

Name: _____

Section: _____

Rules and Hints

- You may use one handwritten 8.5×11 " cheat sheet (front and back). This is the only additional resource you may consult during this exam. *No calculators.*
- Explain/show work if you want to receive partial credit for wrong answers.
- As long as your code is correct, you will get full credit. No points for style.
- When you write code, be sure that the indentation level of each statement is clear.

Grade

Problem	Your Score	Max Score
<i>Problem 1:</i> Trace code		35
<i>Problem 2:</i> Choose the correct answer		10
<i>Problem 3:</i> Write snippets of code		25
<i>Problem 4:</i> Write a complete program		30
Total		100

Problem 1: Trace code (35 points)

What will print to the screen when each of the following snippets of code is executed in PyCharm or in the Online Python Tutor?

Be very clear with spacing, line breaks, etc.

Treat each sub-problem as an independent question.

Problem 1A (4 points)

```
x = 120
print(x, 'x')
```

Problem 1B (4 points)

```
color = 'red'
print('I think', color, 'is a pretty color.', sep = '!')
```

Problem 1C (4 points)

```
a = 6 % 4
b = 6 // 4
c = 6 / 4
d = 6.0 // 4
print(a, b, c, d)
```

Problem 1D (6 points)

```
s1 = 'Sonoma '  
print(s1)  
s2 = s1  
s1 = 'State '  
print(s1, s2)  
s3 = s1  
s1 = s2  
s2 = s3  
s3 = 'University '  
print(s1, s2, s3)
```

Problem 1E (4 points)

```
for i in range(7):  
    print(i - 1)
```

Problem 1F (10 points)

```
k=0
for j in range(1, 4):
    for i in range(3):
        print(i, j)
        k = k + (i - j)
print(k)
```

Problem 1G (3 points)

```
y = 24
if y > 24:
    print('Yay')
elif y != 24:
    print('Boo')
else:
    print('Shoo')
```

Problem 2: Choose the correct answer (10 points)

Choose the letter corresponding to the correct answer for each of the following snippets of code when it is executed in PyCharm or in the Online Python Tutor.

Problem 2A (3 points)

What is the output of this program?

```
a = '2'  
b = '3'  
c = a + b  
print(c)
```

- A. 5
- B. 23
- C. 2 3
- D. ab

Problem 2B (4 points)

Assume i is an integer. Which one of these statements will yield a syntax error?

- A. `val = input(print('Enter value for person', i))`
- B. `val = input('Enter value for person', i)`
- C. `val = input('Enter value for person ' + str(i))`
- D. `val = print(input('Enter value for person '), i)`

Problem 2C (3 points)

Which of the following statements would evaluate the following condition : variable x is not equal to variable z

- A. `if (x != z):`
- B. `if not (x == z):`
- C. `if (x > z) or (x < z):`
- D. A and B.
- E. B and C.
- F. A and C.
- G. A, B and C

Problem 3: Write snippets of code (25 points)

Write snippets of code to do the following. Your code should only print the requested output. You will lose points for printing additional output.

You can assume that all your snippets are enclosed within a main function and that any necessary libraries have been imported. You only need to write the specific lines of code that accomplish each task.

Problem 3A (15 points)

Write a snippet of code that will ask the user for their height in inches and weight in pounds. It should print their height in meters (m.), mass in kilograms (kg.) and the body mass index (BMI). Use these conversion formulas:

- 1 kg is 2.2 pounds
- 1 inch is .0254 m
- $BMI = (\text{weight in kilograms}) / (\text{Height in meters} \times \text{Height in meters})$

You can assume that the user enters positive numeric values.

Problem 3B (10 points)

Based on the value of body mass index (BMI) computed in previous question, report the weight category as follows:

- BMI under 18.5: *underweight*
- BMI at least 18.5 and under 25: *normal weight*
- BMI at least 25 and under 30: *overweight*
- BMI of 30 or above: *overweight*

You may employ the same variable name you used in previous question or use the variable name *bmi* to denote the BMI.

Problem 4: Write a complete program (30 points)

For this problem, you must write a complete program. That includes a docstring, a `def main()`, any necessary library imports, etc.

Read the instructions carefully before you start coding! If you get stuck, try to maximize your partial credit.

Your program should:

- Ask the user how many temperatures they will enter. You may assume they enter an integer. If this integer is not positive, print an error message and do not print any further output.
- Prompt the user for that many temperatures in Celsius (C). Convert each temperature to Fahrenheit using the following formula, where C is the Celsius temperature:

$$\frac{9}{5} \times C + 32$$

- Print the average temperature in Fahrenheit
- Print the number of temperatures that were below freezing (0 degrees Celsius)
- Print the minimum temperature in Celsius

Here is an example of what your program might do. User input is *italicized and underlined*.

```
Enter number of temperatures: 4
Enter temperature (in Celsius): -15.67
Temperature in Fahrenheit: 3.7940000000000005
Enter temperature (in Celsius): 24
Temperature in Fahrenheit: 75.2
Enter temperature (in Celsius): 47.3
Temperature in Fahrenheit: 117.14
Enter temperature (in Celsius): -5.22
Temperature in Fahrenheit: 22.604
Average temperature = 54.6845 Fahrenheit
Number of temperatures below freezing = 2
Minimum temperature = -15.67 Celsius
```


Problem 4, continued