



## **Homework #8**

**01286121 Computer Programming  
Software Engineering Program,  
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By

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1. We are going to do some conversions, from integer to binary and then from binary back to integer. It will give us a chance to play with if-elif-else and while statements, as well as a little string slicing.

### Your Task

Prompt for an integer input, convert the integer to a binary number string (there is no type for actual binary numbers so we just represent it as a string). We then take the string and turn it back into a regular integer.

```
while True:
```

```
    inpus = input("Enter an integer: ")
```

```
    try:
```

```
        x = int(inpus)
```

```
    except ValueError:
```

```
        print("Invalid input")
```

```
    if x < 0:
```

```
        print("Only positive integers are allowed")
```

```
        break
```

```
    if x == 0:
```

```
        print("It is 0")
```

```
        break
```

```
b = []
```

```
while(x>0):
```

```
    d = x%2
```

```
    b.append(d)
```

```
    x = x//2
```

```
b.reverse()
```

```
print("The binary equivalent of the number is ")
```

```
for i in b:
```

```
    print(i,end="")
```

```
b.reverse()
```

```

j = len(b)

i = 0

y = 0

while i < j :
    y += 2**i * b[i]

    i += 1

print("\n")

print("Converted back to integer,",y,"\n")

```

```

phatt@Macbook_Pro MINGW64 ~/OneDrive/Desktop/Code Files/Python/Computer Programming (Python)/8/HW
$ C:/Users/phatt/AppData/Local/Programs/Python/Python311/python.exe "c:/Users/phatt/OneDrive/Desk
hon)/8/HW/1.py"
Enter an integer: 10
The binary equivalent of the number is
1010

Converted back to integer, 10

Enter an integer: 0
It is 0

```

2. Write a Python program for reading a string from the user then printing the frequency distribution of each character occurring in the string (that is, the percentage of the length of the whole string).

```
x = input("Enter some text: ")
```

```
len = len(x)
```

```
char_count = {}
```

```
for i in x:
```

```
    if i in char_count:
```

```
        char_count[i] += 1
```

```
    else:
```

```
        char_count[i] = 1
```

```
print("-- Character Frequency Table --")
```

```
for char, count in char_count.items():
```

```
    percent= (count / len) * 100
```

```
    print(f"{char} = {percent:.2f}%")
```

```
phatt@Macbook_Pro MINGW64 ~/OneDrive/Desktop/Code Files/Python/Computer Programming (Python)/8/HW
$ C:/Users/phatt/AppData/Local/Programs/Python/Python311/python.exe "c:/Users/phatt/OneDrive/Desk
hon)/8/HW/2.py"
Enter some text: aaidcbbcdxi
-- Character Frequency Table --
a = 16.67%
i = 16.67%
d = 25.00%
c = 16.67%
b = 16.67%
x = 8.33%
```

3. Write a Python program for reading a string from the user then drawing a bar graph for the count of each character occurring in the string using the turtle module. Note: each bar has the height of 20 times of its character count, and the height of the vertical axis will be the same as the height of the tallest bar.

```
import turtle as t
```

```
x = input("Enter some text: ")
```

```
len1 = len(x)
```

```
char_count = {}
```

```
value = []
```

```
chars = []
```

```
for i in x:
```

```
    if i in char_count:
```

```
        char_count[i] += 1
```

```
    else:
```

```
        char_count[i] = 1
```

```
lencnt = len(char_count)
```

```
for char, count in char_count.items():
```

```
    chars.append(char)
```

```
    value.append(count)
```

```
maxi = max(value)
```

```
t.penup()
t.goto(-20*lencnt,0)
t.pendown()
t.left(90)
t.fd(20 * maxi)
t.left(90)
t.fillcolor("black")
t.begin_fill()
t.fd(5)
t.right(120)
t.fd(10)
t.right(120)
t.fd(10)
t.right(120)
t.fd(10)
t.right(120)
t.end_fill()
t.penup()
t.goto(-20 * lencnt,0)
t.pendown()

t.right(180)
t.fd((30 * lencnt)+ 30)
t.left(90)
t.fillcolor("black")
t.begin_fill()
t.fd(5)
t.right(120)
t.fd(10)
t.right(120)
t.fd(10)
t.right(120)
t.fd(10)
t.right(120)
t.end_fill()
t.penup()
```

```
t.goto(-20 * lencnt,0)
```

```
t.pendown()
```

```
t.right(90)
```

```
for i in range(lencnt):
```

```
    t.fd(20)
```

```
    t.penup()
```

```
    pos1 = t.xcor()
```

```
    pos2 = t.ycor()
```

```
    t.goto(pos1 +5,pos2 -20)
```

```
    t.pendown()
```

```
    t.write(chars[i])
```

```
    t.penup()
```

```
    t.goto(pos1,pos2)
```

```
    t.pendown()
```

```
    t.left(90)
```

```
    t.fd(value[i] *20)
```

```
    t.right(90)
```

```
    t.fd(10)
```

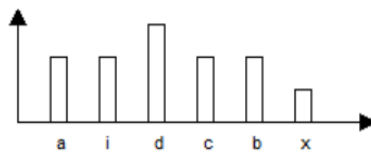
```
    t.right(90)
```

```
    t.fd(value[i] *20)
```

```
    t.left(90)
```

```
t.hideturtle()
```

```
t.done()
```



4. An ISBN-10 (International Standard Book Number) consists of 10 digits. The last digit, d<sub>10</sub>, is checksum

$x = (\text{input}(\text{"Enter the first 9 digits of an ISBN-10 as a string:"}))$

if  $\text{len}(x) \geq 10$  or  $\text{len}(x) < 9$ :

$\text{print}(\text{"Invalid input"})$

$\text{checksum} = (\text{int}(x[0]) * 1 + \text{int}(x[1]) * 2 + \text{int}(x[2]) * 3 + \text{int}(x[3]) * 4 + \text{int}(x[4]) * 5 + \text{int}(x[5]) * 6 + \text{int}(x[6]) * 7 + \text{int}(x[7]) * 8 + \text{int}(x[8]) * 9) \% 11$

if  $\text{checksum} == 10$ :

$\text{print}(\text{f"Your ISBN-10 number is {x}X"})$

else:

$\text{print}(\text{f"Your ISBN-10 number is {x}{checksum}"})$

```
phatt@Macbook_Pro MINGW64 ~/OneDrive/Desktop/Code Files/Python/Computer Programming (Python)/8/HW
$ C:/Users/phatt/AppData/Local/Programs/Python/Python311/python.exe "c:/Users/phatt/OneDrive/Desktop/8/HW/4.py"
Enter the first 9 digits of an ISBN-10 as a string:013601267
Your ISBN-10 number is 0136012671
```

```
phatt@Macbook_Pro MINGW64 ~/OneDrive/Desktop/Code Files/Python/Computer Programming (Python)/8/HW
$ C:/Users/phatt/AppData/Local/Programs/Python/Python311/python.exe "c:/Users/phatt/OneDrive/Desktop/8/HW/4.py"
Enter the first 9 digits of an ISBN-10 as a string:013031997
Your ISBN-10 number is 013031997X
```