

Problem Sets 1 Of Essentials Of Python

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1 Question 1

The program that reads the user's birth year and the current year from the input determines how many years, months, days, hours, minutes and seconds she has lived.

```
# base = float(input('length of base:'))
# height = float((input('measure of height:')))
base = 10
height = 12
area = base * height
print('area is: ',area)
```

area is: 120

2 Question 2

Create a Python program that takes the user's age as input and converts it into seconds. Display the result to the user.

```
ss = 3.156e7
# age = int(input('enter age:'))
age = 28
second = age * ss
print('second = ', second)
```

```
second = 883680000.0
```

3 Question 3

Develop a Python program that prompts the user to input an employee's salary. The program should then calculate and display the insurance and tax receipts for the employee, with insurance being 7% and tax being 10% of the salary.

```
# a = float(input('enter salary:'))
a = 1000
b = a * 0.07
m = a * 0.1
p = a - b - m
print('s= ', a, 'b = ', b, 'm = ', m, 'p = ', p)
```

```
s= 1000 b = 70.0 m = 100.0 p = 830.0
```

4 Question 4

Create a Python program that prompts the user to input the price of a product in the previous and current year. The program should calculate and display the inflation rate and the projected price of the product for the next year.

```
# y1 = int(input('enter price for first year:'))
# y2 = int(input('enter price for second year:'))
y1 = 100
y2 = 120
t = (y2 - y1) / y1
y3 = y1 * (1 + t) ** 2
print('inflation:', t, '\t\t price next year = ', y3)
```

```
inflation: 0.2          price next year = 144.0
```

5 Question 5

Develop a Python program that accepts user input for the current amount, interest rate, and number of years. The program should then calculate and display the projected value of the money for the specified number of years based on the provided interest rate.

```
# amt = int(input('enter amount:'))
# rate = float(input('enter rate:'))
# years = int(input('enter years:'))
amt = 400
rate = 22
years = 8
future_value = amt * ((1 + 0.01 * rate) ** years)
print('future value is %12.0f' %(future_value))
```

```
future value is          1963
```

6 Question 6

Create a Python program that prompts the user to input two numbers. The program should then calculate and display the sum, multiplication, division, subtraction, and remainder of the correct division between the two numbers.

```
# a = int(input('enter a:'))
# b = int(input('enter b:'))
a = 20
b = 12
print(a, ' + ', b, ' = ', a + b)
print(a, ' - ', b, ' = ', a - b)
print(a, ' * ', b, ' = ', a * b)
print(a, ' / ', b, ' = ', a / b)
print(a, ' % ', b, ' = ', a % b)
```

```
20  +  12  =  32
20  -  12  =   8
20  *  12  = 240
20  /  12  = 1.6666666666666667
20  %  12  =   8
```

7 Question 7

Develop a Python program that prompts the user to input a five-digit integer. The program should then separate its digits and display each digit with three spaces between them.

```
# n = int(input('enter a number between 10000 and 99999:'))
n = 12345
temp = n
r5 = temp % 10
temp = temp // 10
r4 = temp % 10
temp = temp // 10
r3 = temp % 10
temp = temp // 10
r2 = temp % 10
temp = temp // 10
r1 = temp % 10
print('result is', r1, ' ', r2, ' ', r3, ' ', r4, ' ', r5, ' ')
```

```
result is 1  2  3  4  5
```

8 Question 8

Create a Python program that prompts the user to input three numbers. The program should then sort the numbers without utilizing conditional commands or repetition loops.

```
# x = int(input('input first name:'))
# y = int(input('input second number'))
# z = int(input('input third number:'))
x = 10
y = 12
z = 11
a1 = min(x, y, z)
a3 = max(x, y, z)
a2 = (x + y + z) - a1 - a3
print('number is sorted order: ', a1, a2, a3)
```

number is sorted order: 10 11 12

9 Question 9

Develop a Python program that prompts the user to input two numbers. Without using auxiliary variables, the program should interchange their contents.

```
# x = int(input('enter x:'))
# y = int(input('enter y:'))
x = 13
y = 99
x = x + y
y = x - y
x = x - y
print('x =', x, 'y =', y)
```

x = 99 y = 13

10 Question 10

Create a Python program that prompts the user to input a character. The program should then display the ASCII code corresponding to the input character.

```
# ch = input('enter a char:')
ch = 'B'
print(ch, ' ', ord(ch))
```

B 66

11 Question 11

Develop a Python program that adds a specified number of seconds to the current time.

```
import datetime
# n = int(input('enter n:'))
n = 23
x = datetime.datetime.now()
y = x + datetime.timedelta(0, n)
print('current time is ', x.time())
print('new time is ', y.time())
```

```
current time is 07:04:27.078114
new time is 07:04:50.078114
```

12 Question 12

Create a Python program that reads the student number and grade point average of multiple students from the input. The program should identify the student with the second-highest grade point average and output their information.

```
id1 = -1
max1 = -1
max2 = -1
id2 = -1
n = int(input('enter n:'))
n = 2
if n < 2:
    print('enter a number grater than one')
else:
    for i in range(1,n+1):
        id = int(input('enter id:'))
        id = 100
        aver = float(input('enter average:'))
        if aver > max1:
            id2 = id1
            max2 = max1
            max1 = aver
            id1 = id
        else:
            if aver > max2:
                max2 = aver
                id2 = id
    print('max2 = ', max2, '\t', 'id2 = ', id2)
```

13 Question 13

Create a Python program that reads numbers from the input and determines whether each number is a perfect number or not.

```
while True:
    num = int(input('enter a number:'))
    sum = 0
    for i in range(1, num):
        if (num % i == 0):
            sum += i
```

```

if (sum == num):
    print('\t', 'perfect')
else:
    print('\t', 'not perfect')
yes = input('continue? Y or N')
if (yes[0] == 'N' or yes[0] == 'n'):
    break

```

14 Question 14

Create a Python program that generates the first n terms of the Fibonacci series.

```

f1 = 1
f2 = 1
# n = int(input('enter a number:'))
n = 4
if n == 1:
    print(f1)
elif n == 2:
    print(f1)
    print(f2)
else:
    print(f1)
    print(f2)
    i = 3
    while i <= n:
        f3 = f1 + f2
        print(f3, ' ')
        f1 = f2
        f2 = f3
        i = i + 1

```

```

1
1
2
3

```

15 Question 15

Develop a Python program that reads strings from the input and displays the characters separated by spaces.

```

# s = input('enter a string:')
s = 'saeed'
for i in s:
    print(i, end = ' ')

```

```
s a e e d
```

16 Question 16

Develop a Python program that prompts the user to input their birth year and the current year. The program should calculate and display the total years, months, days, hours, minutes, and seconds the user has lived.

```

# byy = int(input('enter birth date (year):'))
# bmm = int(input('enter birth date (month):'))
# bdd = int(input('enter birth date (day):'))
# cyy = int(input('enter current date (year):'))
# cmm = int(input('enter current date (month):'))
# cdd = int(input('enter current date (day):'))
byy = 1373
bmm = 9
bdd = 27
cyy = 1402
cmm = 5
cdd = 12
if cdd < bdd:
    cmm -= 1
    cdd += 30
day = cdd - bdd
if cmm < bmm:
    cyy -= 1
    cmm += 12
month = cmm - bmm
year = cyy - byy
days = day + month * 30 + year * 365
hh = days * 24
mm = hh * 60
ss = mm * 60
print('old is:', year, '/', month, '/', day)
print('hour is (hh:mm:ss):', hh, ':', mm, ':', ss)

```

```

old is: 28 / 7 / 15
hour is (hh:mm:ss): 250680 : 15040800 : 902448000

```