# COGS 18 Exam #1

Fill out your Name and PID here:

Name: _____

PID: _____

## Do not begin until instructed by Professor Ellis to do so.

**Exam Notes:**

- Put your PID at the top of each page.
- This is a closed book test. You may not use any resources other than your own brain and your writing utensil.
- All work should be your own. Keep your eyes on your own exam.
- If you are unsure of what any instructions means, raise your hand to ask a TA, IA or the Professor.
- You'll have until 9:50 to complete the exam.
- Answer all questions.
- Your exam should have 5 pages.
- There are 60 possible points.

PID:

**Part I: Variables & Operators** (22 pts)

*Q1. Variable Assignment* - In the space below, write three lines of code that define three different variables named `var_float`, `var_str`, and `var_bool`, storing a float, a string, and a boolean, respectively. (You get to choose the specific float, string, or boolean each variable stores.) (3 pts):

*Q2. Math Operators* - Write out how each expression will evaluate (3 pts):

```
(4 + 2) / 2                    _____________________
16 % 5                         _____________________
4 ** 2                         _____________________
2 * 4                          _____________________
'python'  +  'love'            _____________________
2 + 'python'                   _____________________
```

*Q3. Comparison Operators* - Write out how each expression will evaluate (2 pts):

```
3 <= 8                         _____________________
2 != 2                         _____________________
(3 >= 8) or (20 != 20)         _____________________
(12 < 20) and (20 == 20)       _____________________
```

*Q4. Boolean Operators* - Write out how each expression will evaluate (3 pts):

```
True and False                 _____________________
False or True                  _____________________
True or not False              _____________________
```

*Q5. Membership Operators* - Given the following two variables, write out how each expression will evaluate (4 pts):

```
my_string = 'I love COGS18!'
my_list = ['Sarah', 'Titan', 'Zijian']
```

```
'sarah' in my_list             _____________________
'love' in my_list              _____________________
'Titan' in my_list             _____________________
'COGS' in my_string            _____________________
```

*Q6.* Given the following code, what will be the output? (2 pts)

```
val_a = 4
val_b = 2
val_c = 3 + (2 * val_b/val_a)
print(val_c + 2)
```

*Your answer:* _____

PID:

*Q7.* For each of the types of variables below, specify whether it is *immutable (I)*, *mutable (M)*, or *neither (N)*. (2 pts)
For example, if it were mutable, write the letter M on the line to the right of the variable type.

lists _____
tuples _____
strings _____
integers _____

*Q8.* Draw the bracket used to create each of the following (3 pts):

tuple _____
dictionary _____
lists _____

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**Part II: Indexing** (11 pts)

*Q9.* Given a list `my_list`, how would you index each of the following conditions (3 pts):
Fill in your answer within the square brackets to the right. Note that if the list were [19, 8, 7, 6, 5] , the second *element* would be 8.

The fifth element in the list `my_list[ ]`
The second element from the end of the list `my_list[ ]`
Starting with the fourth element of the list to the end of the list `my_list[ ]`

*Q10.* Given the list below, write the line of code you would use to index the list and return the specified output (4 pts):

```
cogs18 = ['Devendra', 'Shreenivas', 'Andrew', 'Chau', 'Duolan',
          'Byungkwon', 'Severine', 'Stephen', 'Zekria']
```

Output A: `['Duolan', 'Byungkwon', 'Stephen']`

Output B: `['Devendra', 'Chau', 'Severine']`

*Q11.* Given the following dictionary, write a line of code on the left ***using*** **`cogs18_dict`** that would return the value at right (3 pts):

```
cogs18_dict = {'Devendra' : 'TA',  'Shreenivas' : 'TA', 'Ellis' : 'Prof'}
```

| Code | Output |
|---|---|
| _____ | `3` |
| _____ | `'Prof'` |
| _____ | `dict` |

*Q12.* Multiple Choice: Assuming the code below had executed, which of the following would NOT return an error? (1 pt)

```
var_1 = ('a', 'b', 'c')
var_2 = ['d', 'e', 'f']
```

A) `var_1[3]`
B) `var_2[4]`
C) `var_1[1] = 'z'`
D) `var_2[1] = 'z'`
E) `var_1 + var_2`

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**Part III: Control Flow - Conditionals & Loops** (17 pts)

*Q13.* Multiple Choice: In Python, which of the following choices is an *optional* component of a conditional statement? (1 pt)

A) `if`
B) `elif`
C) `for`
D) `while`
E) `tuple`

*Q14.* What is the difference between **`break`** and **`continue`**? (2 pts)

*Q15.* How many iterations of the following loop would execute? (2 pts)

```
ind = 2
while ind < 4:
    ind = ind + 1
```

My answer: _____

*Q16.* Given the following... (3 pts):

```
if cond_a:
    print('First Condition')
elif cond_b:
    print('Second Condition')
else:
    print('Third Condition')
```

if `cond_a = 7 >= 7` and `cond_b = 'word'`, what would be the output of the code? _____
if `cond_a = 7 > 7` and `cond_b = False`, what would be the output of the code? _____
if `cond_a = 7 > 7` and `cond_b = 3 == 3`, what would be the output of the code? _____

PID:

*Q17.* If the following code executed, what would be the value stored in the **`out_val`** after execution? (4 pts)

```
out_val = 0
for val in range(2, 11, 2):
    if(val <= 5):
        out_val = out_val + val
    else:
        break
```

My answer: _____

*Q18.* In real code, write a **`for`** loop that initializes a counter and then loops through the letters of your first name, increasing the counter by one for each letter in your name. The value stored in the counter at the end of your loop's execution should be the number of letters in your first name. (5 pts)

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**Part IV: Concepts** (10 pts)

*Q19.* For each of the following statements, circle *either* True or False (6 pts):

| | |
|---|---|
| Python determines/infers the type of the variable during assignment | True / False |
| A single = is used for both assignment and testing equality | True / False |
| Code blocks begin after a colon (`:`) in Python | True / False |
| Variables can begin with a number | True / False |
| Reserved words in Python are not allowed to be used as variable names | True / False |
| Booleans can be assigned one of three distinct values | True / False |

*Q20.* If you are working in a Jupyter notebook and assign integer values to three different variables and then restart your kernel, how many variables are stored in your namespace? (2 pts)

A) 0
B) 1
C) 3
D) Impossible to determine

*Q21.* In A2, you created a cipher writing code to do encryption and decryption. Explain briefly what encryption and decryption are (2 pts):