

Computer Science 217

Midterm Exam #1

Spring 2025

May 22, 2025

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First Name: _____

Last Name: _____

ID: _____

Instructions:

- Neatly print your names and ID number in the spaces above.
- Neatly print your names and ID number on both of the provided bubble sheets, and shade the circles for your ID number on both of the bubble sheets.
- Record your answer for question 1 on the appropriate bubble sheet. Record your answers for questions 2 to 19 on the traditional five-answer multiple-choice bubble sheet.
- Ensure that any errors made when recording answers on the bubble sheets are erased completely. Replacement bubble sheets are available if you are unable to completely erase your undesired response.
- Pick the **best answer** for each multiple-choice question.
- This exam consists of 7 pages, including the cover. Before answering any questions, count the pages and ensure that they are all present.
- You have 60 minutes to complete this exam. Extra time will **not** be provided to record your answers on the bubble sheets. Ensure that all of your answers have been recorded before the time limit is reached.
- Unless noted otherwise, each question is worth one mark.
- This exam is closed book. You are not permitted to use any electronic devices or reference materials.
- **DO NOT TURN PAST THIS PAGE UNTIL YOU ARE INSTRUCTED TO BEGIN.**

**Record the answers to the questions on this page on the provided bubble sheet.
Answers recorded in this question booklet will NOT be graded.**

Question #1:

[12 marks] Create a program that reads integers from the user until the user enters 0. As each integer is entered, it will be evaluated to determine if it is even or odd. Every even integer will be added to the total of the even values. Every odd integer will be added to the odd values total. Once the user enters 0, the program will display both the even values total and the odd values total, followed by a message that reports if the total of the even numbers was greater, or if the total of the odd numbers was greater, or if the totals were equal. The program will not display any other output (except for the prompts for input). If the first value entered by the user is 0, then the program should display 0 for each of the totals and report that they are equal.

Sample input and output is shown below. The values that were entered by the user are shown in bold.

```
Enter an integer (0 to exit): 1
Enter an integer (0 to exit): 2
Enter an integer (0 to exit): 0
Even total: 2   Odd total: 1
The even numbers had a higher total.
```

Additional sample input and output is shown below:

```
Enter an integer (0 to exit): 6
Enter an integer (0 to exit): 8
Enter an integer (0 to exit): 2
Enter an integer (0 to exit): 4
Enter an integer (0 to exit): 271
Enter an integer (0 to exit): 0
Even total: 20   Odd total: 271
The odd numbers had a higher total.
```

The expected output when the first value entered is 0 is shown below:

```
Enter an integer (0 to exit): 0
Even total: 0   Odd total: 0
The even and odd numbers had the same total.
```

A final example of input and output that includes negative integers is shown below:

```
Enter an integer (0 to exit): -5
Enter an integer (0 to exit): -6
Enter an integer (0 to exit): -7
Enter an integer (0 to exit): 0
Even total: -6   Odd total: -12
The even numbers had a higher total.
```

The statements needed to solve this problem can be found on the next page.

Record the answers to the questions on this page on the provided bubble sheet.
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Use the following lines to construct your solution. Record your answer onto the provided bubble sheet. Ensure that you follow the dashed vertical lines for any indented statements and that you shade the digits associated with each statement that you use. Statements can be used more than once. Some statements may not be needed. Any blank lines on the bubble sheet will be ignored.

```
1: elif odd_total > even_total:
3: elif odd_total < even_total:
5: else:
7: even_total = 0
9: even_total = even_total + 1
12: even_total = even_total + i
14: i = input(int("Enter an integer (0 to exit): "))
16: i = int(input("Enter an integer (0 to exit): "))
18: if even_total > odd_total:
23: if i % 2 == 0:
25: if i % 2 == 1:
27: odd_total = 0
29: odd_total = odd_total + 1
34: odd_total = odd_total + i
36: print("Even total:", even_total, " Odd total:", odd_total)
38: print("Even total: even_total Odd total: odd_total")
45: print("The even and odd numbers had the same total.")
47: print("The even numbers had a higher total.")
49: print("The odd numbers had a higher total.")
56: while i == 0:
58: while i != 0:
67: while i > 0:
```

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2. Which device was constructed from 17,468 vacuum tubes and completed in 1945?
 - A. Abacus
 - B. Babbage difference engine
 - C. ENIAC
 - D. Relay
 - E. Transistor

3. Which area focuses on the processes used by computer scientists to create, maintain and extend large computer programs?
 - A. Artificial intelligence
 - B. Distributed systems
 - C. Human computer interaction
 - D. Software engineering
 - E. Theory of computation

4. Which of the following is **not** a level of competence in Bloom's Taxonomy?
 - A. Analysis
 - B. Application
 - C. Comprehension
 - D. Evaluation
 - E. Hypothesis

5. Which of the following statements is most correct?
 - A. An algorithm cannot include instructions that loop back to a previous step
 - B. An algorithm may include lines, arrows and pictures
 - C. An algorithm must be written in a rigid, fixed, format
 - D. Exactly two of the above statements are correct
 - E. Answers A, B and C are all correct

6. Python is an example of a(n):
 - A. Algorithmic language
 - B. General purpose language
 - C. Human language
 - D. Low level language
 - E. Machine language

7. Which of the following sequences of characters is a valid / legal variable name in a Python program?
 - A. mr.data
 - B. r2-d2
 - C. roomba
 - D. Exactly two of the above answers are correct.
 - E. Answers A, B and C are all correct.

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8. Which type of error may be reported by Python for some input values provided to a program but not for other input values?
- A. Logic error
 - B. Runtime error
 - C. Syntax error
 - D. More than one of the above answers are correct.
 - E. None of the above answers are correct.
9. Consider a program which reads a number of grade points from the user and converts it to a letter grade. For example, if the user enters 4, then the program would display 'A'. If the user enters 1.7, then the program would display 'C-'. Which of the following statements should be used to read the number of grade points?
- A. `gp = float(input("Enter the number of grade points: "))`
 - B. `gp = input(float("Enter the number of grade points: "))`
 - C. `gp = input(int("Enter the number of grade points: "))`
 - D. `gp = int(float("Enter the number of grade points: "))`
 - E. `gp = int(input("Enter the number of grade points: "))`
10. Which of the following is the best definition for information?
- A. A numeric value stored in a computer
 - B. A sequence of bits that represents an integer or a character
 - C. A value without context or meaning
 - D. Numeric values obtained from investigation, study or instruction
 - E. The state of being of an object or system of interest
11. What is 123 base 5 equal to in base 10?
- A. 38_{10}
 - B. 57_{10}
 - C. 108_{10}
 - D. 123_{10}
 - E. 190_{10}
12. What is 119 base 10 equal to in base 11?
- A. $10A_{11}$
 - B. $9A_{11}$
 - C. 911_{11}
 - D. $A9_{11}$
 - E. AA_{11}
13. Which of the following characters is **not** available in the 7-bit ASCII character encoding scheme?
- A. A (capital letter A)
 - B. b (lower case letter B)
 - C. 3 (the digit 3)
 - D.) (closing round bracket)
 - E. é (lower case E with an accent)

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14. Which of the following is an example of a relational operator?

- A. =
- B. !=
- C. and
- D. Exactly two of the above answers is correct
- E. Answers A, B and C are all correct

15. Consider the following code segments:

# Segment 1	# Segment 2	# Segment 3	# Segment 4
if x < 1:	if x < 1:	if x < 1:	if x < 1:
print("A")	print("A")	print("A")	print("A")
else:	if x < 0:	elif x < 0:	if x < 0:
print("B")	print("B")	print("B")	print("B")

Which of the preceding code segments contains an example of a nested if statement?

- A. Segment 2
- B. Segment 4
- C. Segments 1 and 3
- D. Segments 2 and 4
- E. Segments 1, 3 and 4

16. Consider the following code segment:

```
if a == 0:
    print("X")
    a = 1
elif a > 0:
    print("Y")
    a = -1
else:
    print("Z")
```

If a is equal to 0 at the beginning of the segment, which letter(s) is/are displayed?

- A. X
- B. Z
- C. X and Y
- D. X and Z
- E. X, Y and Z

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17. Consider the following code segment:

```
if x < 1:
    print("A")
    if y > 0:
        print("B")
        y = y - 2
    elif y < 0:
        print("C")
        y = y + 2
else:
    print("D")
```

What letter(s) is/are displayed if x is initially 0 and y is initially 0?

- A. A
- B. A and B
- C. A and C
- D. A and D
- E. A, B, C and D

18. Which of the following statements is most correct?

- A. Any Python while loop can be re-written as a Python repeat-until loop
- B. Pre-tested loops always execute one or more times
- C. Python while loops are an example of a pre-tested loop
- D. The body of a Python while loop is always a compound statement
- E. More than one of the above statements is correct

19. Consider the following program:

```
i = int(input("Enter an integer: "))
x = int(input("Enter an integer: "))

while i < 7:
    if i < 4:
        x = x + 1
    i = i + x
    x = x * 2

print(i, x)
```

What numbers are displayed if the user enters 3 for i and 1 for x when it executes?

- A. 2 and 4
- B. 5 and 4
- C. 7 and 10
- D. 9 and 8
- E. 10 and 10