CS 301 - Fall 2018

Instructors: Tyler Caraza-Harter and Adalbert Gerald Soosai Raj

Midterm Exam 1 - 10%

(Last) Surname: _____   (First) Given name: _____

NetID (email): _____@ wisc.edu

IMPORTANT: Answers for all questions must be marked on a scantron. The answer marked on the scantron will be the only answer graded.

Fill in these fields (left to right) on the scantron form (use #2 pencil):
1. LAST NAME (surname) and FIRST NAME (given name), fill in bubbles
2. IDENTIFICATION NUMBER is your Campus ID number, fill in bubbles
3. Under ABC of SPECIAL CODES, write your lecture number and fill in:
    001 - MWF 8:50a (Tyler morning)
    002 - MWF 1:20p (Tyler afternoon)
    003 - TR 9:30a (Gerald)
4. Under F of SPECIAL CODES, write A (exam version), fill in bubble 0

You may only reference your notesheet. You may not use books, your neighbors, calculators, or other electronic devices on this exam. Please place your student ID face up on your desk. **Turn off and put away portable electronics now.**

When you're done, please hand in these sheets in addition to your filled-in scantron.

NUMBERED PAGES: 14

QUESTIONS: 35

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(USE FOR ANY SCRATCH WORK)

PSEUDOCODE (2 questions)

1. Consider a box with the name X and an initial value of 3.

   X | 3

   Code:
   1. Add 7 to the value in X and store it in X
   2. If the value in X is less than 10, then continue to step 3, otherwise skip to step 4.
   3. Add 10 to the value in X and store it in X
   4. Multiply 10 to the value in X and store it in X

   What is the final value in X after executing the above code?
   a. 3
   b. 10
   c. 200
   d. 17
   e. 100

2. Consider three boxes namely X, Y, and answer. Initial values in X, Y, and answer are 5, 0, and 0 respectively.

   X | 5   Y | 0   Answer | 0

   Code:
   1. If the value in X is 0 (zero), skip to step 5. Otherwise, go to step 2.
   2. Add the value in X with the value in Y and store it in Y.
   3. Subtract 1 (one) from the value in X and store it in X.
   4. Go to step 1
   5. Copy the value of Y to the answer box.

   What is the final value in the **answer** box after executing the above code?
   a. 5
   b. 10
   c. 120
   d. 15
   e. 0

TYPES (4 questions)

3. What is the type of the following? `1.0 + 2.0`
   a. int
   b. float
   c. str
   d. bool
   e. NoneType

4. What is the type of the following? `1/2`
   a. int
   b. float
   c. str
   d. bool
   e. NoneType

5. What is the type of the following? `"1" * 2`
   a. int
   b. float
   c. str
   d. bool
   e. NoneType

6. What is the type of the following? `1 == 2`
   a. int
   b. float
   c. str
   d. bool
   e. NoneType

EXPRESSIONS (5 questions)

7. What does this expression evaluate to? `(2 * 2 - 2 / 2) ** 2 + 1`
   a. 0
   b. 2
   c. 7
   d. 10
   e. 27

8. What does this expression evaluate to? (hint: "not" is higher precedence than "or")

   `3 != 3 / 3 or not 2 + 2 == 2 * 2 or 1 + 1 == 1 * 1`

   a. False
   b. True
   c. None
   d. NaN
   e. 0

9. What does this expression evaluate to? `"Hello" * 5`
   a. 5Hello
   b. Hello5
   c. "Hello"5
   d. HelloHelloHelloHelloHello
   e. None

10. What does this expression evaluate to? `True != (3 < 2)`
   a. -1
   b. None
   c. True
   d. False
   e. 0

11. What does this expression evaluate to (assume x is 4321)?

   `str(x // 1000) + 'K and ' + str(x % 1000)`

   a. 4K and 321
   b. 4Kand321
   c. 321K and 4
   d. 4.321K and 4
   e. 4K321

VARIABLES (4 questions)

12. Which single variable name below is valid?
   a. $area1
   b. 1st_area
   c. area-1
   d. area_1
   e. None of the above

13. Consider the following code:

```
a = 14
b = 20
c = a < b
```

What is the value of the c variable?
    a. True
    b. False
    c. "a < b"
    d. <class 'str'>
    e. None of the above

14. Consider the following code:

```
radius = -3
print(RADIUS ** 2)
```

What is printed?
    a. -3
    b. -6
    c. -9
    d. 9
    e. Invalid code; leads to an error

15. Consider the following code:

```
w = "x"
y = "z"
print(w + "w" + y)
```

What is printed?
    a. wwy
    b. wwz
    c. xwy
    d. xwz
    e. Invalid code; leads to an error

FUNCTIONS (7 questions)

16. What numbers are printed, and in what order?

```
def test_counter():
    x = -1
    x += 1
    print(x)

x = 20
test_counter()
test_counter()
test_counter()
```

    a. 1, 2, 3
    b. 0, 1, 2
    c. 0, 0, 0
    d. 21, 22, 23
    e. The program crashes

17. What is the value in y after the following code executes?

```
def func():
    print("sum")

    return 1
y = func()
```

    a. None
    b. "sum"
    c. 1
    d. "sum" and 1
    e. The program crashes

18. If a function does not explicitly return a value, then by default, it returns _____.
    a. None
    b. int
    c. double
    d. public
    e. 0

19. What numbers are printed, and in what order?

```
val = 1
def func():
    val = 4
    print(val)

func()
print(val)
```

    a. 1
    b. 1, 1
    c. 1, 4
    d. 4, 1
    e. 4, 4

20. Assume the predictPopulation function header looks like this:

```
def predictPopulation(stateName, yearA, yearB, growthRate =
0.1):
```

Which call to predictPopulation is INCORRECT?
    a. predictPopulation("Wisconsin", 2000, 2010)
    b. predictPopulation(growthRate=0.15, "Wisconsin", 2000, 2010)
    c. predictPopulation("Wisconsin", 2000, 2010, 0.2)
    d. predictPopulation("Wisconsin", 2000, 2010, 2)
    e. predictPopulation("Wisconsin", yearB=2010, yearA=2000)

21. What letters are printed, and in what order?

```
def get_letter(n):
    if n == 1:
        return 'X'
    else:
        return 'Y'
        return 'Z'

print(get_letter(3))
```

    a. X
    b. Y
    c. Z
    d. Y, Z

e. X, Y, Z

22. What is the output of the following code snippet?

```python
def area_of_circle(radius):
    area = 3.14 * radius ** 2
    return area

def volume_of_cylinder(radius, height):
    volume = area_of_circle(radius) * height
    return volume

print(volume_of_cylinder(1, 2))
```

    a. 3.14
    b. 6.28
    c. 12.56
    d. 25.12
    e. None

ERRORS (2 questions)

23. What kind of error is present in the following code?

```python
def fraction(numerator, denominator)
    return numerator / denominator
```

    a. Syntax
    b. Runtime
    c. Semantic
    d. There is no error

24. What kind of error is present in the following code?

```python
def fraction(numerator, denominator):
    return numerator / denominator

print(fraction(10, 0))
```

    a. Syntax
    b. Runtime
    c. Semantic
    d. There is no error

CONDITIONALS (6 questions)

25. Given the following code, what is printed on the screen?

```
name = "TA"
if name == "Tyler" or name == "Gerald":
    print("Instructor")
elif name == "Anthony":
    print("TA")
else:
    print("Student")
```

    a. Instructor
    b. TA
    c. Student
    d. Anthony
    e. _____ (nothing is printed)

26. Given the following code, which statement or statements will be executed?

```
value = 0.5
if value < 2:
    STATEMENT_1
if value < 1:
    STATEMENT_2
if value > 0.5:
    STATEMENT_3
else:
    STATEMENT_4
```

    a. STATEMENT_1
    b. STATEMENT_2
    c. STATEMENT_4
    d. STATEMENT_1, STATEMENT_2 and STATEMENT_4
    e. STATEMENT_1, STATEMENT_2 and STATEMENT_3

27. What is the output of the code snippet below?

```
def func(a, b):
   if a < b:
       return b - a
    return a - b

print(func(7, 3))
```

    a. 4
    b. 3
    c. -4
    d. 7
    e. Invalid code; leads to an error

28. What does myfunction do?

```
def myfunction(area1, area2, area3):
    if area1 > area2:
        if area1 > area3:
            return area1
        else:
            return area3
    elif area2 > area3:
        return area2
    else:
        return area3
```

    a. Calculates and returns the minimum area
    b. Calculates and returns the maximum area
    c. Calculates and prints the minimum area
    d. Calculates and prints the maximum area
    e. None of the above

29. What is the output of the following code snippet?

```
num = 6
if num % 2 == 0:
    print('divisible by 2')
elif num % 3 == 0:
    print('divisible by 3')
elif num % 6 == 0:
    print('divisible by 6')
else:
    print('not divisible by 2, 3, and 6')
```

    a. divisible by 2
    b. divisible by 3
    c. divisible by 6
    d. all of the above
    e. not divisible by 2, 3 and 6

30. The following code is supposed to print "Valid dice value" ONLY if the value in the variable `roll` is 1, 2, 3, 4, 5 or 6.

Is the code correct? If yes, mark option (a) below. If not, how would you change the if statement?

Assume that `roll` can take any positive or negative integer value.

```
if roll > 0 or roll < 7:
    print("Valid dice value")
```

    a. No changes necessary, the code is already correct
    b. if roll == 1 or 2 or 3 or 4 or 5 or 6:
    c. if roll > 0 and roll < 7:
    d. if not(roll < 1 and roll > 6):
    e. if roll == 1 or roll == 6:

LOOPS (5 questions)

31. How many times does the following code print "hi"?

```
i = 0
while (i < 3):
    print("hi")
    i = i + 1
```

    a. 0 times
    b. 2 times
    c. 3 times
    d. 4 times
    e. infinite (the loop never stops running)

32. What should PART1, PART2, and PART3 be replaced with so that the loop prints 300, 200, 100 (in that order)

```
i = PART1
while PART2:
    print(i)
    i += PART3
```

    a. 100, i <= 300, 100
    b. 300, i > 100, -100
    c. 300, i > 0, -100
    d. 400, i > 0, and -100
    e. 400, i >= 100, and -100

33. What is the output of the following code snippet?

```
num = 5
total = 0
while num > 0:
    total += num
    num -= 1
print('total =', total, '; num =', num)
```

    a. total = 15 ; num = 5
    b. total = 15 ; num = 0
    c. total = 14 ; num = 0
    d. total = 14 ; num = 5
    e. None of the above

34. What numbers are printed, and in what order?

```
i = 1
while True:
    if i % 3 == 0:
        break
    print(i)
    i = i + 1
```

    a. 1
    b. 1, 2
    c. 1, 2, 3
    d. 1, 2, 3, 4
    e. the loops never stops running and keeps printing numbers

35. What numbers are printed, and in what order?

```
i = 1
while i < 10:
    print(i)
    if i % 3 == 0:
        continue
    i = i + 1
```

    a. 1
    b. 1, 2, 4, 5, 7, 8
    c. 1, 2, 3, 4, 5, 6, 7, 8, 9
    d. 3, 6, 9
    e. the loops never stops running and keeps printing numbers

Congratulations on finishing your first exam in CS 301! :)