CS 301 - Fall 2017

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Midterm Exam 1 — 16.67%

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

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IMPORTANT: Answers for Dual and Multiple Choice questions *must* be marked on a scantron. The answer marked on the scantron will be the only answer graded for those portions. Answers for Fill-in-the-blank questions must be marked on this exam.

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 bubbles:
   001 - MWF 8:50a (Hobbes morning)
   002 - MWF 1:20p (Hobbes afternoon)
   003 - TR 9:30a (Alexi)
4. Under *F* of SPECIAL CODES, write **A** (exam version), fill in bubble **0**

I certify that I will keep my answers covered and do my best to not allow my exam paper to be viewed by another student during the exam or prior to completion of their exam. I also certify that I have not viewed or in any way used another's work in completing my answers. I understand that being caught allowing another to view my work or being caught viewing another's work are both violations of this agreement and either will result in automatic failure of the course and an academic misconduct letter to the Deans Office for myself and any other individuals involved.

Signature: _____

The following exam has 26 questions and is worth a total of 43 points. You will have 50 minutes to complete the exam. **Be sure to read through every question completely.**

1. **Dual Choice** — 13 questions worth 1 point each. Choose the *best* answer.
2. **Multiple Choice** — 9 questions worth 2 points each. Choose the *best* answer.
3. **Fill-in-the-blank** — 4 questions worth 3 points each. Be complete.

You may not use notes or books, your neighbors, or calculators or any other electronic devices on this exam. **Turn off and put away** any portable electronics now.

Disclaimer: the following are provided for your reference only, and the inclusion of information here does not guarantee it will be used on the exam.

Operator Precedence Table:

level	operator	description
	`( <expression> )`	grouping with parentheses
higher	`x[index]`	indexing
	`* / %`	multiplicative
	`+ -`	additive
↕	`< <= > >=`	relational
	`== !=`	equality
	`not`	logical not
	`and`	logical and
lower	`or`	logical or
	`= += *=`	(compound) assignment

Built-in functions:

`raw_input(p)`	Prompts the user for input using `p` and returns the user's input as a string.
`len(s)`	Return the length (the number of items) of an object.
`type(x)`	Returns the *data type* of the value stored in `x`.
`int(x)`	Returns the integer representation of `x`. `ValueError` if not possible.
`float(x)`	Returns the float representation of `x`. `ValueError` if not possible.
`str(x)`	Returns the string representation of `x`.

Constants and functions from the math module:

`math.sqrt(x)`	Returns the square root of `x` as a `float`.
`math.pow(x,y)`	Returns `x` raised to the power `y`. Converts both arguments to `float`s.
`math.pi`	The mathematical constant $\pi = 3.1415...$

Functions from the random module:

`random.randint(a,b)`	Return a random integer N such that `a <= N <= b`.

Dual Choice: Terminology

1. To **compare** a variable and a value to see if they are the same, use the _____ operator. (1)

   A. `==`

   B. `=`

2. A _____ evaluates to a **boolean** value. (1)

   A. concatenation

   B. condition

3. In the Python expression `a ** b`, the `**` part is called an _____ . (1)

   A. operand

   B. operator

4. A computer's _____ is a **short-term memory** device. (1)

   A. HDD/SSD

   B. RAM

5. A loop which **never ends** is classified as _____ . (1)

   A. infinite

   B. recursive

6. In the Python expression `math.sqrt(4)`, the `math` is called a _____ . (1)

   A. function

   B. module

7. In order to use the expression `math.sqrt(4)` in a program, one must _____ . (1)

   A. `import math`

   B. `import sqrt`

8. The variables listed in a function **header** are called the _____ . (1)

   A. arguments

   B. parameters

9. The **type conversion functions** are named after the types of their _____ . (1)

   A. return values

   B. arguments

True or False: Evaluating boolean expressions

10. `"5" != 5` (1)

    A. True

    B. False

11. `True or (True and False)` (1)

    A. True

    B. False

12. `15.0/2.0 > 15/2` (1)

    A. True

    B. False

13. `x == "F" or "S"` (Yes, you *can* answer this without knowing the value of `x`.) (1)

    A. True

    B. False

Multiple Choice: Reading code

14. What is the *data type* of `x` after the following line of code is executed, if the user enters `1` at the prompt? (2)

```
x = raw_input("Enter an integer:") * 5
```

    A. `str` (string)

    B. `int` (integer)

    C. `11111`

    D. This code produces a TypeError.

15. What is the *error* produced when the following code is executed? (2)

    Be careful! Pay attention to details when looking for errors.

```
if x < 5
  x = x / 0
```

    A. SyntaxError: invalid syntax

    B. NameError: name 'x' is not defined

    C. ZeroDivisionError: integer division or modulo by zero

    D. This code does not cause an error.

16. What is the *data type* of `x` after the following line of code is executed? (2)

```
x = len("a string I like") == 15
```

A. `bool` (boolean)

B. `NoneType`

C. `int` (integer)

D. `str` (string)

17. What is the *value* in `count` after the program exits the loop? (2)

```
count = 0
while count != 10:
   count = count + 2
```

A. The program does not exit the loop.

B. `12`

C. `11`

D. `10`

18. What is the *value* in `x` after the following line of code is executed? (2)

```
x = 4 + 5 % 2
```

A. `1`

B. `4.1`

C. `5`

D. `6`

19. What are the *possible values* for `x` after the following code is executed? Assume `x` is an integer. (2)

```
if x > 3:
   x = 2
if x < 3:
   x = 4
```

A. `4` or the original value of `x`

B. `2` or `4` or the original value of `x`

C. `2` or `4`

D. `4` only

20. What is the *value* in `x` after the following line of code is executed? (2)

```
x = "word1" + "word2"[1]
```

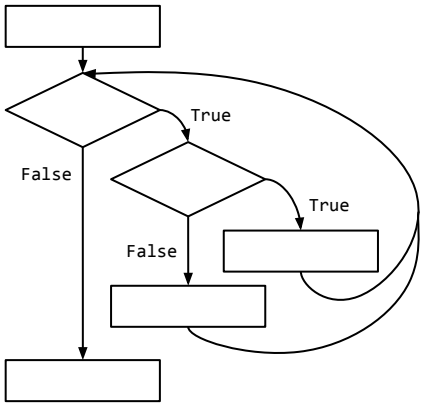
A. `"o"`

B. `"w"`

C. `"word1o"`

D. `"word1w"`

21. Which of the following best describes the control structure pictured in this flow chart? (2)



A. a `while` loop with an `if/elif` nested

B. an `if/else` with an `if/else` in the `if` branch

C. a `while` loop with an `if/else` nested

D. a `while` loop inside a `while` loop

22. What is the value in `x` after the following code executes? (2)

```
def some_function(n):
   print "The result is", n*4
x = some_function(5)
```

A. `None`, the function does not return a value.

B. `20`

C. `"The result is 20"`

D. `("The result is", 20)`

Fill-in-the-blank: Writing code

For each of the following questions, fill in the value, operator, or statement needed to produce the indicated output (check the comments if you need a hint). Pay attention to data types!

23. Complete the following condition so that the output will only display if the user's input is NOT `S` or `F`. (3)

```
user_type = raw_input("(S)tudent or (F)aculty:")

if _____________________________________:
      print "Invalid input, S or F only."
```

24. Modify the variable `num` *on the correct line* so that this loop produces the output: (3)

```
3 4 5 6 7
```

Note: one line will remain blank!

```
num = 2
while num < 7:
      _____________________
      print num,
      _____________________
```

25. Complete the following line of code so that the output is *exactly* `4444`. (3)

```
print _____________ math.sqrt(16) _____________
```

26. One of the lines below is indented; the other is not. Write a function call *on the correct line* so that this code produces *exactly* the output: (3)

```
This exam is:  DONE
```

Note: one line will remain blank!

```
def last_question(status):
      print "This exam is:", status

      ____________________________________________

user_input = raw_input("Status:")       # The user types in "DONE"

_____________________________________________
```