. It displays the Python version and build information, followed by the program's output for the input '5':

```
Python 3.8.5 (tags/v3.8.5:580fbb0, Jul 20 2020, 15:43:08) [MSC v.1926 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: C:/Kuliah/SEMESTER 4/Praktikum ASD/modul 1/soal_1.py =====
Masukkan angka:5
*
**
***
****
*****

>>> |
```

Soal 2



The image shows a screenshot of a Python IDE with two windows. The top window, titled 'soal_2.py - C:/Kuliah/SEMESTER 4/Praktikum ASD/modul 1/soal_2.py (3.8.5)', contains the following Python code:

```
#DoniWahyuSaputro
#L200200169

def persegiEmpat(x, y):
    print('@' * y)
    for i in range(x-2):
        print('@'+' '*(y-2)+'@')
    print('@'*y)
```

The bottom window, titled 'Python 3.8.5 Shell', shows the execution of the script. The output is as follows:

```
Python 3.8.5 (tags/v3.8.5:580fbb0, Jul 20 2020, 15:43:08) [MSC v.1926 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: C:/Kuliah/SEMESTER 4/Praktikum ASD/modul 1/soal_2.py =====
>>> persegiEmpat(4, 5)
@@@@@
@  @
@  @
@@@@@
>>>
```

Soal 3

```
soal_3.py - C:\Kuliah\SEMESTER 4\Praktikum ASD\modul 1\soal_3.py (3.8.5)
File Edit Format Run Options Window Help

#DoniWahyuSaputro
#L200200169
def jumlahHurufVokal(kata):
    vokal = ['a', 'i', 'u', 'e', 'o']
    kata2 = kata.lower()
    list_kata = []
    list_kata.append(len(kata2))
    count = 0
    for i in kata2:
        if i in vokal:
            count += 1
    list_kata.append(count)
    return list_kata

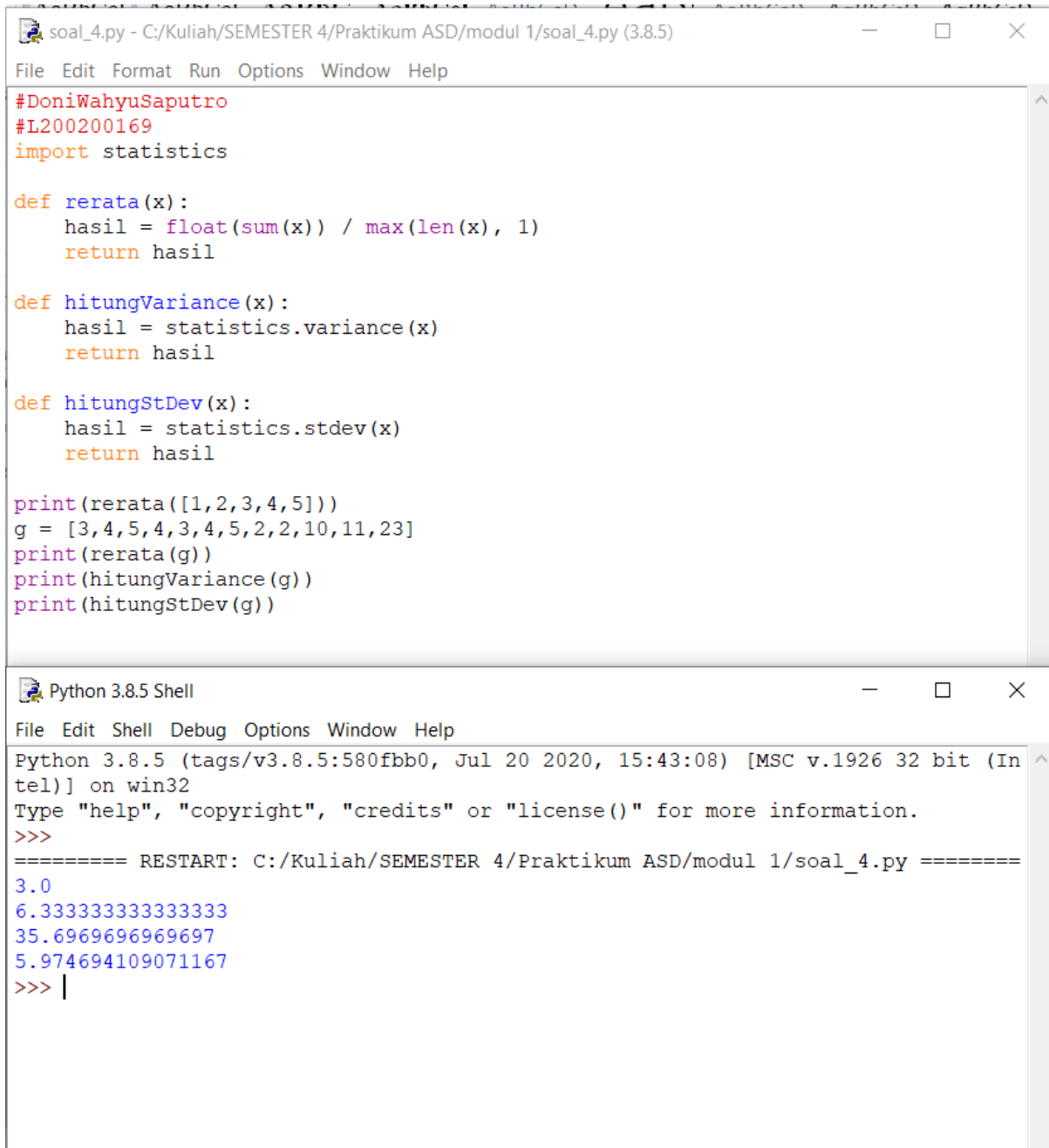
def jumlahHurufKonsonan(kata):
    konsonan = ['b', 'c', 'd', 'f', 'g', 'h', 'j', 'k', 'l', 'm', 'n', 'p', 'q',
    kata2 = kata.lower()
    list_kata = []
    list_kata.append(len(kata2))
    count = 0
    for i in kata2:
        if i in konsonan:
            count += 1
    list_kata.append(count)
    return list_kata

print(jumlahHurufVokal('Surakarta'))
print(jumlahHurufKonsonan('Surakarta'))

Python 3.8.5 Shell
File Edit Shell Debug Options Window Help

Python 3.8.5 (tags/v3.8.5:580fbb0, Jul 20 2020, 15:43:08) [MSC v.1926 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: C:\Kuliah\SEMESTER 4\Praktikum ASD\modul 1\soal_3.py =====
[9, 4]
[9, 1]
>>>
```

Soal 4



The image shows a screenshot of a Python IDE with two windows. The top window, titled 'soal_4.py - C:/Kuliah/SEMESTER 4/Praktikum ASD/modul 1/soal_4.py (3.8.5)', contains the following Python code:

```
#DoniWahyuSaputro
#L200200169
import statistics

def rerata(x):
    hasil = float(sum(x)) / max(len(x), 1)
    return hasil

def hitungVariance(x):
    hasil = statistics.variance(x)
    return hasil

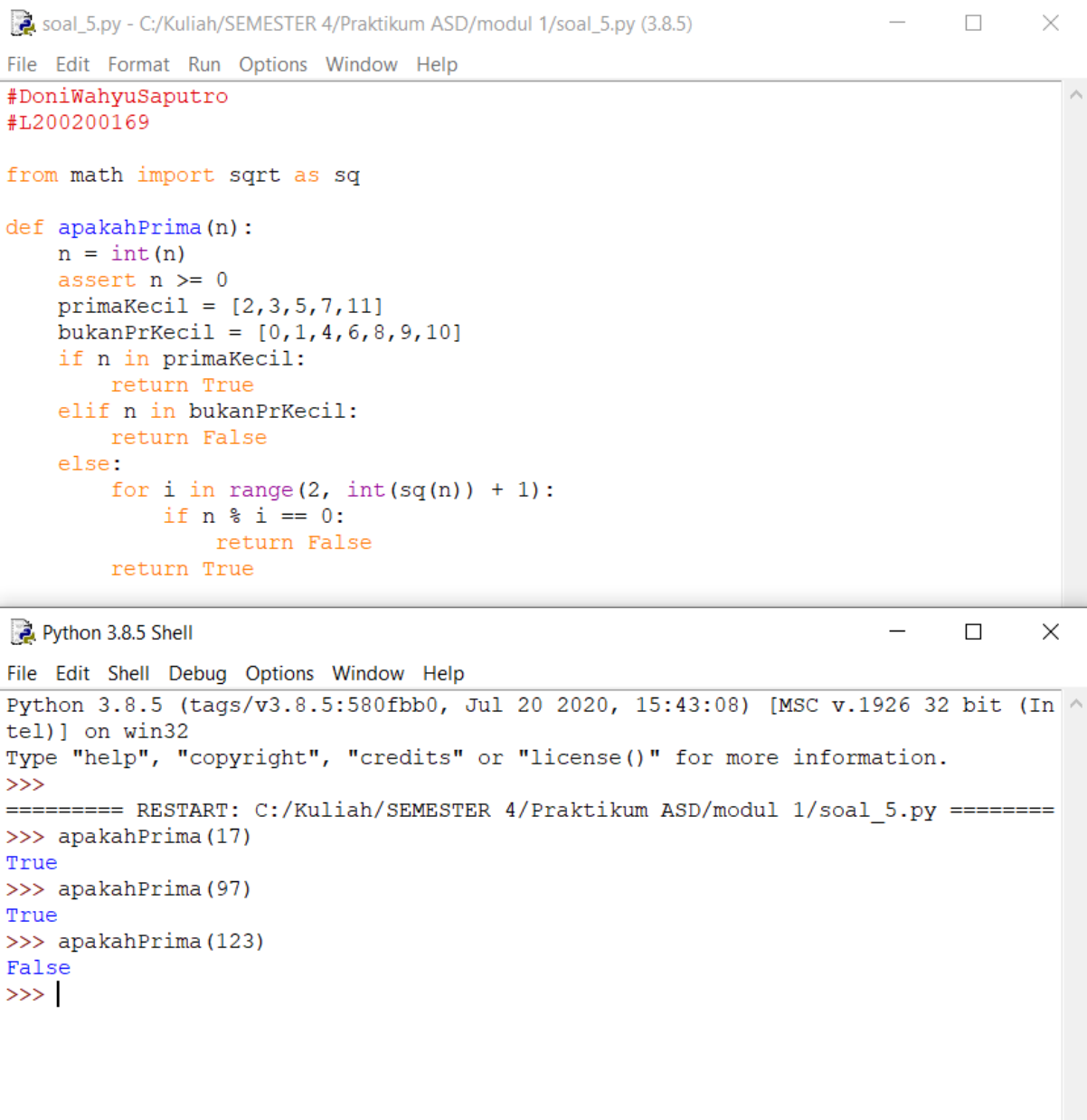
def hitungStDev(x):
    hasil = statistics.stdev(x)
    return hasil

print(rerata([1,2,3,4,5]))
g = [3,4,5,4,3,4,5,2,2,10,11,23]
print(rerata(g))
print(hitungVariance(g))
print(hitungStDev(g))
```

The bottom window, titled 'Python 3.8.5 Shell', shows the execution output:

```
Python 3.8.5 (tags/v3.8.5:580fbb0, Jul 20 2020, 15:43:08) [MSC v.1926 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: C:/Kuliah/SEMESTER 4/Praktikum ASD/modul 1/soal_4.py =====
3.0
6.333333333333333
35.6969696969697
5.974694109071167
>>> |
```

Soal 5



The image shows a screenshot of a Python IDE with two windows. The top window, titled 'soal_5.py - C:/Kuliah/SEMESTER 4/Praktikum ASD/modul 1/soal_5.py (3.8.5)', contains a Python script. The script defines a function 'apakahPrima(n)' that checks if a number is prime. It uses a list 'primaKecil' for small primes and a list 'bukanPrKecil' for non-primes. For larger numbers, it checks divisibility up to the square root of the number. The bottom window, titled 'Python 3.8.5 Shell', shows the execution of the script. It displays the output of the function for three inputs: 17 (True), 97 (True), and 123 (False).

```
#DoniWahyuSaputro
#L200200169

from math import sqrt as sq

def apakahPrima(n):
    n = int(n)
    assert n >= 0
    primaKecil = [2,3,5,7,11]
    bukanPrKecil = [0,1,4,6,8,9,10]
    if n in primaKecil:
        return True
    elif n in bukanPrKecil:
        return False
    else:
        for i in range(2, int(sq(n)) + 1):
            if n % i == 0:
                return False
        return True
```

```
Python 3.8.5 (tags/v3.8.5:580fbb0, Jul 20 2020, 15:43:08) [MSC v.1926 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: C:/Kuliah/SEMESTER 4/Praktikum ASD/modul 1/soal_5.py =====
>>> apakahPrima(17)
True
>>> apakahPrima(97)
True
>>> apakahPrima(123)
False
>>> |
```

Soal 6

soal_6.py - C:/Kuliah/SEMESTER 4/Praktikum ASD/modul 1/soal_6.py (3.8.5)

File Edit Format Run Options Window Help

```
#DoniWahyuSaputro
#L200200169

def is_prima(x):
    for i in range(2, x):
        if x % i == 0:
            return False

    return True

def bilangan_prima (awal, akhir):
    list_bilangan_prima = []

    for x in range(awal, akhir + 1):
        if is_prima(x):
            list_bilangan_prima.append(x)

    return list_bilangan_prima

print(bilangan_prima(2, 1000))
```

Python 3.8.5 Shell

File Edit Shell Debug Options Window Help

Python 3.8.5 (tags/v3.8.5:580fbb0, Jul 20 2020, 15:43:08) [MSC v.1926 32 bit (Intel)] on win32

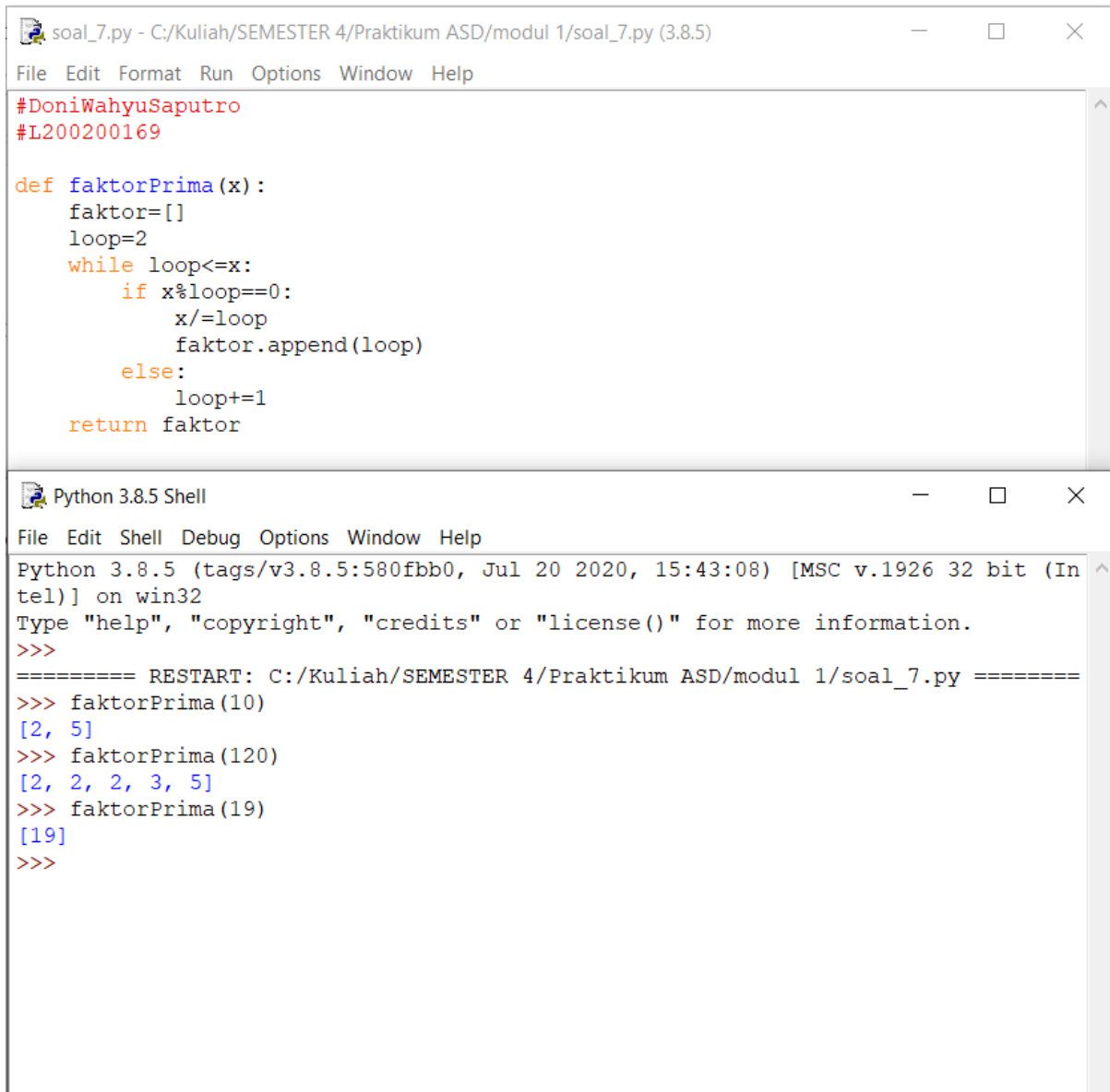
Type "help", "copyright", "credits" or "license()" for more information.

>>>

```
===== RESTART: C:/Kuliah/SEMESTER 4/Praktikum ASD/modul 1/soal_6.py =====
[2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73,
 79, 83, 89, 97, 101, 103, 107, 109, 113, 127, 131, 137, 139, 149, 151, 157, 163
, 167, 173, 179, 181, 191, 193, 197, 199, 211, 223, 227, 229, 233, 239, 241, 251
, 257, 263, 269, 271, 277, 281, 283, 293, 307, 311, 313, 317, 331, 337, 347, 349
, 353, 359, 367, 373, 379, 383, 389, 397, 401, 409, 419, 421, 431, 433, 439, 443
, 449, 457, 461, 463, 467, 479, 487, 491, 499, 503, 509, 521, 523, 541, 547, 557
, 563, 569, 571, 577, 587, 593, 599, 601, 607, 613, 617, 619, 631, 641, 643, 647
, 653, 659, 661, 673, 677, 683, 691, 701, 709, 719, 727, 733, 739, 743, 751, 757
, 761, 769, 773, 787, 797, 809, 811, 821, 823, 827, 829, 839, 853, 857, 859, 863
, 877, 881, 883, 887, 907, 911, 919, 929, 937, 941, 947, 953, 967, 971, 977, 983
, 991, 997]
```

>>>

Soal 7



The image shows a screenshot of a Python IDE with two windows. The top window, titled 'soal_7.py - C:/Kuliah/SEMESTER 4/Praktikum ASD/modul 1/soal_7.py (3.8.5)', contains a Python script. The script starts with a comment identifying the author as Doni Wahyu Saputro with ID L200200169. It defines a function 'faktorPrima(x)' that finds the prime factors of a number 'x'. The function initializes an empty list 'faktor', sets 'loop' to 2, and enters a while loop that continues as long as 'loop' is less than or equal to 'x'. Inside the loop, it checks if 'x' is divisible by 'loop'. If yes, it divides 'x' by 'loop' and appends 'loop' to the 'faktor' list. If no, it increments 'loop' by 1. Finally, it returns the 'faktor' list. The bottom window, titled 'Python 3.8.5 Shell', shows the execution of the script. It displays the Python version and build information, followed by a restart message. Then, it shows three function calls: 'faktorPrima(10)' returning '[2, 5]', 'faktorPrima(120)' returning '[2, 2, 2, 3, 5]', and 'faktorPrima(19)' returning '[19]'. The shell prompt '>>>' is shown at the end of each line.

```
soal_7.py - C:/Kuliah/SEMESTER 4/Praktikum ASD/modul 1/soal_7.py (3.8.5)
File Edit Format Run Options Window Help

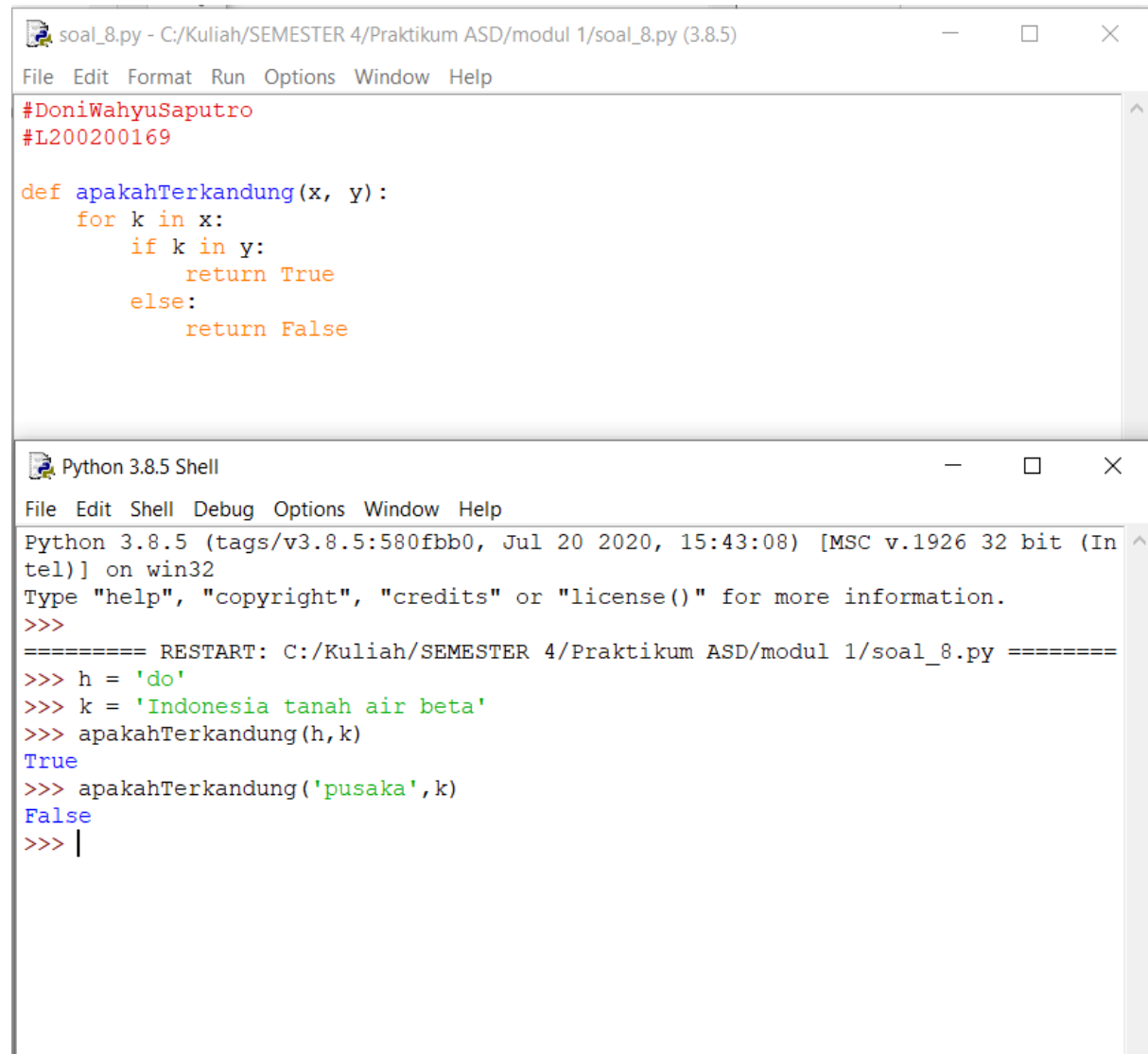
#DoniWahyuSaputro
#L200200169

def faktorPrima(x):
    faktor=[]
    loop=2
    while loop<=x:
        if x%loop==0:
            x/=loop
            faktor.append(loop)
        else:
            loop+=1
    return faktor

Python 3.8.5 Shell
File Edit Shell Debug Options Window Help

Python 3.8.5 (tags/v3.8.5:580fbb0, Jul 20 2020, 15:43:08) [MSC v.1926 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: C:/Kuliah/SEMESTER 4/Praktikum ASD/modul 1/soal_7.py =====
>>> faktorPrima(10)
[2, 5]
>>> faktorPrima(120)
[2, 2, 2, 3, 5]
>>> faktorPrima(19)
[19]
>>>
```


Soal 8



The image shows a screenshot of a Python IDE with two windows. The top window, titled 'soal_8.py - C:/Kuliah/SEMESTER 4/Praktikum ASD/modul 1/soal_8.py (3.8.5)', contains a Python script. The script starts with a comment identifying the author as Doni Wahyu Saputro with ID L200200169. It then defines a function named 'apakahTerkandung' which takes two arguments, 'x' and 'y'. The function uses a 'for' loop to iterate over each character 'k' in 'x'. For each character, it checks if 'k' is in 'y'. If it is, the function returns 'True'. If the loop completes without finding any characters in 'y', it returns 'False'.

```
#DoniWahyuSaputro
#L200200169

def apakahTerkandung(x, y):
    for k in x:
        if k in y:
            return True
        else:
            return False
```

The bottom window, titled 'Python 3.8.5 Shell', shows the execution of the script. It displays the Python version and build information, followed by a prompt to type 'help', 'copyright', 'credits', or 'license()'. After a restart, the shell shows the execution of the script's test cases. The first test case sets 'h' to 'do' and 'k' to 'Indonesia tanah air beta', and the function returns 'True'. The second test case sets 'h' to 'pusaka' and 'k' to 'Indonesia tanah air beta', and the function returns 'False'.

```
Python 3.8.5 (tags/v3.8.5:580fbb0, Jul 20 2020, 15:43:08) [MSC v.1926 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: C:/Kuliah/SEMESTER 4/Praktikum ASD/modul 1/soal_8.py =====
>>> h = 'do'
>>> k = 'Indonesia tanah air beta'
>>> apakahTerkandung(h,k)
True
>>> apakahTerkandung('pusaka',k)
False
>>> |
```

Soal 9

soal_9.py - C:/Kuliah/SEMESTER 4/Praktikum ASD/modul 1/soal_9.py (3.8.5)

File Edit Format Run Options Window Help

```
#DoniWahyuSaputro  
#L200200169
```

```
for i in range(1, 100):  
    if (i % 3 == 0 and i % 5 == 0):  
        print ('Python UMS')  
    elif i % 3 == 0:  
        print ('Python')  
    elif i % 5 == 0:  
        print ('UMS')  
    else:  
        print(i)
```

Python 3.8.5 Shell

File Edit Shell Debug Options Window Help

Python 3.8.5 (tags/v3.8.5:580fbb0, Jul 20 2020, 15:43:08) [MSC v.1926 32 bit (Intel)] on win32

Type "help", "copyright", "credits" or "license()" for more information.

>>>

===== RESTART: C:/Kuliah/SEMESTER 4/Praktikum ASD/modul 1/soal_9.py =====

1

2

Python

4

UMS

Python

7

8

Python

UMS

11

Python

13

14

Python UMS

16

17

Python

19

UMS

Python

22

23

Python

UMS

26

Soal 10

soal_10.py - C:/Kuliah/SEMESTER 4/Praktikum ASD/modul 1/soal_10.py (3.8.5)

File Edit Format Run Options Window Help

```
#DoniWahyuSaputro
#L200200169

def selesaikanABC(a, b, c):
    a=float(a)
    b=float(b)
    c=float(c)
    D=(b**2) - (4*a*c)
    if D<0:
        return 'Determinanya negatif. Persamaan tidak mempunyai akar real'
    else:
        x1=(-b + sq(D))/2*a
        x2=(-b - sq(D))/2*a
        hasil=(x1, x2)
        return hasil
```

Python 3.8.5 Shell

File Edit Shell Debug Options Window Help

Python 3.8.5 (tags/v3.8.5:580fbb0, Jul 20 2020, 15:43:08) [MSC v.1926 32 bit (Intel)] on win32

Type "help", "copyright", "credits" or "license()" for more information.

>>>

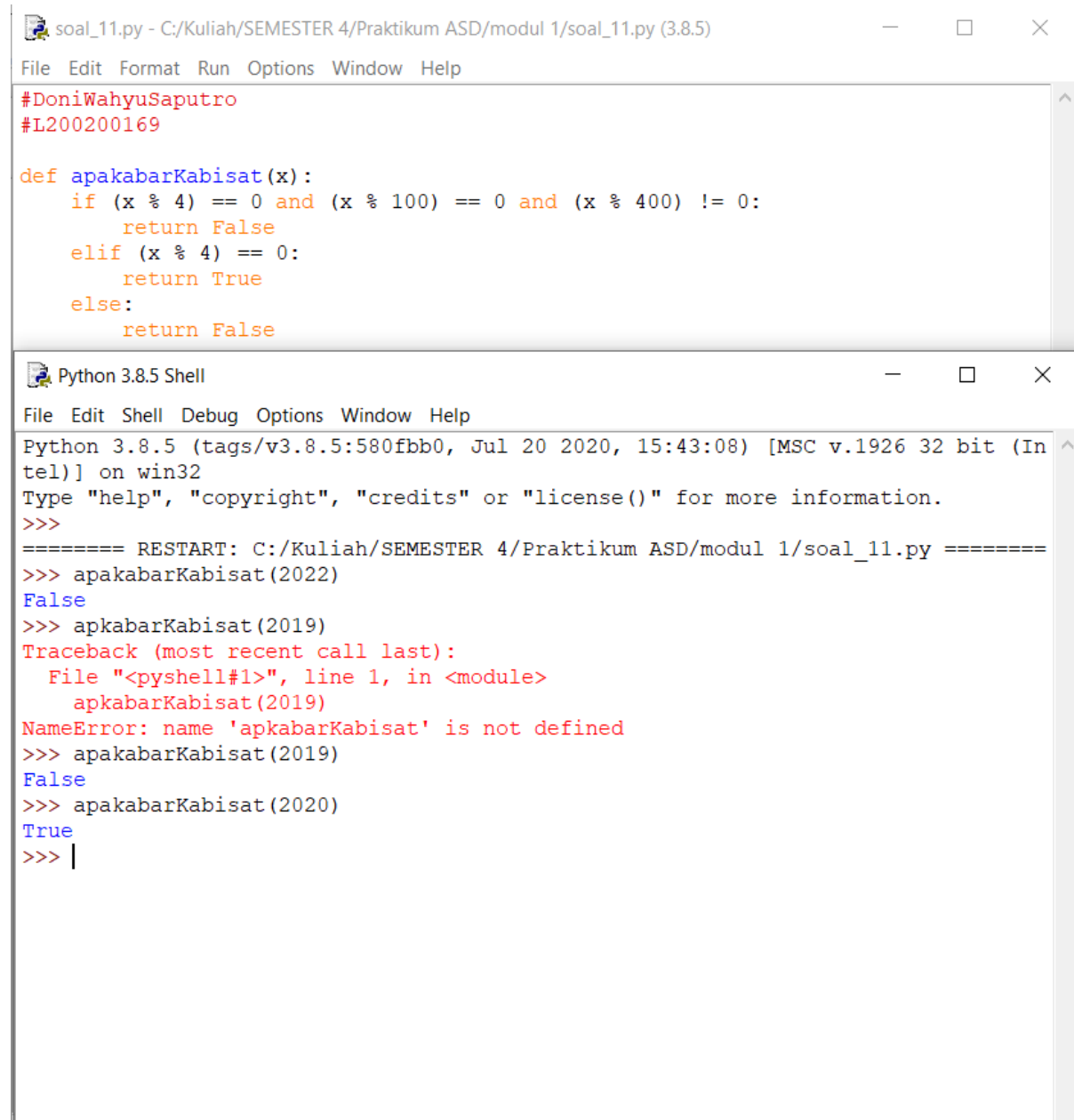
===== RESTART: C:/Kuliah/SEMESTER 4/Praktikum ASD/modul 1/soal_10.py =====

>>> selesaikanABC(1, 2, 3)

'Determinanya negatif. Persamaan tidak mempunyai akar real'

>>> |

Soal 11



The image shows a screenshot of a Python IDE with two windows. The top window, titled 'soal_11.py - C:/Kuliah/SEMESTER 4/Praktikum ASD/modul 1/soal_11.py (3.8.5)', contains a Python script. The script defines a function 'apakabarKabisat(x)' that checks if a year is a leap year. The bottom window, titled 'Python 3.8.5 Shell', shows the execution of the script. It displays the output of the function for the years 2022, 2019, and 2020, and shows a 'NameError' for the year 2019 when the function is called with a different name.

```
soal_11.py - C:/Kuliah/SEMESTER 4/Praktikum ASD/modul 1/soal_11.py (3.8.5)
File Edit Format Run Options Window Help

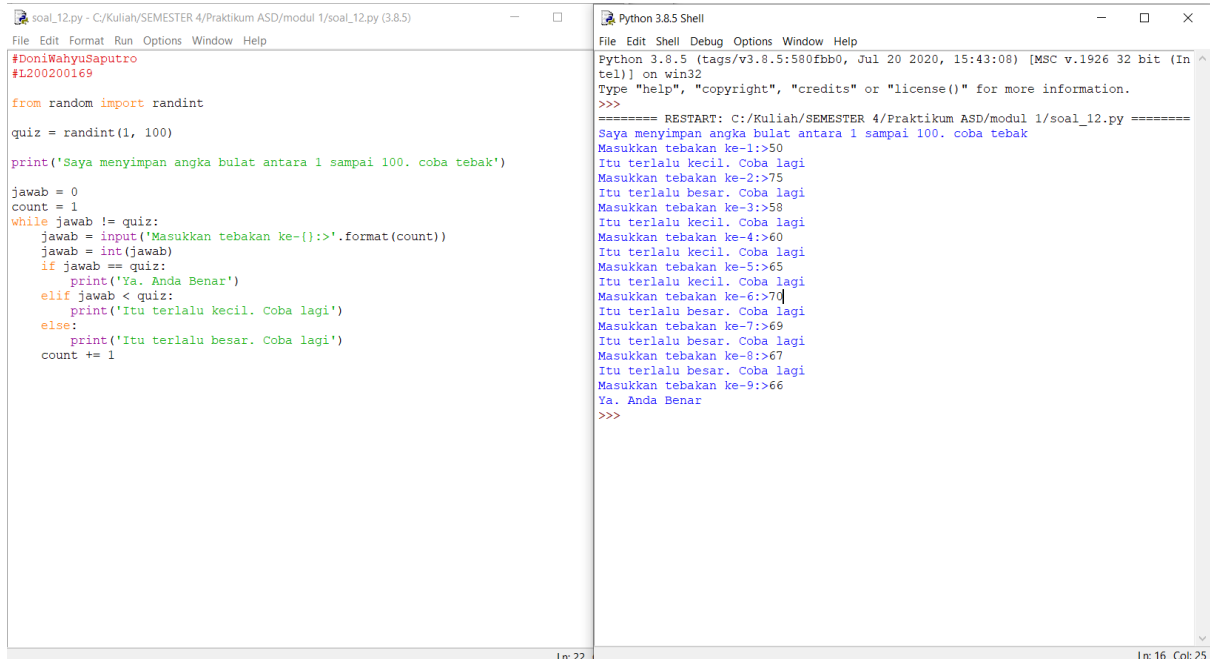
#DoniWahyuSaputro
#L200200169

def apakabarKabisat(x):
    if (x % 4) == 0 and (x % 100) == 0 and (x % 400) != 0:
        return False
    elif (x % 4) == 0:
        return True
    else:
        return False

Python 3.8.5 Shell
File Edit Shell Debug Options Window Help

Python 3.8.5 (tags/v3.8.5:580fbb0, Jul 20 2020, 15:43:08) [MSC v.1926 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: C:/Kuliah/SEMESTER 4/Praktikum ASD/modul 1/soal_11.py =====
>>> apakabarKabisat(2022)
False
>>> apkabarKabisat(2019)
Traceback (most recent call last):
  File "<pyshell#1>", line 1, in <module>
    apkabarKabisat(2019)
NameError: name 'apkabarKabisat' is not defined
>>> apakabarKabisat(2019)
False
>>> apakabarKabisat(2020)
True
>>> |
```

Soal 12



```
soal_12.py - C:/Kuliah/SEMESTER 4/Praktikum ASD/modul 1/soal_12.py (3.8.5)
File Edit Format Run Options Window Help

#DoniWahyuSaputro
#L200200169

from random import randint

quiz = randint(1, 100)

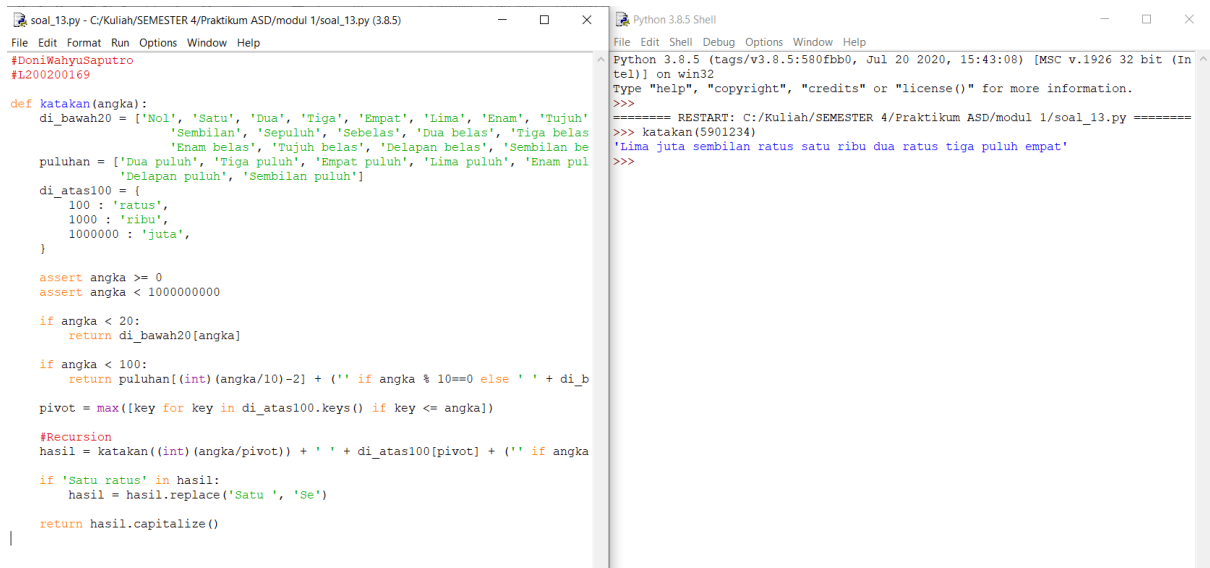
print('Saya menyimpan angka bulat antara 1 sampai 100. coba tebak')

jawab = 0
count = 1
while jawab != quiz:
    jawab = input('Masukkan tebakan ke-{}:>'.format(count))
    jawab = int(jawab)
    if jawab == quiz:
        print('Ya. Anda Benar')
    elif jawab < quiz:
        print('Itu terlalu kecil. Coba lagi')
    else:
        print('Itu terlalu besar. Coba lagi')
    count += 1

Python 3.8.5 Shell
File Edit Shell Debug Options Window Help

Python 3.8.5 (tags/v3.8.5:580fbb0, Jul 20 2020, 15:43:08) [MSC v.1926 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: C:/Kuliah/SEMESTER 4/Praktikum ASD/modul 1/soal_12.py =====
Saya menyimpan angka bulat antara 1 sampai 100. coba tebak
Masukkan tebakan ke-1:>50
Itu terlalu kecil. Coba lagi
Masukkan tebakan ke-2:>75
Itu terlalu besar. Coba lagi
Masukkan tebakan ke-3:>58
Itu terlalu kecil. Coba lagi
Masukkan tebakan ke-4:>60
Itu terlalu kecil. Coba lagi
Masukkan tebakan ke-5:>65
Itu terlalu kecil. Coba lagi
Masukkan tebakan ke-6:>70
Itu terlalu besar. Coba lagi
Masukkan tebakan ke-7:>69
Itu terlalu besar. Coba lagi
Masukkan tebakan ke-8:>67
Itu terlalu besar. Coba lagi
Masukkan tebakan ke-9:>66
Ya. Anda Benar
>>>
```

Soal 13



```
soal_13.py - C:/Kuliah/SEMESTER 4/Praktikum ASD/modul 1/soal_13.py (3.8.5)
File Edit Format Run Options Window Help

#DoniWahyuSaputro
#L200200169

def katakan(angka):
    di_bawah20 = ['Nol', 'Satu', 'Dua', 'Tiga', 'Empat', 'Lima', 'Enam', 'Tujuh',
                  'Sembilan', 'Sepuluh', 'Sebelas', 'Dua belas', 'Tiga belas',
                  'Enam belas', 'Tujuh belas', 'Delapan belas', 'Sembilan belas']
    puluhan = ['Dua puluh', 'Tiga puluh', 'Empat puluh', 'Lima puluh', 'Enam puluh',
               'Delapan puluh', 'Sembilan puluh']
    di_atas100 = {
        100 : 'ratus',
        1000 : 'ribu',
        1000000 : 'juta',
    }

    assert angka >= 0
    assert angka < 10000000000

    if angka < 20:
        return di_bawah20[angka]

    if angka < 100:
        return puluhan[(int)(angka/10)-2] + (' if angka % 10==0 else ' ' + di_bawah20[angka%10])

    pivot = max([key for key in di_atas100.keys() if key <= angka])

    #Recursion
    hasil = katakan((int)(angka/pivot)) + ' ' + di_atas100[pivot] + (' if angka % pivot==0 else ' ')

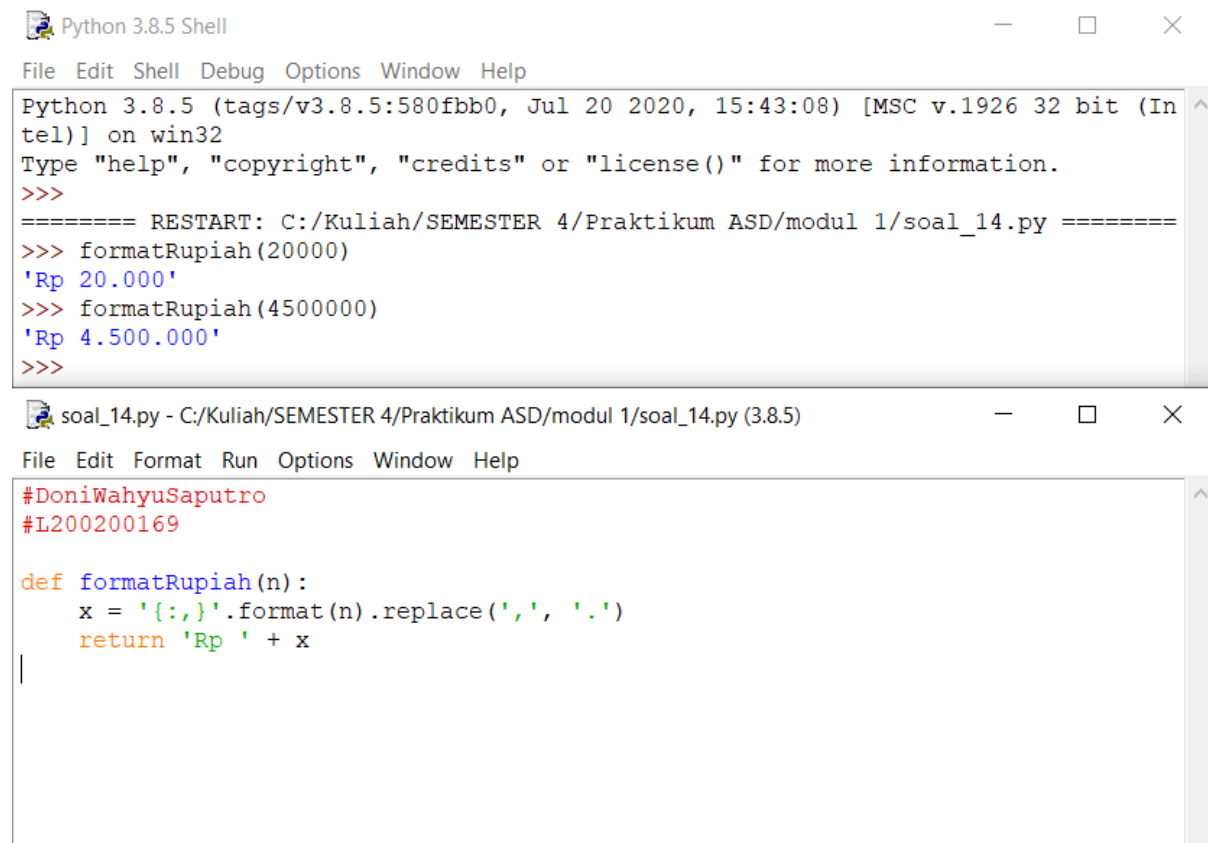
    if 'Satu ratus' in hasil:
        hasil = hasil.replace('Satu ', 'Se')

    return hasil.capitalize()

Python 3.8.5 Shell
File Edit Shell Debug Options Window Help

Python 3.8.5 (tags/v3.8.5:580fbb0, Jul 20 2020, 15:43:08) [MSC v.1926 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: C:/Kuliah/SEMESTER 4/Praktikum ASD/modul 1/soal_13.py =====
>>> katakan(5901234)
'Lima juta sembilan ratus satu ribu dua ratus tiga puluh empat'
>>>
```

Soal 14



```
Python 3.8.5 Shell
File Edit Shell Debug Options Window Help
Python 3.8.5 (tags/v3.8.5:580fbb0, Jul 20 2020, 15:43:08) [MSC v.1926 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: C:/Kuliah/SEMESTER 4/Praktikum ASD/modul 1/soal_14.py =====
>>> formatRupiah(20000)
'Rp 20.000'
>>> formatRupiah(4500000)
'Rp 4.500.000'
>>>

soal_14.py - C:/Kuliah/SEMESTER 4/Praktikum ASD/modul 1/soal_14.py (3.8.5)
File Edit Format Run Options Window Help
#DoniWahyuSaputro
#L200200169

def formatRupiah(n):
    x = '{:,}'.format(n).replace(',', '.')
    return 'Rp ' + x
|
```