

Homework 1

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Problem 1

The screenshot shows the Spyder Python IDE interface. The left pane displays a Python script (pl.py) that calculates an employee's weekly salary. The script includes comments explaining the logic: it takes hours worked and salary rate as input, calculates overtime pay at 1.5 times the hourly rate for hours exceeding 40, and adds a bonus if the worker received one. The right pane shows the Python console with the script's output, including prompts for user input and the final calculated salary.

```
1 # -*- coding: utf-8 -*-
2 """
3 Spyder Editor
4 This is a temporary script file.
5 """
6
7
8 print("This program determines the weekly salary for an employee.",
9       "\nThe salary is the sum of the hourly rate times the",
10      "hours worked, plus the bonus.",
11      "\nFor work hours exceeding 40 per week, an overtime rate",
12      "of 1.5 is applied.",
13      "\nThe user must indicate if the worker has received a",
14      "bonus by answering a y/n question.",
15      "\nInput consists of: hours worked, hourly rate, bonus.",
16      "\nThe output is the total salary for this week.")
17
18 hours_str = input("Enter the number of hours worked this week: ")
19 hours_float = int(hours_str)
20 salary_str = input("Enter the salary rate per hour (do not include the '$' sign):")
21 salary_float = int(salary_str)
22
23
24 if hours_float > 40:
25     hours_ot_float = hours_float - 40
26     overtime = (hours_ot_float * (salary_float *1.5))
27     total = overtime + (40 * salary_float)
28 else:
29     total = hours_float * salary_float
30     overtime = 0.00
31
32 bonus_bool = input("Did the worker get a bonus ? (y/n): ")
33
34 if bonus_bool.lower() == 'y':
35     bonus_str = input("Enter bonus: ")
36     bonus_float = float(bonus_str)
37     total = total + bonus_float
38
39 print("The total salary is $", total, " (overtime pay is $", overtime, ")")
40
```

Python console output:

```
Python 3.6.4 [Anaconda, Inc.] (default, Jan 16 2018, 18:22:32) [MSC v.1900 64 bit (AMD64)]
Type "copyright", "credits" or "license()" for more information.

Python 6.2.1 -- An enhanced Interactive Python.

In [1]: runfile('E:/FAU/COP4845 - Python/M4/pl.py', wdir='E:/FAU/COP4845 - Python/M4/M41')
This program determines the weekly salary for an employee.
The salary is the sum of the hourly rate times the hours worked, plus the bonus.
For work hours exceeding 40 per week, an overtime rate of 1.5 is applied.
The user must indicate if the worker has received a bonus by answering a y/n question.
Input consists of: hours worked, hourly rate, bonus.
The output is the total salary for this week.

Enter the number of hours worked this week: 45

Enter the salary rate per hour (do not include the '$' sign):10

Did the worker get a bonus ? (y/n): y

Enter bonus: 10
The total salary is $ 493.0 (overtime pay is $ 75.0 )

In [2]:
```

```
1. print("This program determines the weekly salary for an employee.",
2.       "\nThe salary is the sum of the hourly rate times the",
3.       "hours worked, plus the bonus.",
4.       "\nFor work hours exceeding 40 per week, an overtime rate",
5.       "of 1.5 is applied.",
6.       "\nThe user must indicate if the worker has received a",
7.       "bonus by answering a y/n question.",
8.       "\nInput consists of: hours worked, hourly rate, bonus.",
9.       "\nThe output is the total salary for this week.")
10.
11. hours_str = input("Enter the number of hours worked this week: ")
12. hours_float = int(hours_str)
13. salary_str = input("Enter the salary rate per hour (do not include the '$' sign):")
14. salary_float = int(salary_str)
15.
16.
17. if hours_float > 40:
18.     hours_ot_float = hours_float - 40
19.     overtime = (hours_ot_float * (salary_float *1.5))
20.     total = overtime + (40 * salary_float)
21. else:
22.     total = hours_float * salary_float
23.     overtime = 0.00
24.
25. bonus_bool = input("Did the worker get a bonus ? (y/n): ")
26.
27. if bonus_bool.lower() == 'y':
28.     bonus_str = input("Enter bonus: ")
29.     bonus_float = float(bonus_str)
30.     total = total + bonus_float
31.
32. print("The total salary is $", total, " (overtime pay is $", overtime, ")")
```

Problem 2

```
1 #-*- coding: utf-8 -*-
2 """
3 Created on Mon May 21 19:59:29 2018
4
5 @author: Kev-PC
6 """
7
8 import math
9 import pylab
10 import numpy as np
11
12 while True:
13     a = float(input("Enter a: "))
14     b = float(input("Enter b: "))
15     c = float(input("Enter c: "))
16
17     if ((b**2) - (4*a*c)) < 0:
18         print("\nno real solutions")
19
20     elif ((b**2) - (4*a*c)) > 0:
21         x1 = float((-b - math.sqrt(b**2 - 4*a*c)) / (2 * a))
22         x2 = float((-b + math.sqrt(b**2 - 4*a*c)) / (2 * a))
23         print("two solutions: x1=", x1, " x2=", x2)
24         x = np.linspace(-5,5, 100)
25         y = ((a*x*x) + (b*x) + c)
26         pylab.plot(x,y)
27
28     elif ((b**2) - (4*a*c)) == 0:
29         d = float((-b + math.sqrt(b**2 - 4*a*c)) / (2 * a))
30         print("one solution: ", d)
```

Usage

Here you can get help of any object by pre either on the Editor or the Console.

Help can also be shown automatically after to an object. You can activate this behavior

[New to Spyder? Read](#)

Variable explorer File explorer Help

IPython console

Console 12/A

Python 3.6.4 [Anaconda, Inc.] (default, Jan 16 2018, 10:22:32)

Type "copyright", "credits" or "license" for more information

IPython 6.2.1 -- An enhanced Interactive Python.

In [1]: runfile('E:/FAU/COP4045 - Python/HW1/p2.py', wdi

Enter a: 1

Enter b: 2

Enter c: 1

one solution: -1.0

Enter a: 3

Enter b: 0

Enter c: 1

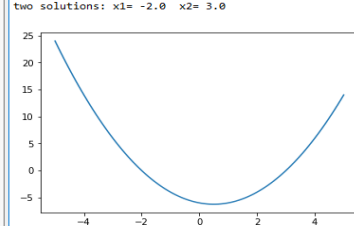
no real solutions

Enter a: 1

Enter b: -1

Enter c: -6

two solutions: x1= -2.0 x2= 3.0



```
1. import math
2. import pylab
3. import numpy as np
4.
5. while True:
6.     a = float(input("Enter a: "))
7.     b = float(input("Enter b: "))
8.     c = float(input("Enter c: "))
9.
10.    if ((b**2) - (4*a*c)) < 0:
11.        print("\nno real solutions")
12.
13.    elif ((b**2) - (4*a*c)) > 0:
14.        x1 = float((-b - math.sqrt(b**2 - 4*a*c)) / (2 * a))
15.        x2 = float((-b + math.sqrt(b**2 - 4*a*c)) / (2 * a))
16.        print("two solutions: x1=", x1, " x2=", x2)
17.        x = np.linspace(-5,5, 100)
18.        y = ((a*x*x) + (b*x) + c)
19.        pylab.plot(x,y)
20.
21.    elif ((b**2) - (4*a*c)) == 0:
22.        d = float((-b + math.sqrt(b**2 - 4*a*c)) / (2 * a))
23.        print("one solution: ", d)
24.
```

Problem 3

```
1 # -*- coding: utf-8 -*-
2 """
3 Created on Mon May 21 21:17:28 2018
4
5 @author: Kev-PC
6 """
7
8 while True:
9     money = input("Enter amount: ")
10    money = float(money)
11
12    q = int(money / .25)
13    qmoney_total = money - (q * .25)
14    round(qmoney_total, 3)
15    d = int((qmoney_total + .0001) / .10)
16    dmoney_total = qmoney_total - (d * .10)
17
18    p = int((dmoney_total + .0001) / .01)
19    pmoney_total = dmoney_total - (p * .01)
20
21    ct = int(q + d + p)
22
23    print("$", money, "makes ", q, "quarters, ", d, "dimes ", "and ", p, "pennies ")
24    print("(", ct, " coins), total amount in coins: $", money)
```

Usage

Here you can get help of any object by either on the Editor or the Console.

Help can also be shown automatically to an object. You can activate this behavior by typing `help()` in the console.

[New to Spyder? Read the documentation](#)

Variable explorer

File explorer

Help

IPython console

Console 17/A

Python 3.6.4 [Anaconda, Inc.] (default, Jan 16 2018, 10:22: Type "copyright", "credits" or "license()" for more information)

IPython 6.2.1 -- An enhanced Interactive Python.

In [1]: runfile('E:/FAU/COP4045 - Python/HW/HW1/p3.py', wdir='E:/FAU/COP4045 - Python/HW/HW1')

Enter amount: .24
\$ 0.24 makes 0 quarters, 2 dimes and 4 pennies
(6 coins), total amount in coins: \$ 0.24

Enter amount: 10
\$ 10.0 makes 40 quarters, 0 dimes and 0 pennies
(40 coins), total amount in coins: \$ 10.0

Enter amount: 0
\$ 0.0 makes 0 quarters, 0 dimes and 0 pennies
(0 coins), total amount in coins: \$ 0.0

Enter amount: 99.99
\$ 99.99 makes 399 quarters, 2 dimes and 4 pennies
(405 coins), total amount in coins: \$ 99.99

Enter amount: 3.45
\$ 3.45 makes 13 quarters, 2 dimes and 0 pennies
(15 coins), total amount in coins: \$ 3.45

Enter amount: 5.25
\$ 5.25 makes 21 quarters, 0 dimes and 0 pennies
(21 coins), total amount in coins: \$ 5.25

Enter amount:

```
1. while True:
2.     money = input("Enter amount: ")
3.     money = float(money)
4.
5.     q = int(money / .25)
6.     qmoney_total = money - (q * .25)
7.     round(qmoney_total, 3)
8.     d = int((qmoney_total + .0001) / .10)
9.     dmoney_total = qmoney_total - (d * .10)
10.
11.     p = int((dmoney_total + .0001) / .01)
12.     pmoney_total = dmoney_total - (p * .01)
13.
14.     ct = int(q + d + p)
15.
16.     print("$", money, "makes ", q, "quarters, ", d, "dimes ", "and ", p, "pennies ")
17.     print("(", ct, " coins), total amount in coins: $", money)
```