CS521 Homework 2
Name: Yuxiao Wu
GitHub: github.com/yuxiao-wu
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No collaborators, no late day used
Source: How to Think Like a Computer Scientist: Interactive Edition, textbook

Problem 1 (7 points)

Rewrite this following "for" loop as a "while" loop:

```
for i in range(1, X+1):
    if X % i == 0:
        print(i)
```

```
i = 1
while i < X + 1
    if X % i == 0:
        print(i)
    i+=1
```

Problem 2 (7 points)

What is the output of the following code? Show your work, including how x, i, and j change as the code runs.

```
i = 0
j = 0
while i<10:
    for x in range(3):
        j+=2
        i+=1
print(i,j)
```

X	j	i
0	2	1
1	4	2
2	6	3
0	8	4
1	10	5
2	12	6
0	14	7
1	16	8
2	18	9
0	20	10
1	22	11
2	24	12

Output: 12 24

Problem 3 (10 points)

Briefly explain the following errors and an example that could cause them:

- ZeroDivisionError
- TypeError
- NameError
- SyntaxError
- IndexError

- **ZeroDivisionError** will raise when the second operand of a division or module operation is zero.
  For example: x / 0
- **TypeError:** will raise when a function or operation is applied to an object of an incorrect type.
  For example: 1 + "Hello"
- **NameError:** raised when a variable is not found in the scope.
  For example: using a variable in expression when not declared.
- **SynatxError:** Raised by the parser when a syntax error is encountered
  For example: whlle x > 8
- **IndexError:** Raised when the index of a sequence is out of range.
  Example: list = [1,2,3]
           list[3]

Problem 4 (6 points)

What is the value of lines $2, 4, 5, 6, 9$, and 11? Assume the lines are executed in order and errors may occur (as if they are separate notebook cells).

1. d = {'apples': 15, 'bananas': 35, 'grapes':12}

2. d['banana']

3. d['oranges']=20

4. **len**(d)

5. 'grapes' **in** d

6. d['pears']

7. fruits = **list**(d.keys())

8. **sorted**(fruits)

9. **print**(fruits)

10. **del** d['apples']

11. 'apples' **in** d

Line 2: KeyError, banana is not defined

Line 4: 4

Line 5: True

Line 6: KeyError

Line 9: ['apples', 'bananas', 'grapes', 'oranges']

Line 11: False