Quiz Topic 02: Basic Python

1 Basic Math

Note 1. You are responsible for all of the basic math operators and understanding how order of operations works. The quizzes will only test integer math that you should be able to complete easily with paper and pencil.

Problem 2. What is the output of the following python code?

```
x = 2 // 3
y = x * 4
z = y + 5
print("z=", z)
```

Fraction of LLMs with correct answer: 13 / 13 = 1.00

Problem 3. What is the output of the following python code?

```
x = 3 // 2
y = x % 4
z = y - 5
print("z=", z)
```

Fraction of LLMs with correct answer: 12 / 13 = 0.92

Problem 4. What is the output of the following python code?

```
x = 3 // 2 # 4
y = x % 4
z = y - 5 # 2 - 1
print("z=", z)
```

Fraction of LLMs with correct answer: 12 / 13 = 0.92

Problem 5. What is the output of the following python code?

```
print(2 * 2 ** 2 + 3 * 4 % 2)
```

Fraction of LLMs with correct answer: 12 / 13 = 0.92

Problem 6. What is the output of the following python code?

```
print(2 ** 2 * 2 // 3 - 4 + 2)
```

Fraction of LLMs with correct answer: 11 / 13 = 0.85

2 if statements

Note 7. You are responsible for understanding basic boolean operations (and, or, not) and comparison operators (>=, >, <, <=, ==).

Problem 8. What is the output of the following python code?

```
x = 4%5
y = 4//5
if x == 1 or y == 1:
    result = 0
else:
    result = 1
print('result=', result)
```

Fraction of LLMs with correct answer: 11 / 13 = 0.85

Problem 9. What is the output of the following python code?

```
x = 4-5
y = 5-4
if x == 1 and y == 1:
    result = 0
else:
    result = 1
print('result=', result)
```

Fraction of LLMs with correct answer: 12 / 13 = 0.92

Note 10. In python, it is common to rely on "truthy" and "falsey" values rather than only the boolean values True and False.

Problem 11. What is the output of the following python code?

```
if '':
    result = 0
else:
    result = 1
print('result=', result)
```

Fraction of LLMs with correct answer: 11 / 13 = 0.85

Problem 12. What is the output of the following python code?

```
if 1.0:
    result = 0
else:
    result = 1
print('result=', result)
```

Fraction of LLMs with correct answer: 13 / 13 = 1.00

3 Loops

Note 13. You are responsible for understanding how while loops behave.

Problem 14. What is the output of the following python code?

```
i = 0
total = 0
while i < 5:
    total = total + i
    i += 1
print('total=', total)
```

Fraction of LLMs with correct answer: 13 / 13 = 1.00

Problem 15. What is the output of the following python code?

```
i = 3
total = 0
while i < 8:
    total = total * i
    i += 1
print('total=', total)
```

Fraction of LLMs with correct answer: 12 / 13 = 0.92

Problem 16. What is the output of the following python code?

```
i = 34567
total = 0
while i > 0:
    total += 1
    i //= 10
print('total=', total)
```

Fraction of LLMs with correct answer: 13 / 13 = 1.00

Note 17. Truthy/falsey values commonly are used within the condition of while loops in python, not just for if statements.

Problem 18. What is the output of the following python code?

```
i = 123
total = 0
while i:
    total += 1
    i //= 10
print('total=', total)
```

Fraction of LLMs with correct answer: 13 / 13 = 1.00

Note 19. For loops are much more common in python (and most other programming languages) because they are easier to reason about. Everything that a for loop can do, a while loop can also do. But a while loop can do things that for loops can't (like loop forever). It is considered good style to use for loops whenever possible. The hardest part about for loops is understanding the range function, which is commonly used with for loops.

Problem 20. What is the output of the following python code?

```
total = 0
for i in range(5):
    total = total - 1
print('total=', total)
```

Fraction of LLMs with correct answer: 13 / 13 = 1.00

Problem 21. What is the output of the following python code?

```
total = 0
for i in range(3, 5):
    total = total + 1
print('total=', total)
```

Fraction of LLMs with correct answer: 12 / 13 = 0.92

Problem 22. What is the output of the following python code?

```
total = 42
for i in range(10, 15, 1):
    total %= i
print("total=", total)
```

Fraction of LLMs with correct answer: 11 / 13 = 0.85

Problem 23. What is the output of the following python code?

```
total = 0
for i in range(10, 0, -2):
    total -= i
print("total=", total)
```

Fraction of LLMs with correct answer: 12 / 13 = 0.92

Note 24. Nested for loops are very common with lists. You will need to implement many nested loops in this class, and you can expect a problem with nested loops on almost every quiz for the remainder of the course.

Problem 25. What is the output of the following python code?

```
result = 1
for i in range(5):
    if i<3:
        result *= 1
    else:
        result *= (-1)
print('result=', result)
```

Fraction of LLMs with correct answer: 12 / 13 = 0.92

Problem 26. What is the output of the following python code?

```
result = 1
for i in range(3, 5):
    if i<3:
        result += 1
    else:
        result -= 1
print('result=', result)
```

Fraction of LLMs with correct answer: 12 / 13 = 0.92

Problem 27. What is the output of the following python code?

```
result = 1
for i in range(5):
    if i <= 3:
        result += i
    else:
        result += 1
print('result=', result)
```

Fraction of LLMs with correct answer: 11 / 13 = 0.85

Problem 28. What is the output of the following python code?

```
result = 1
for i in range(5):
    if i > 3:
        result += i
    else:
        result += 1
print('result=', result)
```

Fraction of LLMs with correct answer: 7 / 13 = 0.54

Problem 29. What is the output of the following python code?

```
total = 0
for i in range(10, 20, 5):
    if i%2 == 1 or i<15:
        total += i
print("total=", total)
```

Fraction of LLMs with correct answer: 11 / 13 = 0.85

Problem 30. What is the output of the following python code?

```
total = 0
for i in range(0, 10, 3):
    if i%2 == 0 or i<5:
        total += i
print("total=", total)
```

Fraction of LLMs with correct answer: 6 / 13 = 0.46

4 Lists

Note 31. A list is the most basic container type in python. For this quiz, you are responsible for how to read from a list, but not how to modify a list. You are responsible for the functions sum, min, and max; you are also responsible for understanding list slices and list indexing.

Problem 32. What is the output of the following python code?

```
1  xs = [1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21]
2  total = 0
3  total += xs[0]
4  total += xs[1]
5  total += xs[-3]
6  print('total=', total)
```

Fraction of LLMs with correct answer: 10 / 13 = 0.77

Problem 33. What is the output of the following python code?

```
1  xs = [1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21]
2  total = 0
3  total += xs[3]
4  total += xs[-1]
5  total += xs[0]
6  print('total=', total)
```

Fraction of LLMs with correct answer: 10 / 13 = 0.77

Problem 34. What is the output of the following python code?

```
1  xs = [1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21]
2  total = 0
3  total += xs[5]
4  total += xs[-5]
5  total += xs[-4]
6  print('total=', total)
```

Fraction of LLMs with correct answer: 7 / 13 = 0.54

Problem 35. What is the output of the following python code?

```
xs = [1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21]
ys = xs[3:5]
total = 0
total += ys[0]
total += ys[1]
total += ys[-1]
print('total=', total)
```

Fraction of LLMs with correct answer: 6 / 13 = 0.46

Problem 36. What is the output of the following python code?

```
xs = [1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21]
ys = xs[-5:-3]
total = 0
total += ys[0]
total += ys[1]
total += ys[-1]
print('total=', total)
```

Fraction of LLMs with correct answer: 6 / 13 = 0.46

Problem 37. What is the output of the following python code?

```
xs = [1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21]
ys = xs[-5:-3]
total = len(ys)
print('total=', total)
```

Fraction of LLMs with correct answer: 13 / 13 = 1.00

Problem 38. What is the output of the following python code?

```
xs = [1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21]
ys = xs[-5:-3]
total = sum(ys)
print('total=', total)
```

Fraction of LLMs with correct answer: 5 / 13 = 0.38

Problem 39. What is the output of the following python code?

```
xs = [1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21]
ys = xs[-3:-5]
total = sum(ys)
print('total=', total)
```

Fraction of LLMs with correct answer: 13 / 13 = 1.00

Problem 40. What is the output of the following python code?

```
xs = [1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21]
ys = xs[-3:-5:-1]
total = sum(ys)
print('total=', total)
```

Fraction of LLMs with correct answer: 5 / 13 = 0.38

Problem 41. What is the output of the following python code?

```
xs = [1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21]
ys = xs[:3]
total = sum(ys)
print('total=', total)
```

Fraction of LLMs with correct answer: 13 / 13 = 1.00

Problem 42. What is the output of the following python code?

```
xs = [1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21]
ys = xs[:3]
total = min(ys)
print('total=', total)
```

Fraction of LLMs with correct answer: 13 / 13 = 1.00

Problem 43. What is the output of the following python code?

```
xs = [1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21]
ys = xs[:3]
total = max(ys)
print('total=', total)
```

Fraction of LLMs with correct answer: 11 / 13 = 0.85

Problem 44. What is the output of the following python code?

```
xs = [1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21]
ys = xs[7:]
total = sum(ys)
print('total=', total)
```

Fraction of LLMs with correct answer: 9 / 13 = 0.69

Problem 45. What is the output of the following python code?

```
xs = [1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21]
ys = xs[-3:]
total = sum(ys)
print('total=', total)
```

Fraction of LLMs with correct answer: 12 / 13 = 0.92

Note 46. In practice, lists are almost always combined with for loops.

Problem 47. What is the output of the following python code?

```
xs = [1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21]
total = 0
for i in range(3):
    total += xs[i]
print('total=', total)
```

Fraction of LLMs with correct answer: 13 / 13 = 1.00

Problem 48. What is the output of the following python code?

```
xs = [1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21]
total = 0
for i in range(3, 8, 2):
    total += xs[i]
print('total=', total)
```

Fraction of LLMs with correct answer: 6 / 13 = 0.46

Problem 49. What is the output of the following python code?

```
xs = [1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21]
total = 0
for i in range(-3, -6, -1):
    total += xs[i]
print('total=', total)
```

Fraction of LLMs with correct answer: 7 / 13 = 0.54

Problem 50. What is the output of the following python code?

```
xs = [1, 3, 5]
total = 0
for x in xs:
    total += x
print('total=', total)
```

Fraction of LLMs with correct answer: 12 / 13 = 0.92

Problem 51. What is the output of the following python code?

```
xs = [1, 3, 5]
total = 0
for x in xs:
    for i in range(3):
        total += x*i
print('total=', total)
```

Fraction of LLMs with correct answer: 9 / 13 = 0.69

Problem 52. What is the output of the following python code?

```
xs = [1, 3, 5]
ys = [2, 4, 6]
total = 0
for x in xs:
    total += x
    for y in ys:
        total -= x*y
print('total=', total)
```

Fraction of LLMs with correct answer: 6 / 13 = 0.46

Problem 53. What is the output of the following python code?

```
xss = [[1, 3, 5], [2, 4], [0, 1, 2, 3, 4, 5]]
total = 0
total += xss[0][0]
total += xss[1][1]
total += xss[2][2]
print('total=', total)
```

Fraction of LLMs with correct answer: 11 / 13 = 0.85

Problem 54. What is the output of the following python code?

```
xss = [[1, 3, 5], [2, 4], [0, 1, 2, 3, 4, 5]]
total = 0
total += xss[1][0]
total += xss[0][1]
total += xss[0][2]
print('total=', total)
```

Fraction of LLMs with correct answer: 10 / 13 = 0.77

Problem 55. What is the output of the following python code?

```
xss = [[1, 3, 5], [2, 4], [0, 1, 2, 3, 4, 5]]
total = 0
for xs in xss:
    total += xs[0]
    for x in xs:
        total += x
print('total=', total)
```

Fraction of LLMs with correct answer: 6 / 13 = 0.46

Problem 56. What is the output of the following python code?

```
xss = [[1, 3, 5], [2, 4], [0, 1, 2, 3, 4, 5]]
total = 0
for i in range(2):
    for j in range(len(xss[i])):
        total += xss[i][-j]
print('total=', total)
```

Fraction of LLMs with correct answer: 5 / 13 = 0.38

Problem 57. What is the output of the following python code?

```
xss = [[1, 3, 5], [2, 4], [0, 1, 2, 3, 4, 5]]
total = 0
for i in range(2):
    for j in range(len(xss[i])):
        total += xss[i][-j]
print('total=', total)
```

Fraction of LLMs with correct answer: 6 / 13 = 0.46

5 Functions

Note 58. Functions allow you to reuse the same piece of code many times. A common acronymn for good programming is DRY (don't repeat yourself), and so functions are used all the time. Like nested for loops, expected many problems in the future quizzes to involve functions.

Problem 59. What is the output of the following python code?

```
x = 10
def foo(x):
    if x - 5:
        return 1
    else:
        x += 1
    return x
x += foo(4)
x += foo(5)
x += foo(6)
print("x=", x)
```

Fraction of LLMs with correct answer: 9 / 13 = 0.69

Problem 60. What is the output of the following python code?

```
x = 10
def foo(x):
    x += 2
    return x
x += foo(9 + 39 // 10) * 3
x += foo(9 + 19 // 10) * 2
print("x=", x)
```

Fraction of LLMs with correct answer: 6 / 13 = 0.46

Problem 61. What is the output of the following python code?

```
x = 10
def foo(x):
    if x % 2:
        return 1
    x -= 1
    return x
x += foo(4)
x += foo(5)
x += foo(6)
print("x=", x)
```

Fraction of LLMs with correct answer: 7 / 13 = 0.54

Problem 62. What is the output of the following python code?

```
x = 10
def foo(x):
    x += 1
    return x
x += foo(9 + 39 // 10) * 2
print("x=", x)
```

Fraction of LLMs with correct answer: 7 / 13 = 0.54

Problem 63. What is the output of the following python code?

```
x = 10
def foo(x):
    return x * 2
for i in range(3):
    x += foo(i)
print("x=", x)
```

Fraction of LLMs with correct answer: 11 / 13 = 0.85

Problem 64. What is the output of the following python code?

```
x = 10
def foo(x):
    if x - 5:
        return 1
    else:
        x -= 1
    return x
x += foo(4)
x += foo(5)
x += foo(6)
print("x=", x)
```

Fraction of LLMs with correct answer: 7 / 13 = 0.54

Problem 65. What is the output of the following python code?

```
x = 10
def foo(x):
    x += 2
    return x
x += foo(9 + 39 // 10) * 3
x += foo(9 + 39 // 10) * 2
print("x=", x)
```

Fraction of LLMs with correct answer: 6 / 13 = 0.46

Problem 66. What is the output of the following python code?

```
def foo(x):
    total = 0
    while x > 0:
        total += 1
        x //= 10
    return total
x = foo(100)
x += foo(1234567)
x += foo(3)
print("x=", x)
```

Fraction of LLMs with correct answer: 10 / 13 = 0.77

Problem 67. What is the output of the following python code?

```
def foo(x):
    total = 0
    while x > 0:
        total = total + x % 10
        x //= 10
    return total
x = foo(100)
x += foo(1234567)
x += foo(3)
print("x=", x)
```

Fraction of LLMs with correct answer: 6 / 13 = 0.46

LLM Model Performance