Python Strings

1 Basic String Operations

Note 1. Indexing and slicing of strings works similarly to indexing and slicing of lists. The main difference is that the *type* of the result when indexing/slicing a string is always another string.

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

```
s = 'hello␣world'
print(s[:-6])
```

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

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

```
s = '12345'
xs = [1, 2, 3, 4, 5]
b = s[-1] == xs[-1]
print('b=', b)
```

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

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

```
s = 'hello'
xs = ['h', 'e', 'l', 'l', 'o']
b = s[-2:] == xs[-2:]
print('b=', b)
```

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

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

```
s = 'python␣is␣awesome'
if 'python' in s:
    print('True')
else:
    print('False')
```

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

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

```
s = 'python␣is␣awesome'
if 'Python' in s:
    print('True')
else:
    print('False')
```

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

Note 7. Python strings support a number of methods that lists do not support. It is important to remember that strings are *immutable*, and so methods will never change the content of a string.

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

```
s = 'python␣is␣awesome'
t = s.replace('python', 'everything')
print('t=', t)
```

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

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

```
s = 'Python␣is␣awesome'
s.replace('python', 'everything')
print('s=', s)
```

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

Problem 10. What is the output of the following python code?

```
s = 'python␣is␣awesome'
t = s.split()
u = t[-1]
print('u=', u)
```

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

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

```
s = 'python\nis\tawesome'
t = s.split()
u = '␣'.join(t)
print('u=', u)
```

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

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

```
s = 'python␣␣is\tawesome'
t = s.split('␣')
u = t[1]
print('u=', u)
```

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

Problem 13. What is the output of the following python code?

```
s = 'python␣is␣awesome'
t = s.split('o')
u = 'XXX'.join(t)
print('u=', u)
```

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

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

```
s = 'guido␣van␣rossum'
i = s.find('␣')
t = s[:i]
print('t=',t)
```

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

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

```
s = 'guido␣van␣rossum'
i = s.find('G')
t = s[:i]
print('t=',t)
```

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

Note 16. Strings are represented internally as binary numbers (i.e. 1s and 0s). Special conversion tables are used to map these binary numbers into semantically meaningful strings. The process of going from strings to numbers is called *encoding* and the process of going from numbers to strings is called *decoding*. You are responsible for understanding:

1. ASCII encoding/decoding,
2. the difference between *alphabetical* ordering and *ASCIIbetical* ordering, and
3. basic binary/octal/hexadecimal math.

Problem 17. What is the output of the following python code?

```
b = 'G' > 'a'
print('b=', b)
```

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

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

```
s = 'Guido␣van␣Rossum'
xs = s.split()
xs.sort()
print('xs=', xs)
```

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

Problem 19. What is the output of the following python code?

```
s = 'Guido␣van␣rossum'
xs = s.split()
xs.sort()
print('xs=', xs)
```

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

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

```
print(0b1010)
```

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

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

```
print(0o110)
```

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

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

```
print(0x0010)
```

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

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

```
print(chr(ord('a') - 32))
```

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

Problem 24. What is the output of the following python code?

```
print(chr(ord('f') - 3))
```

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

Note 25. Escape codes let us enter hard-to-type characters into strings. The special character \ (backslash) is used to begin an escape code. In python, there are four methods of entering “strings” that handle escape codes differently:

1. normal strings `'...'`
2. r-strings `r'...'`
3. f-strings `f'...'`
4. bytes `b'...'`

In the problems below, I will only write normal strings for brevity. But you should be able to solve the problems for any type of string.

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

```
 s = '\x48\x45\x4C\x4C\x4F'
 print('s=', s)
```

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

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

```
 name = 'world'
 s = 'hello␣{name}!'
 print('s=', s)
```

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

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

```
 b = "\""␣>␣'\n'
␣print('b=',␣b)
```

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

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

```
 s = '\x57o\x72L\x44'
 print('s=', s)
```

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

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

```python
x = '"'>"'"
print('x=', x)
```

Fraction of LLMs with correct answer: 4 / 13 = 0.31

Problem 31. What is the output of the following python code?

```python
x = '">"'
print('x=', x)
```

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

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

```python
xs = ['there,',"isn't","[a','syntax]",']error']
print(xs[2])
```

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

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

```python
xs = ['there,',"isn't","[a','syntax]",']error']
print(xs[3])
```

Fraction of LLMs with correct answer: 3 / 13 = 0.23

2 Manipulating Markdown

Note 34. The following problems are designed to get you practice for you markdown compiler assignment. They contain a combination of correct and incorrect implementations for functions that are needed for that assignment.
Recall that *reading* is generally easier than *writing*, and so I strongly recommend that you work through these functions before beginning the coding of your markdown compiler assignment.

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

```
def compile_italic_star(line):
    result = ''
    i = 0
    while i < len(line):
        if line[i] == '*':
            if i + 1 < len(line) and '*' in line[i+1:]:
                end = line.find('*', i+1)
                result += '<i>' + line[i+1:end] + '</i>'
                i = end + 1
            else:
                result += '*'
                i += 1
        else:
            result += line[i]
            i += 1
    return result
result = compile_italic_star('alpha␣*beta*␣gamma␣*delta')
print(result)
```

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

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

```
def compile_italic_star(line):
    result = ''
    i = 0
    while i < len(line):
        if line[i] == '*':
            end = line.find('*', i+1)
            if end != -1:
                result += '<i>' + line[i+1:end] + '</i>'
                i = end + 1
            else:
                i = len(line)
        else:
            result += line[i]
            i += 1
    return result
result = compile_italic_star('alpha␣*beta*␣gamma␣*delta')
print(result)
```

Fraction of LLMs with correct answer: 3 / 13 = 0.23

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

```
def compile_italic_star(line):
    result = ''
    i = 0
    while i < len(line):
        if line[i] == '*':
            end = line.find('*', i+1)
            if end != -1:
                result += '<i>' + line[i+1:end] + '</i>'
                i = end + 1
            else:
                i = len(line)
        else:
            result += line[i]
            i += 1
    return result
result = compile_italic_star('alpha␣*beta*␣gamma␣*delta*')
print(result)
```

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

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

```python
def compile_italic_star(line):
    result = ''
    i = 0
    while i < len(line):
        if line[i] == '*':
            end = line.find('*', i+1)
            if end != -1:
                result += '<i>' + line[i+1:end] + '</i>'
                i = end + 1
            else:
                i = len(line)
        else:
            result += line[i]
            i += 1
    return result
result = compile_italic_star('alpha␣*beta␣gamma␣delta')
print(result)
```

Fraction of LLMs with correct answer: 4 / 13 = 0.31

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

```python
def compile_italic_star(line):
    result = ''
    i = 0
    while i < len(line):
        if line[i] == '*':
            end = line.find('*', i+1)
            if end != -1:
                result += '<i>' + line[i+1:end] + '</i>'
                i = end + 1
            else:
                i += 1
        else:
            result += line[i]
            i += 1
    return result
result = compile_italic_star('alpha␣*beta*␣gamma␣*delta')
print(result)
```

Fraction of LLMs with correct answer: 8 / 13 = 0.62

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

```
def compile_italic_star(line):
    result = ''
    i = 0
    while i < len(line):
        if line[i] == '*':
            end = line.find('*', i+1)
            if end != -1:
                result += '<i>' + line[i+1:end] + '</i>'
                i = end + 1
            else:
                i += 1
        else:
            result += line[i]
            i += 1
    return result
result = compile_italic_star('alpha␣*beta␣gamma␣delta')
print(result)
```

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

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

```
def compile_italic_star(line):
    result = ''
    i = 0
    while i < len(line):
        if line[i] == '*':
            end = line.find('*', i+1)
            if end != -1:
                result += '<i>' + line[i+1:end] + '</i>'
                i = end + 1
            else:
                i += 1
        else:
            result += line[i]
            i += 1
    return result
result = compile_italic_star('alpha␣*beta␣gamma␣delta*')
print(result)
```

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

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

```python
def compile_bold_stars(line):
    start = line.find('**')
    if start == -1 or len(line) < 4:
        return line
    end = line[start + 2:].find('**')
    if end == -1:
        return line
    end = end + start + 2
    return line[:start] + '<b>' + line[start + 2:end] + '</b>' + line[end + 2:]
result = compile_bold_stars('alpha␣**beta**␣gamma␣**delta**')
print(result)
```

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

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

```python
def compile_bold_stars(line):
    start = line.find('**')
    if start == -1 or len(line) < 4:
        return line
    end = line[start + 2:].find('**')
    if end == -1:
        return line
    end = end + start + 2
    return line[:start] + '<b>' + line[start + 2:end] + '</b>' + line[end + 2:]
result = compile_bold_stars('alpha␣**beta**␣gamma␣**delta')
print(result)
```

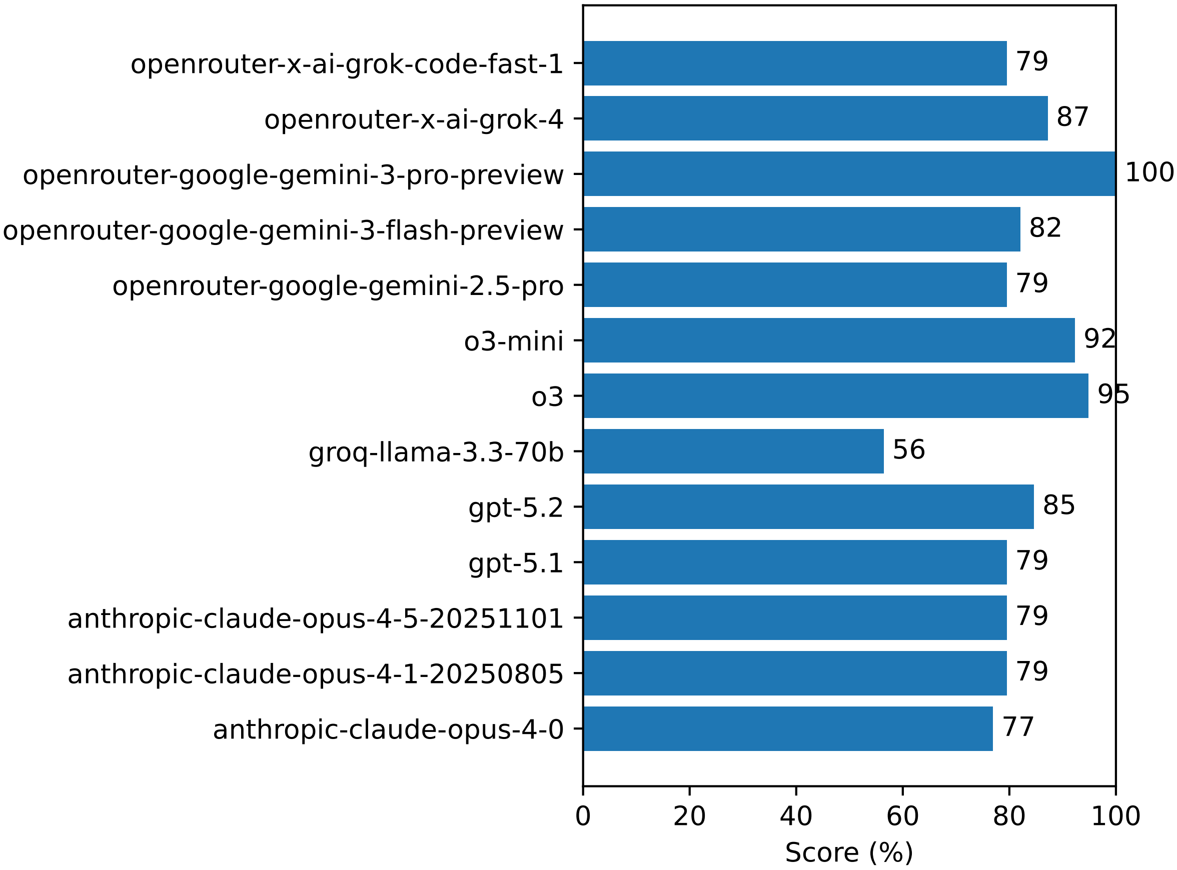
Fraction of LLMs with correct answer: 12 / 13 = 0.92

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

```python
def compile_bold_stars(line):
    start = line.find('**')
    if start == -1 or len(line) < 4:
        return line
    end = line[start + 2:].find('**')
    if end == -1:
        return line
    end = end + start + 2
    return line[:start] + '<b>' + line[start + 2:end] + '</b>' + line[end + 2:]
result = compile_bold_stars('alpha␣beta␣gamma␣**delta')
print(result)
```

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

LLM Model Performance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openrouter-x-ai-grok-4
openrouter-google-gemini-3-pro-preview
openrouter-google-gemini-3-flash-preview
openrouter-google-gemini-2.5-pro
o3-mini
o3
groq-llama-3.3-70b
gpt-5.2
gpt-5.1
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anthropic-claude-opus-4-0
Score (%)