

THEORY QUESTIONS ASSIGNMENT

Python based theory

To be completed at student's own pace and submitted before given deadline

| NO | TASK | POINTS |
|---------------|--------------------|------------|
| PYTHON | | |
| 1 | Theory questions | 30 |
| 2 | String methods | 29 |
| 3 | List methods | 11 |
| 4 | Dictionary methods | 11 |
| 5 | Tuple methods | 2 |
| 6 | Set methods | 12 |
| 7 | File methods | 5 |
| TOTAL | | 100 |

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| 1. Python theory questions | 30 points |
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1. What is Python and what are its main features?
2. Discuss the difference between Python 2 and Python 3
3. What is PEP 8?
4. In computing / computer science what is a program?
5. In computing / computer science what is a process?
6. In computing / computer science what is cache?
7. In computing / computer science what is a thread and what do we mean by multithreading?
8. In computing / computer science what is concurrency and parallelism and what are the differences?
9. What is GIL in Python and how does it work?
10. What do these software development principles mean: DRY, KISS, BDUF
11. What is a Garbage Collector in Python and how does it work?
12. How is memory managed in Python?
13. What is a Python module?
14. What is docstring in Python?
15. What is pickling and unpickling in Python? Example usage.
16. What are the tools that help to find bugs or perform static analysis?
17. How are arguments passed in Python by value or by reference? Give an example.

18. What are Dictionary and List comprehensions in Python? Provide examples.
19. What is namespace in Python?
20. What is pass in Python?
21. What is unit test in Python?
22. In Python what is slicing?
23. What is a negative index in Python?
24. How can the ternary operators be used in python? Give an example.
25. What does this mean: *args, **kwargs? And why would we use it?
26. How are range and xrange different from one another?
27. What is Flask and what can we use it for?
28. What are clustered and non-clustered index in a relational database?
29. What is a 'deadlock' a relational database?
30. What is a 'livelock' a relational database?

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| 2. Python string methods: describe each method and provide an example | 29 points |
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| METHOD | DESCRIPTION | EXAMPLE |
|---------------------|-------------|---------|
| capitalize() | | |
| casefold() | | |
| center() | | |
| count() | | |
| endswith() | | |
| find() | | |
| format() | | |
| index() | | |
| isalnum() | | |

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| isalpha() | | |
| isdigit() | | |
| islower() | | |
| isnumeric() | | |
| isspace() | | |
| istitle() | | |
| isupper() | | |
| join() | | |
| lower() | | |
| lstrip() | | |
| replace() | | |
| rsplit() | | |
| rstrip() | | |
| split() | | |
| splitlines() | | |
| startswith() | | |
| strip() | | |

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| swapcase() | | |
| title() | | |
| upper() | | |

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| 3. Python list methods: describe each method and provide an example | 11 points |
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| Method | Description | Example |
|-----------------|-------------|---------|
| append() | | |
| clear() | | |
| copy() | | |
| count() | | |
| extend() | | |
| index() | | |
| insert() | | |
| pop() | | |
| remove() | | |

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| <code>reverse()</code> | | |
| <code>sort()</code> | | |

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| 4. Python tuple methods: describe each method and provide an example | 2 points |
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| Method | Description | Example |
|----------------------|-------------|---------|
| <code>count()</code> | | |
| <code>index()</code> | | |

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| 5. Python dictionary methods: describe each method and provide an example | 11 points |
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| Method | Description | Example |
|-------------------------|-------------|---------|
| <code>clear()</code> | | |
| <code>copy()</code> | | |
| <code>fromkeys()</code> | | |
| <code>get()</code> | | |
| <code>items()</code> | | |

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| keys() | | |
| pop() | | |
| popitem() | | |
| setdefault() | | |
| update() | | |
| values() | | |

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| 6. Python set methods: describe each method and provide an example | 12 points |
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| Method | Description | Example |
|----------------|-------------|---------|
| add() | | |
| clear() | | |
| copy() | | |
| difference() | | |
| intersection() | | |
| issubset() | | |
| issuperset() | | |
| pop() | | |

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| <code>remove()</code> | | |
| <code>symmetric_difference()</code> | | |
| <code>union()</code> | | |
| <code>update()</code> | | |

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| 7. Python file methods: describe each method and provide an example | 5 points |
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| Method | Description | Example |
|---------------------------|-------------|---------|
| <code>read()</code> | | |
| <code>readline()</code> | | |
| <code>readlines()</code> | | |
| <code>write()</code> | | |
| <code>writelines()</code> | | |