Dictionaries & Tables

COSC 101: Intro to Computing I
November 6, 2017
Write python code that stores the data from the following table as: `pres_list` (a list of lists) and `pres_dict` (a dictionary)

<table>
<thead>
<tr>
<th></th>
<th>&lt;=169cm</th>
<th>170– 174cm</th>
<th>175– 179cm</th>
<th>180– 184cm</th>
<th>&gt;=185cm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presidential Candidates</td>
<td>6</td>
<td>12</td>
<td>14</td>
<td>21</td>
<td>23</td>
</tr>
<tr>
<td>Presidents</td>
<td>3</td>
<td>8</td>
<td>6</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>Unsuccessful Candidates</td>
<td>3</td>
<td>4</td>
<td>8</td>
<td>10</td>
<td>12</td>
</tr>
</tbody>
</table>
What is the output of the following program? If there are any errors, correct them.

```python
table = [ [1,2,3],
          [4,5,6],
          [7,8,9] ]

val_1 = table[1][1]
val_2 = table[2][2]
print(val_1 + val_2)
```

Output: 3
When should we use list of lists to store table data and when should we use a dictionary?
Write a function called `tabL_to_tabD` that converts a list-of-lists table to a dictionary table.

```python
def tabL_to_tabD( tabL ):
    ''' ( list<list<int>> )
           -> dict<(int,int):int>
    Creates and returns a dictionary from the data in tabL. The values in the dictionary are the non-zero values from tabL and the keys are tuples containing the row and column indices of that value.
    '''
```

Write a function called `tabD_to_tabL` that converts a dictionary table to a list-of-lists table.

```python
def tabD_to_tabL( tabD ):
    ''' ( dict<(int,int):int> )
    -> list<list<int>>
    Creates and returns a list of lists from the data in tabD. The values in the lists come from the values in the dictionary, their positions determined by the keys. Remaining places are filled with 0s.
    '''
```

Write a function called `tabl_histogram` that returns a string that when printed is a histogram. Your function will take two parameters: a list-of-lists (table) and an integer (index of row to be visualized).

```python
pres_list = [ ['','<=169cm','170–174cm','175–179cm','180–184cm','>=185cm'], ['Presidential Candidates',6,12,14,21,23], ['Presidents',3,8,6,11,11], ['Unsuccessful Candidates',3,4,8,10,12] ]

Presidents:
------------
<=169cm  X X X
170–174cm X X X X X X X X X
175–179cm X X X X X X X
180–184cm X X X X X X X X X X X
>=185cm  X X X X X X X X X X X
```