

Name: _____

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		40
<i>Problem 2:</i> Write snippets of code		30
<i>Problem 3:</i> Write a complete program		30
Total		100

Problem 1: Trace code (40 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.

All questions in this section are worth 4 points.

Problem 1A

```
x = 57.5
print(x)
```

Problem 1B

```
color = 'red'
print(color, 'color')
```

Problem 1C

```
a = 5
b = 2
c = a // b
d = a % b
print(c, d)
```

Problem 1D

```
y = 3**2
y = y + 2
print(y)
```

Problem 1E

```
x="SSU"  
y="ROCKS!"  
x=y  
y=x  
print(x, end = ' ')  
print(y)
```

Problem 1F

```
for i in range(2, 5):  
    print(i * 2)  
print("Done")
```

Problem 1G

```
k=0  
for i in range(1, 3):  
    for j in range(2):  
        print(i, j)  
    k = k + i + j  
print(k)
```

Problem 1H

```
q=10
if q > 5:
    print("cat")
if q <= 10:
    print("bat")
print("hat")
```

Problem 1I

```
grade = 90
if (grade > 90):
    print("You got an A!")
elif (grade >= 80):
    print("You got a B!")
else:
    print("You got something else.")
```

Problem 1J

```
q1 = 44 < 33
print(q1)
q2 = 11 != 22
print(q2)
q3 = q1 or q2
print(q3)
```

Problem 2: Write snippets of code (30 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 2A (10 points)

Assume:

- A variable A already exists and contains a value for you to use. Do not try to redefine A or overwrite its value.
- Assume that the math library has been imported.

Your task: If A is the area of a circle, compute and print the circumference.

Helpful facts:

- A circle is represented by radius r . The area of a circle = πr^2
- The circumference of the circle = $2\pi r$

Problem 2B (10 points)

Ask the user to enter their favorite sci-fi movie. If the user types "Martian" or "Interstellar", remark on their choice by saying "You are an out-of-space person.". If the user types "Iron-Man" or "Ant-Man", remark by asking "Are you into super-heroes?". For any other movie, remark by saying "I think you can do better!"

Problem 2C (10 points)

Ask the user to enter 300 integers. You can assume that the user only enters valid integers. After the user has entered all 300 integers, print the number of integers that are *multiples of 5*.

For **example**, the following sequence 2, 5, 12, 10, 27, 23, 25 has 3 integers (5, 10 and 15) that are multiples of 5 and, therefore, the program should output 3.

Problem 3: 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 do the following:

- Ask the user to enter the number of hours they slept per day for a month (30 days). You may assume they enter a valid number. If this number is not positive, print an error message and exit the program.
- After the user has entered all of their data, print the average number of hours the user slept during that month. If the average is between 6.5 to 8 hours, print "That's a healthy average!".
- Print the minimum number of hours and the maximum number of hours the user slept during that month along with the corresponding day (see below for an example)
- If during any day of the month, the user slept for less than 3 hours, print out a message saying "You should probably avoid caffeine!". This message should be displayed at most once.

Your program should match the sample output below. User input is *italicized and underlined*.

```
Enter hours of sleep on Day 1: 4.2
Enter hours of sleep on Day 2: 9
.
.
.
Enter hours of sleep on Day 30: 7.5
```

```
Sleep analysis:
Average amount of sleep = 7.39 hours
That's a healthy average!
Maximum sleep of 11.2 hours on Day 16
Minimum sleep of 2.7 hours on Day 22
You should probably avoid caffeine!
```

Problem 3, continued