

Name: _____ Recitation: _____ Andrew Id: _____

15-112 Summer 2018 Quiz 1

Up to 50 minutes. No calculators, notes, books, or computers. Do not use any topics that were not taught on day1, day2, day3, or day4. In particular, do not use lists or recursion. Show your work!

1. (5 points) **True or False**

Write "True" or "False" in each blank below.

_____ You can only use one grace day on a homework.

_____ After you use your 2 grace days, you can still submit a homework late with a penalty.

_____ Excessive absences without approval may result in a lower letter grade regardless of a student's numerical average in the course.

_____ The maximum course grade you can get with AMG is a C.

_____ The lowest 2 homeworks and the lowest quiz are all half weighted.

2. (20 points) **Code Tracing**

Indicate what the following programs print. Place your answers (and nothing else) in the box under the code.

(a) (10 points) CT1

```
def f(s1,s2,c):
    return s2[-(s1.find(c))] # hint: don't miss the negative!

def ct1(s1,s2):
    result = ""
    for c in s1:
        print("%s : %s" % (c, f(s1,s2,c)))
        result = c + result
    return result
print(ct1("abcd", "efgh"))
```

(b) (10 points) CT2

```
def ct2(n,m):
    for i in range(n, 7):
        for j in range(m, -2, -1):
            i = abs(i)
            j = abs(j)

            if i % 2 == 0:
                print("even", i)
            elif i > 0:
                print("foo", i)

            if j % 2 == 1:
                print("odd", j)
            if j > 0:
                print("bar", j)

        print("almost done!")
    print("done!")
ct2(5,-1)
```

3. (10 points) **Reasoning Over Code:** Find an argument (the value of x) for `roc1` that makes it return `True`. Place your answer (and nothing else) in the box to the right of the code.

```
def f(x):
    return x % 1000
def g(x):
    return x // 1000

def h(x,y):
    x = str(x)
    y = str(y)
    if x == y:
        return False
    return x == y[::-1]

def roc1(x):
    if not(type(x) == int):
        return False
    if len(str(x)) != 6:
        return False
    return h(f(x), g(x))
```

4. (25 points) **Free Response:** Write the function `isValidAndrewID(s)` that takes in a string `s` and returns `True` if `s` is a valid andrew ID and `False` if it is not.

A valid andrew ID satisfies the following constraints:

- has length at least 3
- is all lower case
- contains all letters except for an optional number at the end

For example `"jsmith1"` and `"jsmith"` are valid andrew IDs. `"Jsmith"`, `"js"`, and `"j2smith"` are not.

Note: You may *not* use lists in your solution.

5. (40 points) **Free Response:** A positive number n is considered "42ish" if the number has exactly one digit that is a 4, and exactly one digit that is a 2 (where the 4 and 2 may appear in any order).

For example:

`is42ish(412) == True`

`is42ish(24) == True`

`is42ish(42) == True`

`is42ish(4412) == False`

Write the function `nth42ish(n)`, which takes a non-negative integer n and returns the n th "42ish" number. `nth42ish(0)` should return 24. The first several 42ish are: 24, 42, 124, 142, 204, 214, 234, 240, 241, 243.

Note: You may *not* use strings or lists in your solution.