



Changsha University of Science and Technology

School of Computer and Communications Engineering

Experiment Course for Python Programming

The first time-the 3rd Week

Course Name: Python Programming

Grade: 2021 Fall

Major: Computer Science and Technology

Student ID: Gj2021009135 Chinese Name: 莫森

Name: Munasinghe Munagamage Don Ashan Dinisuru

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Experiment Course for Python Programming

The first time---the 3rd Week

(1) Programmer calculator

(Just for integer conversion) As a programmer, I often deal with binary numbers, decimal numbers, octal numbers and hexadecimal numbers. For example, convert decimal numbers to corresponding binary numbers, octal numbers, and hexadecimal numbers. This task requires writing Python code to convert the input decimal number into the corresponding binary number, octal number and hexadecimal number respectively. (tip: you can use `bin()`, `oct()` and `hex()` functions to implement)

Now----16:00pm

Paste your code here:

```
1 conversion_table = {0: '0', 1: '1', 2: '2', 3: '3', # Mapping of remainders to hexadecimal equivalent
2                     4: '4', 5: '5', 6: '6', 7: '7',
3                     8: '8', 9: '9', 10: 'A', 11: 'B',
4                     12: 'C', 13: 'D', 14: 'E', 15: 'F'}
5
6
7 def decimalToHexadecimal(decimal):
8     if decimal <= 0:
9         return ''
10
11     integer_part = int(decimal)
12     decimal_part = decimal - int(decimal)
13
14     integer_hex = ""
15     decimal_hex = ""
16
17     # Conversion of integer part to hexadecimal
18     while integer_part > 0:
19         remainder = integer_part % 16
20         integer_hex = conversion_table[remainder] + integer_hex
21         integer_part //= 16
22
23     # Conversion of decimal part to hexadecimal
24     while decimal_part > 0:
25         decimal_part *= 16
26         integer_part = int(decimal_part)
27         decimal_hex += conversion_table[integer_part]
28         decimal_part -= integer_part
29
```

```
28         decimal_part -= integer_part
29
30 if decimal_hex:
31     return integer_hex + '.' + decimal_hex
32 else:
33     return integer_hex
34
35
36 def dec2bin(number: float):
37     integer_part = int(number)
38     decimal_part = number - int(number)
39
40     ans = ""
41     if integer_part == 0:
42         return '0'
43
44     # Conversion of integer part to binary
45     while integer_part > 0:
46         ans = str(integer_part % 2) + ans
47         integer_part //= 2
48
49     if decimal_part == 0:
50         return ans
51     else:
52         ans += '.'
53
54     # Conversion of decimal part to binary
55     for i in range(8):
56         decimal_part *= 2
```

```

56         decimal_part -= 2
57         if int(decimal_part) == 1:
58             ans += '1'
59             decimal_part -= 1
60         else:
61             ans += '0'
62
63     return ans
64
65
66 def decimalToOctal(decimal):
67     integer_part = int(decimal)
68     decimal_part = decimal - integer_part
69
70     result = ""
71
72     # Conversion of integer part to octal
73     while integer_part > 0:
74         remainder = integer_part % 8
75         result = str(remainder) + result
76         integer_part //= 8
77
78     # Decimal part conversion to octal
79     if decimal_part != 0:
80         result += '.'
81
82         while decimal_part != 0:
83             decimal_part *= 8
84             temp = int(decimal_part)
85             result += str(temp)

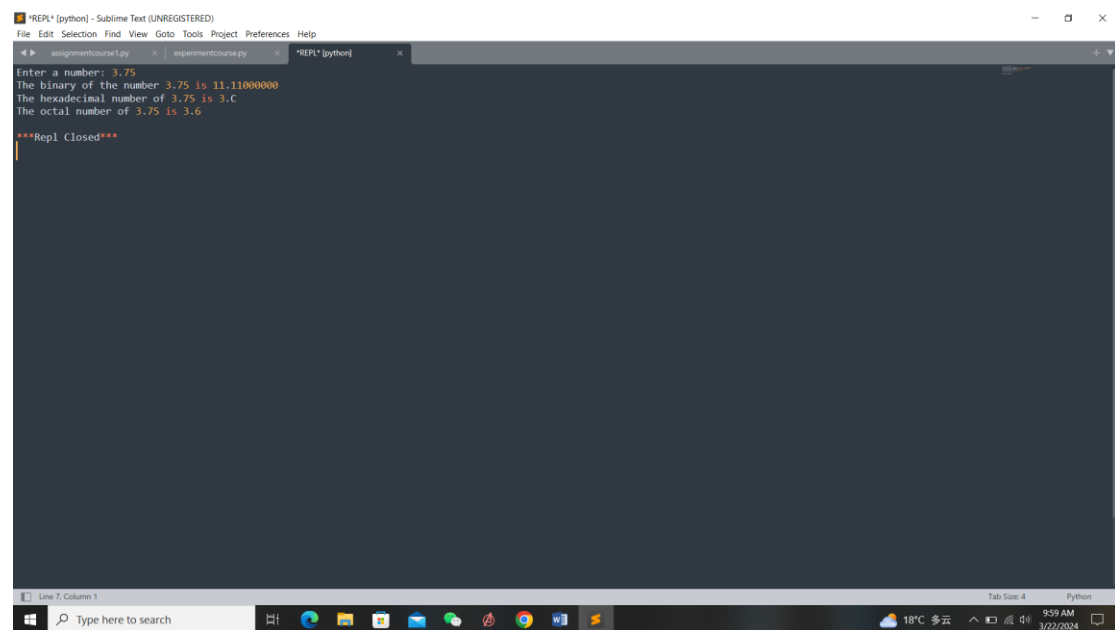
```

```

86         decimal_part -= temp
87
88     return result
89
90
91 def main():
92     number = float(input("Enter a number: "))
93     print(f"The binary of the number {number} is {dec2bin(number)}")
94     print("The hexadecimal number of", number, "is", decimalToHexadecimal(number))
95     print("The octal number of", number, "is", decimalToOctal(number))
96
97
98 if __name__ == "__main__":
99     main()
100
101

```

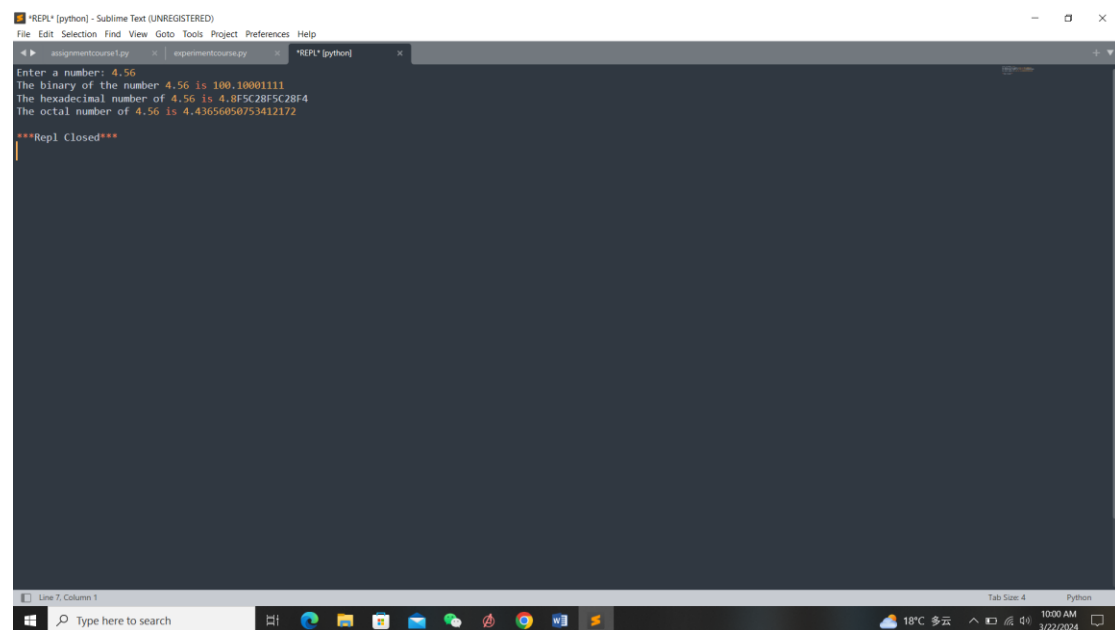
Paste your running results here:



The screenshot shows a Sublime Text editor window titled "*REPL* [python] - Sublime Text (UNREGISTERED)". The editor has three tabs: "assignmentcourse1.py", "experimentcourse.py", and "*REPL* [python]". The "*REPL* [python]" tab is active and displays the following output:

```
Enter a number: 3.75
The binary of the number 3.75 is 11.11000000
The hexadecimal number of 3.75 is 3.C
The octal number of 3.75 is 3.6
***Repl Closed***
```

The status bar at the bottom indicates "Line 7, Column 1" and "Tab Size: 4 Python". The Windows taskbar is visible at the bottom with a search bar and system tray showing 18°C and 8:59 AM on 3/22/2024.



The screenshot shows a Sublime Text editor window titled "*REPL* [python] - Sublime Text (UNREGISTERED)". The editor has three tabs: "assignmentcourse1.py", "experimentcourse.py", and "*REPL* [python]". The "*REPL* [python]" tab is active and displays the following output:

```
Enter a number: 4.56
The binary of the number 4.56 is 100.10001111
The hexadecimal number of 4.56 is 4.8F5C28F5C28F4
The octal number of 4.56 is 4.43656050753412172
***Repl Closed***
```

The status bar at the bottom indicates "Line 7, Column 1" and "Tab Size: 4 Python". The Windows taskbar is visible at the bottom with a search bar and system tray showing 18°C and 10:00 AM on 3/22/2024.

Send the word document to email: tangqiang@csust.edu.cn

More requirement: convert dec 3.75 into binary.

(2) Rate movies

"Shawshank Redemption" is a classic film, which has been highly praised at home and abroad. Write a program to evaluate the film. You can only enter the number 1 ~ 9 for scoring, and output the star rating (★) formed according to the user's scoring. You can output several stars as long as you score. (Note: when outputting multiple identical characters, you can use the * sign. If you want to output three A's, you can use `print('A'* 3)`) the reference output results are as follows:

Please rate a movie called Shawshank Redemption (only numbers 1 to 9 can be entered): 5
You for Shawshank Redemption ★★★★★

Paste your code here:

```
1 def rate_movie():
2     score = int(input("Please rate the movie 'Shawshank Redemption' (enter a number from 1 to 9):"))
3     if 1 <= score <= 9:
4         print("★" * score)
5     else:
6         print("Invalid score. Please enter a number from 1 to 9.")
7
8 rate_movie()
```

Paste your running results here:

```
*REPL* [python] - Sublime Text (UNREGISTERED)
File Edit Selection Find View Goto Tools Project Preferences Help
assignmentcourse1.py *REPL* [python]
Please rate the movie 'Shawshank Redemption' (enter a number from 1 to 9):77
Invalid score. Please enter a number from 1 to 9.

***Repl Closed***

Line 5, Column 1 Tab Size: 4 Python
Type here to search 18°C 多云 10:04 AM 3/22/2024
```

```
*REPL* [python] - Sublime Text (UNREGISTERED)
File Edit Selection Find View Goto Tools Project Preferences Help
assignmentcourse1.py *REPL* [python]
Please rate the movie 'Shawshank Redemption' (enter a number from 1 to 9):7
*****

***Repl Closed***

Line 5, Column 1 Tab Size: 4 Python
Type here to search 18°C 多云 10:04 AM 3/22/2024
```