

Python for Math and Stat Fall 2023

Exam 2

Assume that all necessary packages have been imported.

1. (20 pts) For the following 4 problems, write down what each code block would display if executed in a Jupyter cell. If the code generates an error or infinite loop, write Error.

(a)

```
date = 'Nov 3 2023'
date.split('2')
```

(b)

```
yr = 2023
f'yr {yr/100: 4.1f}'
```

(c)

```
num = 123456789
result = []

while num % 10 > 5:
    num //= 1000
    result.append(num)
result
```

(d)

```
def func(alist):
    print(alist, end=' ')
    if len(alist) == 1:
        return 10

    return func(alist[1:]) + 10

func([6, 8, 2])
```

Solution:

(a) ['Nov 3 ', '0', '3']

(b) 'yr 20.2'

(c) [123456, 123]

(d) [6, 8, 2] [8, 2] [2]
30

2. (10 pts) Write a function `dimonds(n)` that uses `plt.fill()` to display a row of `n` overlapping

4. (10 pts) For user accounts on the Buffers.com site, passwords must contain at least 6 characters with at least one letter and one digit. Write a function `is_valid(password)` that returns `True` if a user's password `password` satisfies the requirements. It returns `False` otherwise. Assume that `password` is a string.

Example: `is_valid('i8.cake')` returns `True` and `is_valid('late pie')` returns `False`.

Hint: You may wish to use the `.isalpha()` and `.isdigit()` methods which return `True` if a character is a letter or digit, respectively.

Solution:

This solution checks all the characters in `password` before returning.

```
def is_valid(password):
    if len(password) < 6:
        return False

    letter = digit = False
    for ch in password:
        if ch.isalpha():
            letter = True
        elif ch.isdigit():
            digit = True
    return letter and digit
```

```
i = 0
while not (letter and digit) and (i < passw_len):
    if passw[i].isalpha():
        letter = True
    elif passw[i].isnumeric():
        digit = True
    i += 1

return letter and digit
```