Programming Languages and Techniques

Midterm

Please write your name (your official name please) and email in the space provided below. Do not turn over the page until the instructor allows you to.

Remember to answer in the space provided. And remember you can write on the back of each sheet. There are some questions where you do not see space provided. The intent there is that you use the back of the sheet.
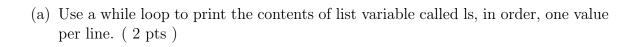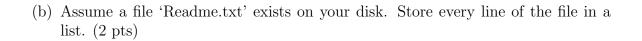
Name

Email

Problems

1. What does the function fancyDate do for the inputs listed in the bullet points below. If the function throws an error, just say it throws an error. (1 point for each input)

```
def fancyDate (date):
    monthNames = ['January', 'February', 'March', 'April', 'May', 'June', 'July'
     , 'August', 'September', 'October', 'November', 'December']
    month, day, year = date.split('/')
    print "this is the " + day + " rd" + " day of " + monthNames[int(month)-1] +
        " in the year "  + year
```

- '1/1/2013'

- '3/5/1980'

- '31/10/2011'

2. Suppose you have been given a class Rectangle and you want to define a class Square. Write just the first line of definition of the class Square. Remember that every square is a rectangle. [1 pt]

3. Assume lst = [[1,2], {1:'a', 2:'b'}.values(), 3, 4, 5]
   Then write out the result of

   (a) lst[:3] (1 pt)

   (b) lst.append('abcd') (1 pt)

   (c) lst.append(lst.append('3')) (bonus for 1 point)

4. For each of the following, write the answer as compactly as possible. That is do not write too many Python statements in answering this.

(a) Use a while loop to print the contents of list variable called ls, in order, one value per line. (2 pts)

(b) Assume a file 'Readme.txt' exists on your disk. Store every line of the file in a list. (2 pts)

(c) Assume you have a dictionary variable called dictionary. Write this dictionary to the file 'dict.txt' with each key value pair being written on a separate line in the form key : value. (2 pts)

(d) Use a map and lambda expressions to square everything in the list a = [1,2,3,4] (2 pts)

5. What do the following list comprehensions return? If the output list contains strings do not forget to put the quotes!

- lst = ['cit590', 'cse262', 'ese251', 'eng101']

  [x[:3] for x in lst] (1 pt)

  [x[3:] for x in lst if 'cit' in x] (1 pt)

- lst = range(1,10)

  [x*x for x in lst if x in lst[1:4]] (1 pt)

- d = {'arvind':'Levine 268', 'donna': 'Towne 111', 'srijani': 'LRSM 58'}

  [d[i].split()[0] for i in d.keys() if i.startswith('a')] (2 pts)

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6. What does this function do? (2 pts) Write the answer in just one or two English sentences. No partial credit on this one, sorry.

```python
def meanie(lst):
    if len(lst) == 1:
        return lst[0]
    firstHalf = lst[:len(lst)/2]
    secondHalf = lst[len(lst)/2:]
    return (meanie(firstHalf) + meanie(secondHalf))/2.0
```

7. Find the bugs in the following programs. bugs = bad things happening or things not working as per specifications. Once you have found the bug fix it (3 pts each)

```python
def myFavouriteLoopingFunction(a):
    '''print a 10 times'''
    count = 0
    while count < 10:
        print a
    count += 1
```

```python
def writeSomeTextToMyResume(text):
    '''write something to my resume'''
    f = open('myResume.txt', 'r')
    f.write('abcd')




def average(lst):
    '''compute the average value in a list'''
    return sum(lst)/len(lst)
```

8. Assume you are within a unit test class and you want to test a function called revString that reverses a string. Write a test method for that. (3 pts)

9. Write a function to reverse a string without using the list function reverse. (5 pts)

10. Translate the following Python statements to Java (2 pts)

    x = 5

    print 'Hello World'