CSSE1001/7030题库

If you have any questions, please add my WeChat:

Apocalypse

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扫一扫上面的二维码图案，加我为朋友。

Operations 运算

(2015s2 Q1) 1. What does the expression 5.0 - 7/2 evaluate to?

(a) 2.0

(b) 1.5

(c) -1

(d) Error

(2016s1 Q1) 2. What does the expression 2.0 + 11//2 evaluate to?

(a) 6.5

(b) 7.0

(c) 7.5

(d) 7

(e) Error

(2016s2 Q1) 3. What does the expression 3.0 + 5%3 evaluate to?

(a) 8.5

(b) 4.0

(c) 5.0

(d) 128

(e) None of the above

(2017s1 Q1) 4. What does the expression (6.0 + 11) / 2 evaluate to?

a) 8

b) 8.0

c) 8.5

d) Error

(2017s1 Q2) 5. What does the expression 4 + 3 % 2 evaluate to?

a) 1

b) 4

c) 4.5

d) 5

(2017s1 Q13) 6. For the following function:

Python

```python
def logic(x, y, z) :
    return x and y or z
```

What is returned by logic(False, False, True) ?

a) True

b) False

c) 1

d) 0

(2017s2 Q1) 7. What does the expression 4.0 + 9//2 evaluate to?

(a) 8.5

(b) 5.0

(c) 8.0

(d) 85.0

(e) None of the above

(2018s1 Q1) 8. What does the expression (4.4 + 6.6) // 2 evaluate to?

a) 5

b) 5.0

c) 5.5

d) Error

(2018s1 Q2) 9. What does the expression 4 + 5 / 2 evaluate to?

a) 4

b) 6

c) 4.5

d) 6.5

e) Error

(2018s1 Q3) 10. What does the expression (2.03) % 3 evaluate to?**

a) 0

b) 2

c) 0.0

d) 2.0

e) Error

(2018s1 Q6) 11. What is the result of 1 < 2 and not 2 > 3?

a) 2

b) True

c) False

d) Error

(2018s2 Q1) 12. What does the expression (7.1 + 3.3) // 4 evaluate to?

a) 2

b) 2.0

c) 2.6

d) Error

(2018s2 Q2) 13. What does the expression 8 - 3 / 2 evaluate to?

a) 6.5

b) 6

c) 2.5

d) 2

e) Error

(2018s2 Q3) 14. What does the expression 32 % 4 evaluate to?**

a) 0

b) 1

c) 2

d) 2.25

e) Error

(2018s2 Q6) 15. What is the result of 1 < 2 and not 5 != 4 ?

a) 0

b) True

c) False

d) Error

(2019s1 Q1) 16. What does the expression 4 + 7 // 2 evaluate to?

a) 5

b) 5.5

c) 7

d) 7.5

e) Error

(2019s1 Q4) 17. What does the expression (0 < 2 < 4 and not 3 > 0 > 1) evaluate to?

a) 0

b) 4

c) True

d) False

e) Error

(2019s2 Q1) 18. What does the expression (12.4 - 5.4) % 3 evaluate to?

a) 1

b) 1.0

c) 2.3333

d) Error

(2019s2 Q2) 19. What does the expression 3 + 7 // 4 evaluate to?

a) 2.5

b) 4

c) 4.75

d) Error

(2019s2 Q3) 20. What does the expression 11.0 % 3 ** 2 evaluate to?

a) 4

b) 2

c) 4.0

d) 2.0

e) Error

(2019s2 Q6) 21. What is the result of not 4 > 2 and 2 < 3?

a) 2

b) True

c) False

d) Error

(2020s1 Q2) 22. What does the expression (6.1 + 3.2) // 3 evaluate to?

a) 3

b) 3.0

c) 3.1

d) Error

(2020s1 Q3) 23. What does the expression c evaluate to?

a) 4

b) 4.0

c) 5.5

d) 0

e) Error

(2020s1 Q4) 24. What does the expression 11.0 % 3 ** 2 evaluate to?

a) 4

b) Error

c) 2.0

d) 4

e) 2

(2020s2 Q1) 1. What does the expression 5.1 + 12.2 // 2 evaluate to?

(a) 11

(b) 11.0

(c) 11.1

(d) Error

(2020s2 Q2) 2. What does the expression 5.0 - 3 % 2 evaluate to?

(a) 4

(b) 4.0

(c) 0

(d) -4

(e) Error

(2020s2 Q3) 3. What does the expression 5.0 / 2 % 2 evaluate to?

(a) 0.5

(b) 2.0

(c) 2

(d) Error

(e) None of the other choices are correct

(2021s1 Q1) 1. What does the expression 6.0 + 11 / 2 evaluate to?

a) 11.5

b) 11.0

c) 11

d) 8.5

(2021s1 Q2) 2. What does the expression 0 > -1 < -2 evaluate to?

a) True

b) False

c) Error

(2021s1 Q3) 3. What does the expression 0 < -1 or -4 < -2 evaluate to?

a) True

b) False

c) Error

(2021s1 Q4) 4. What does the expression 0 < 10 and not (4 < 2) evaluate to?

a) True

b) False

c) Error

(2017s1 Q4) 25. What is the result of 'a' < 'b'?

a) 'a'

b) True

c) False

d) Error

(2015s1 Q2) 26. What does the expression 2 * [’1’,’3’] evaluate to?

(a) [2, 6]

(b) [’2’,’6’]

(c) [’1’,’1’,’3’,’3’]

(d) [’1’,’3’,’1’,’3’]

(e) Error

(2015s1 Q3) 27. What does the expression ’2’ + [’1’,’3’] evaluate to?

(a) [3, 5]

(b) [’3’,’5’]

(c) [’21’,’23’]

(d) [’ 2’ ,’ 1’ ,’ 3’]

(e) Error

(2015s1 Q4) 28. What does the expression list(’ 2’) + [’ 1’ ,’ 3’] evaluate to?

(a) [3, 5]

(b) [’ 3’ ,’ 5’]

(c) [’ 21’ ,’ 23’]

(d) [’ 2’ ,’ 1’ ,’ 3’]

(e) Error

(2015s2 Q2) 29. What does the expression list(’ a’) + [’ d’ ,’ e’] evaluate to?

(a) [’ ad’ ,’ ae’]

(b) [’ a’ ,’ d’ ,’ e’]

(c) [’ a’ ,[’ d’ ,’ e’]]

(d) [[’ a’],’ d’ ,’ e’]

(e) Error

(2015s2 Q3) 30. What does the expression ’ 2’ * [‘4’ , ‘6’] evaluate to?

(a) [8, 12]

(b) [’ 8’ ,’ 12’]

(c) [’ 4’ ,’ 4’ ,’ 6’ ,’ 6’]

(d) [’ 4’ ,’ 6’ ,’ 4’ ,’ 6’]

(e) Error

(2015s2 Q4) 31. What does the expression ’ 54’ + ’ 28’ evaluate to?

(a) [’ 54’ , ’ 28’]

(b) 82

(c) ’ 5428’

(d) [’ 5428’]

(e) Error

(2015s2 Q5) 32. What does the expression [’ 8’ , ’ 5’] + [7] evaluate to?

(a) [15, 12]

(b) [’ 8’ , ’ 5’ , 7]

(c) [8, 5, 7]

(d) [‘8’ 7, ‘5’ 7]

(e) Error

(2016s1 Q2) 33. What does the expression 2 * [’ 1’ , ’ 3’] evaluate to?

(a) [2, 6]

(b) [’ 2’ , ’ 6’]

(c) [’ 1’ , ’ 1’ , ’ 3’ , ’ 3’]

(d) [’ 1’ , ’ 3’ , ’ 1’ , ’ 3’]

(e) Error

(2016s1 Q3) 34. What does the expression ’ 2’ + [’ 1’ , ’ 3’] evaluate to?

(a) [3, 5]

(b) [’ 3’ , ’ 5’]

(c) [’ 21’ ,’ 23’]

(d) [’ 2’ ,’ 1’ ,’ 3’]

(e) Error

(2016s1 Q4) 35. What does the expression list(’ 2’) + [’ 1’ ,’ 3’] evaluate to?

(a) [3, 5]

(b) [’ 3’ ,’ 5’]

(c) [’ 21’ ,’ 23’]

(d) [’ 2’ ,’ 1’ ,’ 3’]

(e) Error

(2017s1 Q3) 36. What does the expression (1, 2) + (3, 4) evaluate to?

a) (1, 2, 3, 4)

b) (4, 6)

c) (4, 5, 5, 6)

d) Error

(2017s2 Q5) 37. What does the expression (5,4) + ((3)) evaluate to?

(a) (5, 4, 3)

(b) (5, 4, (3))

(c) (8, 7)

(d) (9, 3)

(e) Error

(2018s1 Q4) 38. What does the expression 1, + 2, + 3, evaluate to?

a) 6

b) (6,)

c) (1, 2, 3)

d) Error

(2018s1 Q5) 39. What does the expression ('a', 'c') + ('b', 'd') evaluate to?

a) ('a', 'c', 'b', 'd')

b) ('a', 'b', 'c', 'd')

c) ('ab', 'cd')

d) 'acbd'

e) Error

(2018s2 Q4) 40. What does the expression 4*'fox'/4 evaluate to?

a) 'fox'

b) 'foxfoxfoxfox'

c) 'foxfoxfoxfox/4'

d) Error

(2018s1 Q11) 41. Given the following code:

Python

```python
x = input("Please enter the first number: ")
y = input("Please enter the second number: ")
print ("x + y =", x + y)
```

and assuming that the user inputs 2 and 5 respectively. What would be the output?

a) x + y = x + y

b) x + y = 25

c) x + y = 7

d) Error

(2018s2 Q11) 42. Given the following code:

Python

```python
x = input("Please enter a number: ")
y = input("Please enter a second number: ")
print ("x / y =", x / y)
```

and assuming that the user inputs 10 and 4 respectively, what would be the output?

a) x / y = 2

b) x / y = 2.5

c) x / y = 0.5

d) Error

(2018s2 Q5) 43. What does the expression list(('a', 'c') + (1,2,)) evaluate to?

a) ('a', 'c', 1, 2)

b) ('a', 'c', 1, 2,)

c) ['a', 'c', 1, 2]

d) ['a', 'c', 1, 2,]

e) Error

(2018s2 Q7) 44. What is the value of y after the following statements are evaluated?

Python

```python
x = [1, 2, 3, [4, 5, 6]]
y = x[3, 2]
```

a) 5

b) 6

c) 3

d) [4, 5]

e) Error

(2019s1 Q2) 45. What does the expression [1, 2] + [2, 3] evaluate to?

a) [1, 2, 2, 3]

b) [1, 2, 3]

c) [3, 5]

d) Error

(2019s1 Q3) 46. What does the expression (1, 'a') + (2, 'b') evaluate to?

a) {1: 'a', 2: 'b'}

b) (1, 'a', 2, 'b')

c) (3, 'ab')

d) [(1, 'a'), (2, 'b')]

e) Error

(2019s2 Q12) 47. Given the following code:

Python

```python
x = input("Please enter the first number: ")
y = input("Please enter the second number: ")
print ("x - y =", x - y)
```

and assuming that the user inputs 7 and 3 respectively. What would be the output?

a) x - y = x - y

b) x - y = 7 - 3

c) x - y = 4

d) Error

(2019s2 Q4) 48. What does the expression (2,3) + (4) evaluate to?

a) (2,3,4)

b) (2,3)

c) (6,7)

d) Error

(2019s2 Q5) 49. What does the expression ['g', 'y'] < ['b', 'd'] evaluate to?

a) True

b) False

c) ''

d) Error

(2019s2 Q7) 50. What will be printed out when the following loop is executed? (Note that \n corresponds to a new line)

Python

```python
for a,b in [(3,4),(6,7)]:
    print (a,b)
```

a) (3,4) 0\n(6,7) 1

b) 3 0 4 1 6 2 7 3

c) 3 4\n6 7

d) None of the above

(2019s2 Q11) 51. What is the value of y after the following statements are evaluated?

Python

```python
x = [2,[3,5,8],7]
y = x[1,2]
```

a) 5

b) 8

c) 7

d) Error

(2020s1 Q5) 4. What will be returned when (7,3,(6,)) + (9,(5)) is entered into Python?

(a) (7, 3, 6, 9, 5)

(b) (7, 3, (6,), 9, (5))

(c) (7, 3, (6,), (9, (5)))

(d) (7, 3, (6,), 9, 5)

(e) None of the other choices are correct

(2020s1 Q6) 5. What does the expression ['ab'] <= ['ba'] evaluate to?

(a) Error

(b) 'ba'

(c) 'ab'

(d) False

(e) True

(2020s1 Q7) 6. What is the value of a after the following statements are evaluated?

Python

```python
x = [1, 'a', '\t bc'.strip()]
y = ['d', 'g', 'f']
z=x+ y
a = z[2]
```

(a) '\tbc'

(b) 'bc'

(c) Error

(d) '\t bcf'

(e) '\tbc'

(2020s1 Q8) 7. What is the result of max(2,4) < min(5,[6,3][1]) ?

(a) True

(b) False

(c) Error

(d) None of the other choices are correct

(2020s2 Q4) 4. What does the expression (2,9) + ([7]) evaluate to?

(a) (2,9,[7])

(b) (2,9,([7]))

(c) (2,9,7)

(d) Error

(e) None of the other choices are correct

(2020s2 Q5) 5. What does the expression ['grue'] <= ['cat'] evaluate to?

(a) True

(b) False

(c) ['grue']

(d) Error

(e) None of the other choices are correct

(2020s2 Q6) 6. What is the value of a after the following statements are evaluated?

Python

```python
x = [3, '7', '\n d r'.split()]
a = x[2][2]
```

(a) 'd'

(b) 'r'

(c) 'd r'

(d) Error

(e) None of the other choices are correct

(2020s2 Q7) 7. What is the result of max(1.2,4//3) < min(7-23,1.1)?**

(a) True

(b) False

(c) Error

(d) None of the other choices are correct

(2021s1 Q5) 5. What does the expression (1, 2) + (2,) evaluate to?

a) (1, 2)

b) (3, 2)

c) (1, 2, 2)

d) [(1, 2), (2,)]

e) Error

(2021s1 Q6) 6. What does the expression [1, 2] + [1, 2, 3] evaluate to?

a) [1, 2, 3]

b) [2, 4, 3]

c) [1, 1, 2, 2, 3]

d) [1, 2, 1, 2, 3]

e) Error

(2021s1 Q10) 10. What is the consequence of executing the following statements?

```Python
x = (1, 2)
x += (3, 4)
```

a) Tuples are immutable, the += operator will cause an error.

b) The second statement will add the values 3 and 4 to the tuple stored in x.

c) Tuples are immutable, the second statement will assign the tuple (3, 4) to x.

d) The second statement will create a new tuple that contains the contents of x and the tuple to the right of the += operator. This new tuple is assigned to x.

列表特性

(2017s1 Q5) 55. What is the value of x after the following is evaluated?

x = [3,2,1]

y = x

y[1] = 5

a) [ ]

b) [3, 5, 1]

c) [5, 2, 1]

d) [3, 2, 1]

(2018s2 Q8) 56. What is the value of y after the following statements are evaluated?

v = (['a', 'b'],['c', 'd'])

x,y = v

z = y

z[-1] = 3

a) 0

b) ['c',3]

c) ['a', 'b']

d) ['a', 'b', 'c', 3]

e) Error

(2018s1 Q7) 57. What is the value of a after the following statements are evaluated?

x = [1, 2, 3]

y = [4, 5, 6]

z = x + y

a = z[4]

a) 4

b) 5

c) [4]

d) [5]

e) Error

(2018s1 Q8) 58. What is the value of x after the following statements are evaluated?

```
x = ['a', 'b', 'c']
y = x
y[1] = 0
```

a) 0

b) ['a']

c) ['a', 0, 'c']

d) ['a', 'b', 'c']

e) Error

(2019s1 Q7) 59. What is the value of a after the following statements are evaluated?

```
x = ['x', 'y', 'z']
y = ['z', 'y', 'x']
z = x + y
a = z[1]
```

a) 'x'

b) 'y'

c) ['x', 'y', 'z']

d) ['z', 'y', 'x']

e) Error

(2019s1 Q8) 60. What is the value of x after the following statements are evaluated?

```
x = [-1, 1.5, 'a']
y = x
y[2] = 0
```

a) [-1, 1.5, 0]

b) [-1, 0, 'a']

c) -1

d) 0

e) Error

(2019s2 Q8) 62. What is the value of x after the following statements are evaluated?

```
x = ['a', 'b', 'c']
y = x
y[1] = 0
x[0] = 1
```

a) 0

b) ['a']

c) [1, 0, 'c']

d) [1, 'b', 'c']

e) Error

(2020s1 Q9) 8. What is the value of x after the following statements are evaluated?

```
x = [23, True, False]
y = x
y[2] = 46
x[1] = 7
```

(a) [23, 7, False]

(b) [23, 7, 46]

(c) Error

(d) None of the other choices

(2020s2 Q8) 8. What is the value of a after the following statements are evaluated?

```
x = ['a', (3,4), {1:'b'}]
y= x
y[2] = {2:'c'}
a = x[2][1]
```

(a) 'b'

(b) 'c'

(c) Error

(d) None of the other choices are correct

切片

(2015s1 Q5) 57. After the assignment x =’Very Naughty Boy’, which of the following assigns’N’ to the variable y?

(a) y = x[-10]

(b) y = x[-12]

(c) y = x[5]

(d) y = x[6]

(e) More than one of the above is correct.

(2015s1 Q6) 58. After the assignment x =’Very Naughty Boy’, which of the following assigns’Naug’ to the variable y?

(a) y = x[5:8]

(b) y = x[5:9]

(c) y = x[6:9]

(d) y = x[6:10]

(e) More than one of the above is correct.

(2015s1 Q7) 59. After the assignment x =’ Very Naughty Boy’ , which of the following assigns’ hty’ to the variable y?

(a) y = x[-8:-5]

(b) y = x[-8:-4]

(c) y = x[-7:-5]

(d) y = x[-7:-4]

(e) More than one of the above is correct.

(2015s1 Q8) 60. After the assignment x =’ Very Naughty Boy’ , which of the following assigns’ B y’ to the variable y?

(a) y = x[-4:-5:-1]

(b) y = x[-4:-6:-1]

(c) y = x[-3:-5:-1]

(d) y = x[-3:-6:-1]

(e) More than one of the above is correct.

(2016s1 Q5) 61. After the assignment x =’ Very Naughty Boy’ , which of the following assigns’ N’ to the variable y?

(a) y = x[-10]

(b) y = x[-11]

(c) y = x[-12]

(d) y = x[6]

(e) More than one of the above is correct.

(2016s1 Q6) 62. After the assignment x = ’ Very Naughty Boy’ , which of the following assigns ’ augh’ to the variable y?

(a) y = x[5:8]

(b) y = x[5:9]

(c) y = x[6:9]

(d) y = x[6:10]

(e) None of the above are correct.

(2016s1 Q7) 63. After the assignment x = ’ Very Naughty Boy’ , which of the following assigns ’ ght’ to the variable y?

(a) y = x[-8:-5]

(b) y = x[-8:-4]

(c) y = x[-7:-5]

(d) y = x[-7:-4]

(e) None of the above are correct.

(2016s1 Q8) 64. After the assignment x = ’ Very Naughty Boy’ , which of the following assigns ’ uaN’ to the variable y?

(a) y = x[-9:-12:-1]

(b) y = x[4:6:-1]

(c) y = x[6:4:-1]

(d) y = x[4:6:1]

(e) More than one of the above is correct.

(2015s2 Q6) 65. After the assignment x =’ Quick brown fox’ , which of the following assigns’ w’ to the variable y?

(a) y = x[10]

(b) y = x[11]

(c) y = x[-6]

(d) y = x[-7]

(e) More than one of the above is correct.

(2015s2 Q7) 66. After the assignment x =’ Quick brown fox’ , which of the following assigns’ fox’ to the variable y?

(a) y = x[12 : 14]

(b) y = x[13 : 15]

(c) y = x[13 : 16]

(d) y = x[12 : 15]

(e) More than one of the above is correct.

(2015s2 Q8) 67. After the assignment x =’ Quick brown fox’ , which of the following assigns’ fox’ to the variable y?

(a) y = x[-3 :]

(b) y = x[-3 : -1]

(c) y = x[-4 :]

(d) y = x[-4 : -1]

(e) More than one of the above is correct.

(2015s2 Q9) 68. After the assignment x =’ Quick brown fox’ , which of the following assigns’ nwo’ to the variable y?

(a) y = x[-5 : -8 : -1]

(b) y = x[-6 : -9 : -1]

(c) y = x[-5: -8: 1]

(d) y = x[-6:-9:1]

(e) More than one of the above is correct.

(2016s2 Q6) 69. After the assignment x = ’ Sample text’ , which of the following assigns ’ l’ to the variable y?

(a) y = x[5]

(b) y = x[4:5]

(c) y = x[-6]

(d) y = x[6]

(e) More than one of the above is correct.

(2016s2 Q7) 70. After the assignment x = ’ Sample text’ , which of the following assigns ’ text’ to the variable y?

(a) y = x[8 : 11]

(b) y = x[7 : 11]

(c) y = x[8 :]

(d) y = x[7 :]

(e) More than one of the above is correct.

(2016s2 Q8) 71. After the assignment x = ’ Sample text’ , which of the following assigns ’ ple’ to the variable y?

(a) y = x[-8 : -5]

(b) y = x[-8 : -6]

(c) y = x[-7 : -4]

(d) y = x[-7 : -5]

(e) More than one of the above is correct.

(2016s2 Q9) 72. After the assignment x = ’ Sample text’ , which of the following assigns ’ pet’ to the variable y?

(a) y = x[-8 : -4 : 2]

(b) y = x[-8 : -3 : 2]

(c) y = x[-7: -4 : 2]

(d) y = x[-7: -3 : 2]

(e) More than one of the above is correct.

(2017s2 Q6) 73. After the assignment x = ’ Dogs and cats’ , which of the following assigns ’ n’ to the variable y?

(a) y = x[6]

(b) y = x[7]

(c) y = x[-8]

(d) y = x[7:8]

(e) More than one of the above is correct.

(2017s2 Q7) 74. After the assignment x = ’ Dogs and cats’ , which of the following assigns ’ and’ to the variable y?

(a) y = x[6 : 8]

(b) y = x[6: 9]

(c) y = x[-8:-5]

(d) y = x[-8:-6]

(e) None of the above.

(2017s2 Q8) 75. After the assignment x = ’ Critical mass’ , which of the following assigns ’ cit’ to the variable y?

(a) y = x[5 : 2: -1]

(b) y = x[-8 : -11]

(c) y = x[-8 : -11: -1]

(d) y = x[5 : 2]

(e) More than one of the above is correct.

(2017s2 Q9) 76. After the assignment x = ’ Critical mass’ , which of the following assigns ’ tam ’ to the variable y?

(a) y = x[3 : 10 : 3]

(b) y = x[3 : 3 : 10]

(c) y = x[4: 10 : 3]

(d) y = x[4: 3 : 9]

(e) More than one of the above is correct.

(2018s2 Q9) 77. After the assignment x = 'Just in time', which of the following statements assigns 'st' to y?

a) y = x[3:5]

b) y = x[2:4]

c) y = x[-7:-9]

d) y = x[-10:-8]

e) More than one of the above is correct.

(2018s2 Q10) 78. What does the following expression evaluate to?

('abcdef' + 'ghi')[2 : 6 : 2]

a) 'bd'

b) 'ce'

c) 'bdf'

d) 'ceg'

e) None of the above

(2018s1 Q9) 79. After the assignment s1 = "Monty Python", which of the following statements assigns 'Py' to s2?

a) s2 = s1[6:2]

b) s2 = s1[-6:-2]

c) s2 = s1[6:7]

d) s2 = s1[6:8]

e) More than one of the above is correct.

(2018s1 Q10) 80. What does the following expression evaluate to?

('abc' + 'def' + 'ghi')[2]

a) 'c'

b) 'b'

c) 'ghi'

d) 'def'

e) Error

(2019s1 Q5) 81. After the assignment s1 = "Programming" + " is " + "Fun", which of the following statements assigns "is" to s2?

a) s2 = s1[1]

b) s2 = s1[-6:-4]

c) s2 = s1[12:13]

d) s2 = s1[12:14]

e) More than one of the above is correct.

(2019s1 Q6) 82. What is the value of s4 after the following statements are evaluated?

s1 = "Hello"

s2 = "World"

s3 = "Ni Hao"

s3 = s1

s3 = "Hi"

s4 = s1 + s2

a) "HiWorld"

b) "HelloWorld"

c) "Ni HaoWorld"

d) Error

(2019s2 Q9) 83. After the assignment s1 = "Silver lining", which of the following statements assigns 'r l' to s2?

a) s2 = s1[5:7]

b) s2 = s1[5:8]

c) s2 = s1[-8:-6]

d) s2 = s1[-6:-8]

e) More than one of the above is correct.

(2019s2 Q10) 84. After the assignment s1 = "Silver lining", what will the value of s2 be after the following command is entered?

s2=s1[: : -2]

a) 'gii elS'

b) 'ngSilver lini'

c) 'gSilver linin'

d) None of the above

(2020s1 Q10) 9. After the assignment s1 = "Ode to Programming", which of the following statements assigns 'rog' to s2?

(a) s2=s1[8:11]

(b) s2=s1[8:10]

(c) s2 = s1[-7:-10]

(d) s2 = s1[-10:-7]

(e) More than one of the other options are correct

(2020s1 Q11) 10. Given the assignment s1 = "Ode to Programming", what will the value of s2 be after the following command is entered?

```
s2=s1[3:11:4]
```

(a) s2 = 'e '

(b) s2 = ' Pr'

(c) s2 = ' P'

(d) None of the other choices are correct

(2020s2 Q9) 9. After the assignment s1 = "Never give up", which of the following statements assigns 'r g' to s2?

(a) s2 = s1[4:7]

(b) s2 = s1[4:8]

(c) s2 = s1[-9:-7]

(d) s2 = s1[-9:-6]

(e) More than one of the other choices are correct

(2020s2 Q10) 10. After the assignment s1 = "Never give up", what will the value of y be after the following command is entered?

s2=s1[6::-2]

(a) s2 = 'p v'

(b) s2 = 'give '

(c) s2 = 'grvN'

(d) None of the other choices are correct

列表/字符串基本操作

(2019s1 Q9) 61. What is the value of x after the following statements are evaluated?

Python

```python
x = [1, 2, 3]
x.pop(1)
y = x.extend([4, 5, 6])
x.pop(3)
```

a) [1, 2]

b) [5, 6]

c) [2, 4, 5, 6]

d) [1, 3, 4, 6]

e) Error

(2015s1 Q9-10)

63-64. The next 2 questions refer to the following definition.

Python

```python
def g(x, z):
    x.append(z)
return x
```

(2015s1 Q9) 63. What is the value of y after the following is evaluated?

y = [1, 2, 3]

g(y, 4).extend(g(y[:], 4))

(a) [1, 2, 3, 4]

(b) [1, 2, 3, 4, 4]

(c) [1, 2, 3, 4, 1, 2, 3, 4]

(d) [1, 2, 3, 4, 1, 2, 3, 4, 4]

(e) [1, 2, 3, 4, 4, 1, 2, 3, 4, 4]

(2015s1 Q10) 64. What is the value of y after the following is evaluated?

y = [1, 2, 3]

g(y[:], 4).extend(g(y,· 4))

(a) [1, 2, 3, 4]

(b) [1, 2, 3, 4, 4]

(c) [1, 2, 3, 4, 1, 2, 3, 4]

(d) [1, 2, 3, 4, 1, 2, 3, 4, 4]

(e) [1, 2, 3, 4, 4, 1, 2, 3, 4, 4]

(2015s2 Q10-11)

87-88. The next 2 questions refer to the following definition.

Python

```python
def g(p):
      w = p.pop(1)
      p.extend(w)
      return p
```

(2015s2 Q10) 87. What is the value of y after the following is evaluated?

y = [‘d’ ,’ e’ ,’ f’]

g(y[:]).extend(g(y))

(a) [’ e’ ,’ f’ , ‘d’]

(b) [‘d’ ,’ f’ ,’ e’]

(c) [‘e’ ,’ f’ ,’ d’ , ‘e’ ,’ f’ ,’ d’]

(d) [‘d’ ,’ f’ ,’ e’ , ‘f’ ,’ d’ ,’ e’]

(e) Error

(2015s2 Q11) 88. What is the value of y after the following is evaluated?

y = [‘d’ ,’ e’ ,’ f’]

g(y).extend(g(y[:]))

(a) [’ e’ ,’ f’ , ‘d’]

(b) [‘d’ ,’ f’ ,’ e’]

(c) [‘e’ ,’ f’ ,’ d’ , ‘e’ ,’ f’ ,’ d’]

(d) [‘d’ ,’ f’ ,’ e’ , ‘d’ ,’ e’ ,’ f’]

(e) Error

(2016s1 Q9-10)

89-90. The next 2 questions refer to the following definition.

Python

```python
def g(x, z):
    x = x + [z]
return x
```

(2016s1 Q9) 89. What is the value of y after the following is evaluated?

y = [1, 2, 3]

y.extend(g(y, 4))

(a) [1, 2, 3, 4]

(b) [1, 2, 3, 4, 4]

(c) [1, 2, 3, 1, 2, 3, 4]

(d) [1, 2, 3, 4, 1, 2, 3, 4]

(e) [1, 2, 3, 4, 1, 2, 3, 4, 4]

(2016s1 Q10) 90. What is the value of y after the following is evaluated?

y = [1, 2, 3]

y.extend(g(list(y), 4))

(a) [1, 2, 3, 4]

(b) [1, 2, 3, 4, 4]

(c) [1, 2, 3, 1, 2, 3, 4]

(d) [1, 2, 3, 4, 1, 2, 3, 4]

(e) [1, 2, 3, 4, 1, 2, 3, 4, 4]

(2016s2 Q10-11)

91-92. The next 2 questions refer to the following definition.

Python

```python
def g(p):
        w = p.pop(1)
        p.extend(w)
        return p
```

(2016s2 Q10) 91. What is the value of y after the following is evaluated?

y = [‘k’ ,’ l’ ,’ m’]

g(y[:]).extend(g(y))

(a) [’ l’ ,’ m’ , ‘k’]

(b) [‘k’ ,’ m’ ,’ l’]

(c) [‘l’ ,’ m’ ,’ k’ , ‘l’ ,’ m’ ,’ k’]

(d) [‘k’ ,’ m’ ,’ l’ , ‘k’ ,’ m’ ,’ l’]

(e) Error

(2016s2 Q11) 92. What is the value of y after the following is evaluated?

y = [‘k’ ,’ l’ ,’ m’]

g(y).extend(g(y[:]))

(a) [’ l’ ,’ m’ , ‘k’]

(b) [‘k’ ,’ m’ ,’ l’]

(c) [‘l’ ,’ m’ ,’ k’ , ‘l’ ,’ m’ ,’ k’]

(d) [‘k’ ,’ m’ ,’ l’ , ‘k’ ,’ l’ ,’ m’]

(e) Error

(2017s1 Q6) 97. What is the value of z after the following is evaluated?

y = ['a', 'b']

z = ['t']

y.extend(['c'])

z.append(y)

a) ['t', ['a', 'b', 'c']]

b) ['t', 'a', 'b', 'c']

c) ['t', ['c', 'a', 'b']]

d) ['t', 'c', 'a', 'b']

(2017s1 Q7) 98. What will be the value of x after evaluating these statements?

x = [1, 2, 3, 4]

x.append(x.pop(1))

x.insert(2, x.pop(3))

a) [1, 2, 3, 4]

b) [2, 4, 3, 1]

c) [1, 3, 2, 4]

d) [3, 2, 1, 4]

(2017s2 Q10-11)

99-100. The next 2 questions refer to the following definition.

def g(p):

```
    z = p.pop(0)
    p.extend(z)
    return p
```

(2017s2 Q10) 99. What is the value of y after the following is evaluated?

```
y = [ ‘h’ ,’ i’ ,’ j’ ]
g(y[:]).extend(g(y))
```

(a) [’ h’ ,’ i’ , ‘j’]

(b) [‘i’ ,’ j’ ,’ h’]

(c) [‘i’ ,’ j’ ,’ h’ , ‘j’ ,’ h’ ,’ i’]

(d) [‘i’ ,’ j’ ,’ h’ , ‘i’ ,’ j’ ,’ h’]

(e) Error

(2017s2 Q11) 100. What is the value of y after the following is evaluated?

```
y = [ ‘h’ ,’ i’ ,’ j’ ]
g(y).extend(g(y[:]))
```

(a) [’ h’ ,’ i’ , ‘j’]

(b) [‘i’ ,’ j’ ,’ h’]

(c) [‘i’ ,’ j’ ,’ h’ , ‘j’ ,’ h’ ,’ i’]

(d) [‘i’ ,’ j’ ,’ h’ , ‘i’ ,’ j’ ,’ h’]

(e) Error

(2017s2 Q12) 101. What is the value after the following is evaluated?

```
y = [4, 5, 6, 7]
y.insert(3, y.pop(2))
```

(a) [4, 5, 7, 6]

(b) [4, 6, 7, 5]

(c) [4, 5, 6, 7]

(d) [4, 5, 6, 4]

(e) None of the above

(2016s1 Q11) 93. After the assignment x = ’ a\t\tb\tc\td\t\n’ , what does the expression x.strip().split() evaluate to?

(a) [’ a’ ,’ ’ ,’ b’ ,’ c’ ,’ d’ ,’ ’]

(b) [’ a’ ,’ ’ ,’ b’ ,’ c’ ,’ d’ ,’ \n’]

(c) [’ a’ ,’ b’ ,’ c’ ,’ d’]

(d) [’ a’ ,’ b’ ,’ c’ ,’ d’ ,’ ’]

(e) [’ a’ ,’ b’ ,’ c’ ,’ d’ ,’ \n’]

(2016s2 Q12) 94. After the assignment z=’ the big \n dog’ what does the expression sorted(z.split()) evaluate to?

(a) [‘big’ , ‘dog’ ,’ the’]

(b) [‘\n’ , ‘big’ , ‘dog’ , ‘the’]

(c) ‘the big \n dog’

(d) [’ the’ , ‘big’ , ‘dog’]

(e) Error

(2016s2 Q13) 95. After the assignment z=’ the big \n dog’ what does the expression sorted(z.split(sep=’ ‘)) evaluate to?

(a) [‘big’ , ‘dog’ ,’ the’]

(b) [‘\n’ , ‘big’ , ‘dog’ , ‘the’]

(c) ‘the big \n dog’

(d) ‘\n’ , ‘big’ , ‘dog’ , ‘the’

(e) Error

(2015s1 Q11) 96. After the assignment x =’ a,,b,c,d,\n’ , what does the expression x.strip().split(’ ,’) evaluate to?

(a) [’ a’ ,’ ’ ,’ b’ ,’ c’ ,’ d’ ,’ ’]

(b) [’ a’ ,’ ’ ,’ b’ ,’ c’ ,’ d’ ,’ \n’]

(c) [’ a’ ,’ b’ ,’ c’ ,’ d’]

(d) [’ a’ ,’ b’ ,’ c’ ,’ d’ ,’ ’]

(e) [’ a’ ,’ b’ ,’ c’ ,’ d’ ,’ \n’]

(2017s2 Q13) 102. What is the value of v after the following assignments are made?

z=’ roses are red’

v=':'.join(z.split())

(a) [’ roses ’ :’ are ’ :’ red ’]

(b) ‘roses:are:red’

(c) ‘roses’ : ‘are’ : ‘red’

(d) [‘roses:are:red’]

(e) Error

(2018s2 Q13) 103. After the assignment z='one \n life' what does the expression sorted(z.split()) evaluate to?

a) ['\n', 'life', 'one']

b) ['life', 'one', '\n']

c) ['life', 'one']

d) '\n', 'life', 'one'

e) Error

(2019s2 Q16) 104. After the assignment z='two \t \t pairs' what does the expression '\t'.join(z.split('\t')) evaluate to?

a) 'two \t pairs'

b) 'two \t \t pairs'

c) 'two\tpairs'

d) None of the above

(2020s1 Q12) 11. What will be in sum after the following loop has completed executing?

```
sum=''
for e,f in ('ab','cd'):
    sum+=2*e+f
```

(a) ('ababcd')

(b) 'ababcd'

(c) 'aabccd'

(d) Error

(e) None of the other choices are correct

(2020s1 Q13) 12. What will be printed after the following code is executed:

```
x = input("Please enter a two digit number: ")
x1 = int(x)
x1 = x1[0]
```

```
print("The first digit is:", x1)
```

(a) The first digit is: 1

(b) The first digit is: 15

(c) An Error message

(d) The first digit is:

(2020s1 Q37) 36. What is the value of g after the following is evaluated?

```
y = ['a', 'b']
g= [2]
y.extend([4])
g.append(y)
```

(a) [2, ['a', 'b', 4]]

(b) [2, 'a', 'b', [4]]

(c) None

(d) Error

(2020s1 Q38) 37. What will be the value of x after evaluating these statements?

```
x = [1, 2, 3, 4]
x.append(x.pop(2))
x.insert(2, x.pop(1))
```

(a) [1, 2, 3, 4]

(b) [2, 4, 3, 1]

(c) [1, 3, 2, 4]

(d) [1, 4, 2, 3]

(e) None of the other options are correct

(2020s2 Q11) 11. What will be printed out after the following code is executed?

Python

```python
for i,j in (['fr','qt'],):
    j,i=i,j
    print(i,j)
```

(a) fr qt

(b) qt fr

(c) f r

q t

(d) r f

t q

(e) None of the other choices are correct

(2020s2 Q12) 12. Consider the following code:

x = input("Please enter a number: ")

x1 = x[:-1]

print("The number you entered was:", x1)

What will be printed after the above code is executed, assuming that you enter 236 when prompted?

(a) The number you entered was: 236

(b) The number you entered was: 23

(c) The number you entered was: 632

(d) An error message

(2020s2 Q37) 37. Assume y = [3,4,5] and z= [1,2]. What will be popped from y after the following statement is executed?

y.pop(z.extend([1,2])[2])

(a) 4

(b) 5

(c) 3

(d) Nothing. An error message will be produced

(2020s2 Q38) 38. What will be the value of x after evaluating these statements?

x = [4, 5, 6, 7]

x.extend(x)

x.insert(1, x.pop(3))

(a) [4,7,5,6,[4,5,6,7]]

(b) [4, 7, 5, 6, 4, 5, 6, 7]

(c) None

(d) Error

(e) None of the other options is correct

字典基本操作

(2015s1 Q12) 105. What is the value of y after the following is evaluated?

Python

```
d = {’Brisbane’: {2013:24.1, 2014:24.2},’Adelaide’: {2012:22.1, 2013:22.6, 2014:22.8}}
y = d.get(’Brisbane’, {}).get(2012)
```

(a) None

(b) {}

(c) [24.1, 22.8]

(d) {2013:24.1, 2014:24.2}

(e) Error

(2015s1 Q13) 106. What is the value of y after the following is evaluated?

```
d = {’ Brisbane’ : {2013:24.1, 2014:24.2},
’ Adelaide’ : {2012:22.1, 2013:22.6, 2014:22.8}}
y = d.get(’ Adelaide’ , {}).get(2012)
```

(a) None

(b) {}

(c) 22.1

(d) {2012:22.1, 2013:22.6, 2014:22.8}

(e) Error

(2015s2 Q15) 107. What is the value of y after the following is evaluated?

```
d = {0:’ Zero’ , 1:’ One’ , 4:’ Four’ , 5:’ Unknown’ }
d[3] = ’ Three’
y = str(d[0])+str(d[3])+str(d[2])
```

(a) ’ UnknownUnknownNone’

(b) ’ ZeroThreeUnknown’

(c) ’ ZeroThreeTwo’

(d) ’ ZeroThreeNone’

(e) Error

(2015s2 Q16) 108. What is the value of y after the following is evaluated?

```
d = {0:’ Zero’ , 1:’ One’ , 4:’ Four’ , 5:’ Unknown’ }
d[3] = ’ Three’
y = str(d.get(0))+str(d.get(3))+str(d.get(2))
```

(a) ’ UnknownUnknownNone’

(b) ’ ZeroThreeUnknown’

(c) ’ ZeroThreeTwo’

(d) ’ ZeroThreeNone’

(e) Error

(2015s2 Q17) 109. What is the value of y after the following is evaluated?

```
d = {0:’ Zero’ , 1:’ One’ , 4:’ Four’ , 5:’ Unknown’ }
d[3] = ’ Three’
y = str(d.get(0,’ Unknown’ ))+str(d.get(3,’ Unknown’ ))+str(d.get(2,’ Unknown’ ))
```

(a) ’ UnknownUnknownNone’

(b) ’ ZeroThreeUnknown’

(c) ’ ZeroThreeTwo’

(d) ’ ZeroThreeNone’

(e) Error

(2016s1 Q12) 110. What is the value of y after the following is evaluated?

d = {’ id_1’ : {’ type’ :’ animal’ , ’ name’ :’ Wallaby’ , ’ pos’ : [[[100,200], 1460245992.4755974]], ’ id’ :’ id_1’ , ’ gender’ :’ female’ , ’ tracker_id’ :’ 1234’ },

’ id_2’ : {’ type’ :’ plant’ , ’ id’ :’ id_2’ , ’ pos’ :[150,500], ’ name’ :’ Blackbutt’ }}

y = d.get(’ id_1’ , {}).get(’ tracker_id’ , ’ ’)

(a) None

(b) {}

(c) ’ ’

(d) ’ 1234’

(e) Error

(2016s1 Q13) 111. What is the value of y after the following is evaluated?

d = {’ id_1’ : {’ type’ :’ animal’ , ’ name’ :’ Wallaby’ ,

’ pos’ :[[[100,200], 1460245992.4755974]],

```
’ id’ :’ id_1’ ,’ gender’ :’ female’ ,’ tracker_id’ :’ 1234’ },
’ id_2’ : {’ type’ :’ plant’ ,’ id’ :’ id_2’ ,’ pos’ :[150,500], ’ name’ :’ Blackbutt’ }}
y = d.get(’ id_2’ , {}).get(’ tracker_id’ , ’ ’ )
```

(a) None

(b) {}

(c) ’ ’

(d) ’ 1234’

(e) Error

(2016s2 Q15) 112. What is the value of y after the following is evaluated?

```
d = {’ aaa’ : [1,2], ’ bbb’ :[3], ’ ddd’ :[]}
d[’ ddd’ ] = [4]
y = d[’ aaa’ ] + d[’ bbb’ ] + d[’ ccc’ ]
```

(a) [1, 2, 3]

(b) [1, 2, 4]

(c) [1, 2, None]

(d) Error

(2016s2 Q16) 113. What is the value of y after the following is evaluated?

```
d = {’aaa’: [1,2], ’bbb’:[3], ’ddd’:[]}
d[’ddd’] = [4]
y = d.get(’aaa’) + d.get(’bbb’) + d.get(’ccc’)
```

(a) [1, 2, 3]

(b) [1, 2, 4]

(c) [1, 2, None]

(d) Error

(2016s2 Q17) 114. What is the value of y after the following is evaluated?

```
d = {’aaa’: [1,2], ’bbb’:[3], ’ddd’:[]}
d[’ddd’] = [4]
y = d.get(’aaa’, []) + d.get(’bbb’, []) + d.get(’ccc’, [])
```

(a) [1, 2, 3]

(b) [1, 2, 4]

(c) [1, 2, None]

(d) Error

(2017s1 Q8) 115. What is the value of d after the following is evaluated?

```
d = {'a':1, 'b':2}
d[['a','b']] = 34
```

Note: for a dictionary the ordering of the elements does not matter .

a) {'a':1, 'b':2, ['a','b']:34}

b) {'a':1, 'b':2, 'a':3, 'b':4}

c) {'a':3, 'b':4}

d) Error

(2017s1 Q9) 116. What is the value of y after the following is evaluated?

```
d = {'Brisbane': {2013:24.1, 2014:24.2},
    'Adelaide': {2012:22.1, 2013:22.6, 2014:22.8}}
y = d.get('Brisbane', {}).get(2012)
```

a) None

b) {}

c) [24.1, 22.8]

d) {2013:24.1, 2014:24.2}

e) Error

(2017s1 Q10) 117. What is the value of y after the following is evaluated?

```
d = {'Brisbane': {2013:24.1, 2014:24.2},
    'Adelaide': {2012:22.1, 2013:22.6, 2014:22.8}}
y = d.get('Adelaide', {}).get(2012)
```

a) None

b) {}

c) 22.1

d) {2012:22.1, 2013:22.6, 2014:22.8}

e) Error

(2017s2 Q15) 118. What is the value of x after the following is evaluated?

```
d = {’ John’ : {’ ID’ : 234, ’ Orders’ : [’ soap’ , ’ bath mat’ ]}, ’ Lavinia’ : { ‘ID’ : 732,
’ Orders’ :
```

[’ mouthwash’ ,’ toothpaste’]}}

x=d.get(‘John’).get(‘Orders’ ,[])

(a) []

(b) [’ soap’ , ‘bath mat’]

(c) {}

(d) Error

(2017s2 Q16) 119. What is the value of x after the following is evaluated?

d = {’ John’ : {’ ID’ : 234, ’ Orders’ : [’ soap’ , ’ bath mat’]}, ’ Lavinia’ : { ‘ID’ : 732, ’ Orders’ :

[’ mouthwash’ ,’ toothpaste’]}}

x=d.get(‘Mary’ ,{}).get(‘Orders’ ,[])

(a) [’ soap’ ,’ bath mat’]

(b) []

(c) [’ mouthwash’ ,’ toothpaste’]

(d) Error

(2017s2 Q17) 120. What is the value of x after the following is evaluated?

d = {’ John’ : {’ ID’ : 234, ’ Orders’ : [’ soap’ , ’ bath mat’]}, ’ Lavinia’ : { ‘ID’ : 732, ’ Orders’ :

[’ mouthwash’ , ’ toothpaste’]}}

x=d.get(’ John’ ,{}).get(’ Orders’ ,[]).append(’ toothbrush’)

(a) [’ soap’ , ’ bath mat’ , [’ toothbrush’]]

(b) [’ soap’ , ’ bath mat’ , ’ toothbrush’]

(c) None

(d) Error

(2019s2 Q21) 121. What will be the value of y after the following statements are executed?

d1={1:'a', 2:'b'}

d2=d1

d2[3]='c'

y=d1.get(3,'e')

a) 'e'

b) 'c'

c) 'b'

d) None

e) Error

(2019s2 Q13) 122. After executing the following code:

Python

```python
a={1:"A",2:"B",3:"C"}
b={3:"D",5:"E"}
a.update(b.get(4,'Error'))
```

what would be the contents of a?

a) {1: 'A', 2: 'B', 3: 'C', 5: 'E'}

b) {1: 'A', 2: 'B', 3: 'D', 5: 'Error'}

c) {1: 'A', 2: 'B', 3: 'C', 4: 'Error'}

d) Error

e) None of the above

(2019s2 Q14) 123. What is the value of d2 after the following statements are evaluated?

```
d = {1:'a', 2:'b', 3:'c'}
d2=d.update({5:['def']})
```

a) {1:'a', 2:'b', 3:'c'}

b) {1: 'a', 2: 'b', 3: 'c', 5: ['def']}

c) {1: 'a', 2: 'b', 3: 'c', 5: 'def'}

d) None

e) Error

(2018s1 Q12) 124. What is the value of d after the following statements are evaluated?

```
d = {1:'a', 2:'b', 3:'c'}
d[4] = 'd'
d.get(5, 'e')
```

a) {5:'e'}

b) {1:'a', 2:'b', 3:'c'}

c) {1:'a', 2:'b', 3:'c', 4:'d'}

d) {1:'a', 2:'b', 3:'c', 4:'d', 5:'e'}

e) Error

(2018s2 Q16) 125. What is the value of x after the following is evaluated?

d = {'Jack Brown' : {'Student No': 532762, 'Courses':

['CSSE1001', 'ECON1010']}, 'Edith Slin': {'Student No':

743672, 'Courses': ['CSSE1001', 'SCIE1000']}}

x=d.get('Jack Brown').get('Courses',[])

a) []

b) ['CSSE1001', 'ECON1010']

c) None

d) {}

e) Error

(2018s2 Q17) 126. What is the value of x after the following is evaluated?

d = {'Jack Brown' : {'Student No': 532762, 'Courses':

['CSSE1001', 'ECON1010']}, 'Edith Slin': {'Student No':

743672, 'Courses': ['CSSE1001', 'SCIE1000']}}

x=d.get('Matthew Gown',{}).get('Courses',[])

a) ['CSSE1001', 'ECON1010']

b) []

c) None

d) {}

e) Error

(2018s2 Q18) 127. What is the value of x after the following is evaluated?

d = {'Jack Brown' : {'Student No': 532762, 'Courses':

['CSSE1001', 'ECON1010']}, 'Edith Slin': {'Student No':743672, 'Courses': ['CSSE1001', 'SCIE1000']}}

x=d.get('Jack Brown',{}).get('Courses', []).append('ENGG1400')

a) ['CSSE1001', 'ECON1010']

b) ['CSSE1001', 'ECON1010', 'ENGG1400']

c) None

d) Error

(2019s1 Q11) 128. What is the value of d after the following statements are evaluated?

d = {'eng':'Hello', 'fre':'Bonjour', 'spa':'Hola', 'chi':'Ni Hao'}

d['spa'] = 'Buenos Dias'

d.get('jpn', 'Konichiwa')

a) {'spa': 'Buenos Dias'}

b) {'eng': 'Hello', 'fre': 'Bonjour', 'spa': 'Hola', 'chi':'Ni Hao'}

c) {'eng': 'Hello', 'fre': 'Bonjour', 'spa': 'Buenos Dias', 'chi': 'Ni Hao'}

d) {'eng': 'Hello', 'fre': 'Bonjour', 'spa': 'Buenos Dias', 'chi': 'Ni Hao', 'jpn': 'Konichiwa'}

e) Error

(2020s1 Q14) 13. After executing the code below, what would be the contents of a?

```
a={1:"s",2:"t",3:"r"}
b={4:"i",5:"n"}
a.update({6:b.get(5)})
```

(a) {1: 's', 2: 't', 3: 'r'}

(b) {1: 's', 2: 't', 3: 'r', 6: 'n'}

(c) { }

(d) Error

(e) None of the other choices are correct

(2020s1 Q15) 14. What is the value of d2 after the following statements are evaluated?

```
d = {1:'a', 2:'b', 3:'c'}
d2 = d.update({5:['def']})
```

(a) {1: 'a', 2: 'b', 3: 'c', 5: 'def'}

(b) {1: 'a', 2: 'b', 3: 'c', 5: ['def']

(c) Error

(d) None

(e) {1:'a', 2:'b', 3:'c'}

(2020s2 Q13) 13. What is the value of d2 after the following statements are evaluated?

Python

```python
d1 = {1:'c', 2:'d', 3:'e'}
d2=d1.update({4:['f']})
```

(a) {1:'c', 2:'d', 3:'e'}

(b) {1:'c', 2:'d', 3:'e', 4:['f']}

(c) {1:'c', 2:'d', 3:'e', 4:'f'}

(d) None

(e) None of the other choices are correct

(2020s2 Q14) 14. After executing the code below, what would be the contents of a?

Python

```python
a={1:"s",2:"t",3:"r"}
b={4:"i",5:"n"}
a.update({6:b.get(7)})
```

(a) {1:'s', 2:'t', 3:'r'}

(b) {1: 's', 2: 't', 3: 'r', 6: None}

(c) {1: 's', 2: 't', 3: 'r', 6: []}

(d) Error

(e) None of the other choices are correct

(2021s1 Q11) 11. What is the value of d after the following statements are evaluated?

Python

```python
d = {'CA':'Maple Syrup', 'AU':'Vegemite', 'NZ':'Pavlova', 'FR':'Escargot'}
d['SP'] = 'Churro'
d.get('JP', 'Sushi')
```

a) {'JP': 'Sushi'}

b) {'SP': 'Churro'}

c) {'CA': 'Maple Syrup', 'AU': 'Vegemite', 'NZ': 'Pavlova',

'FR': 'Escargot'}

d) {'CA': 'Maple Syrup', 'AU': 'Vegemite', 'NZ': 'Pavlova',

'FR': 'Escargot', 'SP': 'Churro'}

e) {'CA': 'Maple Syrup', 'AU': 'Vegemite', 'NZ': 'Pavlova', 'FR': 'Escargot', 'SP': 'Churro', 'JP': 'Sushi'}

Scope of Variables 作用域

(2016s2 Q14) 129. What is the value of a after the following is evaluated?

Python

```python
def f(x, y):
      y = y + [x]
      return y

a = [1,3]
a = f(2,a) + a
```

(a) [1, 3, 1, 2]

(b) [1, 3, 2, 1, 3]

(c) [2, 1, 3, 3, 1, 2]

(d) [1, 2, 3, 1, 2, 3]

(e) None of the above

(2017s2 Q14) 130. What is the value of a after the following is evaluated?

Python

```python
def f(x, y):
      y = y + [x]
      return y

a = [2,1]
a = f(1,a) + 2 * a
```

(a) [1, 3, 1, 2]

(b) [2, 1, 1, 2, 1, 2, 1]

(c) [2, 1, 1, 4, 2]

(d) [1, 2, 3, 1, 2, 3, 2]

(e) None of the above

(2019s2 Q17) 131. What is the value of a after the following code is executed?

Python

```python
def f(x):
    a = 70
    x += a
    return a
a = 50
f(a)
```

a) 50

b) 70

c) 120

d) None of the above

(2019s2 Q18) 132. What is the value of x after the following code is executed?

Python

```python
def f(l, a, b) :
    l.append(a)
    l = l + [b]
    return l

x = [5, 9]
x = f(x, 2, 1) + x
```

a) [5, 9, 2, 1]

b) [5, 9, 2, 1, 5, 9]

c) [5, 9, 2, 1, 5, 9, 2]

d) [5, 9, 2, 1, 5, 9, 2, 1]

e) Error

(2018s2 Q14 易错题) 133. What is the value of y after the following code is executed?

Python

```python
def g(x):
    a = 11
    x += [2]
    return a

a = 10
b = [3, 4]
g(b)
y = b + [a]

```

a) [3, 4, 2, 10]

b) [3, 4, 2, 11]

c) [3, 4, 10]

d) [3, 4, 11]

e) None of the above

(2018s2 Q15) 134. What is the value of x after the following code is executed?

Python

```python
def f(v, u, b) :
    v.pop(u)
    v = v + [b]
    return v

x = [2, 3, 5]
x = f(x, 2, 3) + x
```

a) [2, 3, 3, 2, 3, 5]

b) [2, 3, 5, 2, 3]

c) [2, 3, 5, 3, 2]

d) [2, 3, 3, 2, 3]

(2018s1 Q14) 135. What is the value of the global variable a after the following code is executed?

Python

```python
def f(x) :
    a = 100
    x += a
    return x + a

a = 1
f(a)

```

a) 1

b) 100

c) 101

d) 201

e) Error

(2018s1 Q15) 136. What is the value of x after the following code is executed?

Python

```python
def f(l, a, b) :
    l.append(a)
    l = l + [b]
    return l

x = [5, 9]
x = f(x, 2, 1) + x
```

a) [5, 9, 2, 1]

b) [5, 9, 2, 1, 5, 9]

c) [5, 9, 2, 1, 5, 9, 2]

d) [5, 9, 2, 1, 5, 9, 2, 1]

e) Error

(2019s1 Q12) 137. What is the value of the global variable a after the following code is executed?

Python

```python
def f(x) :
    a = 3
    x = x / a
    return (a + x) % x

a = 9
f(a)
```

a) 9

b) 3

c) 0

d) 0.0

e) Error

(2019s1 Q13) 138. What is the value of x after the following code is executed?

Python

```python
def f1(a, b) :
    return a / b

def f2(a, b) :
    b = 10
    return f1(b, a)

x = f2(8, 4)
```

a) 0.5

b) 1.25

c) 2.0

d) 2.5

Type Hint 类型推导

The following function outputs the power given the voltage (as a float) and the current (as a float).

Python

```python
def power(voltage, current) :
    print(str(voltage * current) + " W")
```

What is the return type of this function?

a) str

b) None

c) float

d) int

Recall def foo(x: int) -> int: is type-hinted whereas def bar(): is not. What statement is true about type-hints (i.e. type contracts).

A. Type-hints signal the user of the expected input to a function.

B. Type-hints are enforced. That is, if you pass a function a value with a different type than what is type-hinted Python will throw an error.

C. Python will throw an error if a function is not type-hinted.

D. None of the above.

Suppose the following function definition has been made.

Python

```python
def foo(x: int, y: int):
    print(x/y)
```

What is type(foo(1, 2))?

A. <class 'int'>

B. <class 'float'>

C. <class 'str'>

D. <class 'NoneType'>

What is the most appropriate type hint (i.e. type contract) for the following?

Python

```python
def foo(x, y):
    ans = ""
    for n in x:
        for m in y:
            ans += n*m
    return ans
```

A. foo(x: int, y: str) -> str:

B. foo(x: int, y: list[str]) -> str:

C. foo(x: list[int], y: str) -> str:

D. foo(x: list[int], y: list[str]) -> list[str]:

Consider the following function:

Python

```python
def bar(x, y, z):
    if len(x) > z[0]:
        if y in z:
            print(y)
    return y[0]
```

Which (if any) is a possible type-contract for bar?

a) def bar(x: list[str], y: str , z: list[int]) -> None

b) def bar(x: int, y: list[str], z: int) -> int

c) def bar(x: str, y: str, z: str) -> str

d) def bar(x: list[str], y: str , z: list[int]) -> str

e) None of the above

What is the appropriate type-hint for the following function, assuming the function contains valid code and can be called without generating an error?

Python

```python
def foo(x, y, z):
    for z in y:
        if x in z:
            z.append(x)
    return x * y[0] + z
```

A. foo(x: str, y: list[str], z: str) -> str

B. foo(x: int, y: list[list[int]], z: list[int]) -> list[int]

C. foo(x: int, y: list[str], z: str) -> None

D. foo(x: int, y: list[int], z: int) -> list[int]

What type of error is thrown by executing the following code?

Python

```python
def foo(x: str, y: str) -> str:
    """
    >>> foo("Monty", "Python")
    'MontyPython'
    """
    return x + y

ans = foo(2, 1/3)
```

A. TypeError

B. NameError

C. ValueError

D. This is valid Python code.

Consider the following function.

Python

```python
def bar(x, y):
    for k in x:
        if y in k:
            return True
    return False
```

Which (if any) is a possible type-contract for bar?

A. def bar(x: int, y: int) -> bool

B. def bar(x: List[str], y: str) -> bool

C. def bar(x: List[int], y: bool) -> bool

D. def bar(x: List, y: List[List]) -> bool

E. None of the above.

❗ 以下内容仅在期末出现

Class基本结构和基本方法

(2015s1 Q27-29)

139-141. The next three questions refer to the following partial definition of a Player class.

Python

```python
class Player(object):

    def __init__(self, name, health):
        self._name = name
        self._health = health

    def update_health(self, amount):
        """Update the players health by amount (may be negative)"""
        ## line 1 ##

    def get_health(self):
        """Return the players health."""
        ## line 2 ##

frodo = Player(’Frodo’, 10)
```

(2015s1 Q27) 139. What is the required code for ## line 1 ## so that the method satisfies the comment?

(a) health += amount

(b) _health += amount

(c) self.health += amount

(d) self._health += amount

(e) More than one of the above is correct.

(2015s1 Q28) 140. What is the required code for ## line 2 ## so that the method satisfies the comment?

(a) print(self.health)

(b) return self.health

(c) print(self._health)

(d) return self._health

(e) More than one of the above is correct.

(2015s1 Q29) 141. Which of the following correctly updates the health by -10 for the object frodo?

(a) frodo.update_health(-10)

(b) update_health(frodo, -10)

(c) frodo.update_health() += -10

(d) update_health(frodo) += -10

(e) More than one of the above is correct.

(2015s2 Q33-35)

142-144. The next three questions refer to the following partial definition of a BankAccount class.

Python

```python
class BankAccount(object):

    def __init__(self, customer):
        """customer is the name of the account owner """
        self._customer = customer
        # the balance on the account in dollars
        self._balance = 0.0

    def deposit(self, amount):
        """Deposit amount into the account.
        deposit(float) -> None """
        ## line 1 ##

    def get_balance(self):
        """Get the balance. get_balance() -> float """
        ## line 2 ##


Assume that the following has been evaluated.

john= BankAccount('John Smith')
```

(2015s2 Q33) 142. What is the required code for ## line 1 ## to meet the description in the comments?

(a) _balance += amount

(b) balance += amount

(c) self._balance += amount

(d) balance=balance+amount

(e) More than one of the above is correct

(2015s2 Q34) 143. What is the required code for ## line 2 ## to meet the description in the comments?

(a) print self.balance

(b) print self._balance

(c) return self.amount

(d) return self._balance

(e) More than one of the above is correct.

(2015s2 Q35) 144. Which of the following correctly updates the balance by $2.75 for the object john?

(a) john.deposit(2.75)

(b) john.deposit() + 2.75

(c) deposit(john, 2.75)

(d) deposit(john) + 2.75

(e) More than one of the above is correct.

(2016s2 Q18-20)

145-147. The next three questions refer to the following partial definition of a Student class for information about a student.

Python

```python
class Student(object):

    def __init__(self, name):
        self._name = name
        self._results = {}

    def add_result(self, courseid, grade):
        """Add the grade for the given course to the results dictionary.
        add_result(str, int) -> None"""
        ## line 1 ##

    def get_grade(self, courseid):
        """Return the grade for the given course. Raises an error if courseid is not present.
        get_grade(str) -> int"""
        ## line 2 ##


Assume that the following has been evaluated.

mbrown = Student("Mary Brown")

```

(2016s2 Q18) 145. What is the required code for ## line 1 ##?

(a) Student._results = {courseid:grade}

(b) Student._results[courseid] = grade

(c) self._results = {courseid:grade}

(d) self._results[courseid] = grade

(e) More than one of the above is correct.

(2016s2 Q19) 146. What is the required code for ## line 2 ##?

(a) print Student._results[courseid]

(b) return Student._results[courseid]

(c) print self._results[courseid]

(d) return self._results[courseid]

(e) More than one of the above is correct.

(2016s2 Q20) 147. Which of the following correctly updates the results for mbrown with a grade of 6 for ’ CSSE1001’ .

(a) add_result(mbrown, ’ CSSE1001’ , 6)

(b) add_result(mbrown)[’ CSSE1001’] = 6

(c) mbrown.add_result(’ CSSE1001’ , 6)

(d) mbrown.add_result[’ CSSE1001’] = 6

(e) More than one of the above is correct.

(2017s2 Q18-20)

148-150. The next three questions refer to the following partial definition of a GoCard class.

Python

```python
class GoCard(object):

    def __init__(self, owner):
        self._owner = owner
        # balance on the card in dollars
        self._balance = 5.00

    def update_balance(self, amount):
        """Update the balance with amount.
                If amount > 0, the GoCard is topped up by amount
                If amount < 0, the balance is reduced by the amount of the trip"""
        ## line 1 ##

    def get_balance(self):
        """Return the balance."""
        ## line 2 ##

Assume that the following has been evaluated.

martin = GoCard("Martin Avis")
```

(2017s2 Q18) 148. What is the required code for ## line 1 ##?

(a) balance += amount

(b) __balance__ +=amount

(c) self.balance += amount

(d) self._balance += amount

(e) None of the above.

(2017s2 Q19) 149. What is the required code for ## line 2 ##?

(a) print GoCard._balance

(b) return GoCard._balance

(c) print self._balance

(d) return self._balance

(e) None of the above.

(2017s2 Q20) 150. Which of the following correctly updates the GoCard balance for fred after a trip costing 3.50?

(a) update_balance(fred, -3.50)

(b) fred.update_balance(self, -3.50)

(c) fred.update_balance(3.50)

(d) fred.update_balance(self, -3.50)

(e) None of the above.

(2018s2 Q26-28)

151-153. The next three questions refer to the following partial definition of a BankAccount class.

Python

```python
class BankAccount(object):

    def __init__(self, customer):
        """customer is the name of the account owner """
        self._customer = customer
        # the balance on the account in dollars
        self._balance = 0.0

    def deposit(self, amount):
        """Deposit amount into the account.
        deposit(float) -> None """
        ## line 1 ##

    def get_balance(self):
        """Get the balance. get_balance() -> float """
        ## line 2 ##

Assume that the following has been evaluated.

ed_gal = BankAccount('Edward Gal')
```

(2018s2 Q26) 151. What is the required code for ## line 1 ## to meet the description in the comments?

a) _balance += amount

b) balance += amount

c) self._balance += amount

d) balance = balance + amount

e) More than one of the above is correct

(2018s2 Q27) 152. What is the required code for ## line 2 ## to meet the description in the comments?

a) print self.balance

b) print self._balance

c) return self.amount

d) return self._balance

e) More than one of the above is correct.

(2018s2 Q28) 153. Which of the following correctly updates the balance by $35.00 for the object ed_gal?

a) ed_gal.deposit(35.00)

b) ed_gal.deposit() + 35.00

c) deposit(ed_gal, 35.00)

d) deposit(ed_gal) + 35.00

e) More than one of the above is correct.

(2018s1 Q26-28)

154-156. The following partial definition of a bank account class is used in the following three questions.

Python

```python
class BankAccount(object) :

    def __init__(self, account_number,
                 initial_deposit, over_draft) :
        """
        Parameters:
            account_number (str): Bank account number
                                  for this account.
            initial_deposit (int): Initial amount deposited
                                   into this account.
            over_draft (int): Over draft limit for this
                              account.
        """
        self._account_number = account_number
        self._balance = initial_deposit
        self._over_draft = over_draft

    def credit(self, amount) :
        """Deposit 'amount' into this account."""
        ## code block 1 ##

    def debit(self, amount) :
        """Withdraw 'amount' from this account.
           Return True if account balance and over draft
                  limit will allow withdrawal;
                  False otherwise.
        """
        ## code block 2 ##
```

(2018s1 Q26) 154. What is the required code for ## code block 1 ##?

a) _balance += amount

b) _balance() += amount

c) self._balance += amount

d) self._balance() += amount

e) None of the statements above are correct.

(2018s1 Q27) 155. What is the required code for ## code block 2 ##?

a)

Python

```python
if self._balance + self._over_draft > amount :
    self._balance -= amount
    return True
else :
    return False
```

b)

Python

```python
if _balance + _over_draft > amount :
    _balance -= amount
    return True
else :
    return False
```

c)

Python

```python
return self._balance -= amount
```

d)

Python

```python
return ._balance -= amount
```

(2018s1 Q28) 156. After the following statement is executed:

Apache

```
account = BankAccount("123", 100, 100)
```

Which of the following statements will cause the debit method to return False? (Assume that ## code block 1 ## and ## code block 2 ## contain the correct code.)

a) account.debit() - 250

b) account.debit(250)

c) debit(account) - 250

d) debit(account, 250)

e) None of the statements above will cause the debit

method to return False.

(2019s1 Q28-30)

157-159. The following partial definition of a student class is used in the following three questions.

Python

```python
class Student(object) :

    def __init__(self, student_number, name) :
        """
        Parameters:
            student_number (str): Student's id number.
            name (str): Student's full name.
        """
        self._student_number = student_number
        self._name = name
        self._results = { } # Dictionary of results,
                            # course code is the key
                            # mapped to grade achieved.

    def add_result(self, course_code, grade) :
        """Record grade student achieved in course_code.

        Parameters:
            course_code (str): Course student has completed.
            grade (int): Grade student achieved (0-7).

        Pre-conditions:
            0 <= grade <= 7
        """
        ## code block 1 ##

    def get_gpa(self) :
        """(int) Return the student's current GPA.
           GPA is recalculated each time this method is called.
        """
        ## code bloc
```

(2019s1 Q28) 157. What is the required code for ## code block 1 ##?

a) self._results[grade] = course_code

b) self._results[course_code] = grade

c) self._results.get(course_code, grade)

d) self._results.set(course_code, grade)

e) None of the statements above are correct.

(2019s1 Q29) 158. What is the required code for ## code block 2 ##?

(a) return sum(self._results) / len(self._results)

(b)

```
sum_of_grades = 0
for grade in self._results :
   sum_of_grades += grade
return sum_of_grades / len(self._results)
```

(c)

```
sum_of_grades = 0
for course in self._results :
   sum_of_grades += self._results.pop(course)
return sum_of_grades / len(self._results)
```

(d)

```
sum_of_grades = 0
for course, grade in self._results.items() :
   sum_of_grades += grade
return sum_of_grades / len(self._results)
```

(e) None of the statements above are correct.

(2019s1 Q30) 159. After the following statement is executed:

```
me = Student("12345678", "My Name")
```

Which of the following sets of statements will result in "GPA is: 6.0" being output? Assume that ## code block 1 ## and ## code block 2 ## contain the correct code.

a)

```
Student.add_result(me, "CSSE1001", 6)
Student.add_result(me, "INFS1200", 6)
print("GPA is:", Student.get_gpa(me))
```

b)

```
Student.add_result("CSSE1001", 6)
Student.add_result("INFS1200", 6)
print("GPA is:", Student.get_gpa())
```

c)

```
me.add_result("CSSE1001", 6)
me.add_result("INFS1200", 6)
print("GPA is:", me.get_gpa())
```

d)

```
add_result(me, "CSSE1001", 6)
add_result(me, "INFS1200", 6)
print("GPA is:", get_gpa(me))
```

e) None of the statements above will result in "GPA is: 6.0" being output.

(2019s2 Q27-29)

160-162. The following partial definition of a SwimRecord class is used in the following three questions.

Python

```python
class SwimRecord(object) :

    def __init__(self, name, club) :
        """Parameters:
        name(str): swimmer’s name
        club(str): swimmer’s club
        swim_record(dict): record of swim times
        """
        self._name = name
        self._club = club
        self._swim_record = {}

    def update_swim_record(self, new_results: dict) :
        """Add the dictionary, 'new_results', into the
   current dictionary of swim results."""
        ## code block 1 ##

    def get_swim_results(self, swim_meet: str) :
        """Get swim results."""
        return self._swim_record.get(swim_meet,'Err')

    def get_personal_best(self) :
        """Get the shortest time from all swim meets in the
        swim_record. Assume all swim meet events are over
        the same distance."""
        ## code block 2 ##
```

(2019s2 Q27) 160. What is the required code for ## code block 1 ##?

a) self._swim_record += new_results

b) self._swim_record.update(new_results)

c) self._swim_record.append(new_results)

d) None of the code blocks above are correct.

(2019s2 Q28) 161. What is the required code for ## code block 2 ##?

a) return min(self._swim_record.items())

b) return min(self._swim_record.values())

c) return min(self._swim_record.keys())

d) return self._swim_record.pop()

e) More than one of the above

(2019s2 Q29) 162. Assume that an object from the SwimRecord class has been created and has the name john_sullivan. Assume also that it contains an accurate record of the past year’ s swim results, including those for the 'Noosa' swim meet. Which of the following will return the swim results for the 'Noosa' swim meet

for John Sullivan?

a) john_sullivan.get_swim_results('Noosa')

b) john_sullivan._swim_record('Noosa')

c) john_sullivan._swim_record['Noosa']

d) More than one of the above

e) None of the above.

(2017s1 Q32-34)

163-165. The next three questions refer to the following partial definition of a GoCard class.

Python

```python
class GoCard :

    def __init__(self, user, initial_balance) :
        """
        Parameters:
            user (str): Name of the GoCard user.
            initial_balance (float): Initial amount
                                     loaded on to GoCard.
        """
        self._user = user
        # the balance on the card in dollars
        self._balance = initial_balance

    def update_balance(self, value) :
        """Update the balance with 'value'.
            value > 0 - the card is topped up
            value < 0 - the value of the trip
        """
        ## line 1 ##

    def get_balance(self) :
        """(float) Return the balance."""
        ## line 2 ##
```

Assume that the following has been evaluated.

Nginx

```nginx
Fred = GoCard('Fred', 100)
```

(2017s1 Q32) 163. What is the required code for ## line 1 ##?

a) balance += value

b) _balance += value

c) self.balance += value

d) self._balance += value

e) More than one of the above is correct.

(2017s1 Q33) 164. What is the required code for ## line 2 ##?

a) print self.balance

b) return self.balance

c) print self._balance

d) return self._balance

e) More than one of the above is correct.

(2017s1 Q34) 165. Which of the following correctly updates the balance by -$2.75 for the object fred?

a) update_balance(fred) - 2.75

b) update_balance(fred, -2.75)

c) fred.update_balance(-2.75)

d) fred.update_balance() - 2.75

e) More than one of the above is correct.

(2020s1 Q26-28)

The following partial definition of a SwimRecord class is used in this and the following two questions.

Python

```python
class SwimRecord(object) :
    def __init__(self, name, club) :
        """Parameters:
        name(str): swimmer’s name
        club(str): swimmer’s club
        self._swim_record(dict): Data record to store
swim meets and
        swim times. The key is the name of the
        swim meet; the value is the time recorded for
each swim meet"""
        self._name = name
        self._club = club
        self._swim_record = {}

    def update_swim_record(self, new_results: dict) :
        """Add results from 'new_results' into
record."""
        ## code block 1 ##

    def get_swim_results(self, swim_meet: str) :
        """Get swim results."""
        return self._swim_record.get(swim_meet,'Err')

    def get_swim_times(self) :
        """Return all swim times in a list"""
        ## code block 2 ##
```

(2020s1 Q26) 25. What is the required code for ## code block 1 ##?

(a) self._swim_record += new_results

(b) self._swim_record.update(new_results)

(c) self._swim_record.append(new_results)

(d) None of the other code blocks are correct.

(2020s1 Q27) 26. What is the required code for ## code block 2 ## ?

(a) return [j for i,j in self._swim_record.items()]

(b) return self._swim_record

(c) return list(self._swim_record.keys())

(d) return swim_record.update(self)

(e) More than one of the other choices are correct

(2020s1 Q28) 27. **After the assignment** z='ministry of silly walks' **what does the expression** '----' . join(z.split('silly')) **evaluate to**?

(a) ['ministry', 'of', '----', 'walks']

(b) '----silly'

(c) 'ministry of ---- walks'

(d) None of the other choices are correct

(2020s2 Q25-27)

The following partial definition of a SwimRecord class is used in this and the following two questions.

Python

```python
class SwimRecord(object) :
         def __init__(self, name, club) :
             """Parameters:
             name(str): swimmer’s name
             club(str): swimmer’s club
             self._swim_record(dict): Data record to store
             swim meets and swimtimes. The key is the name of
             the swim meet; the value is the time recorded for
             each swim meet"""
             self._name = name
             self._club = club
             self._swim_record = {}

        def update_swim_record(self, new_results: dict) :
             """Add results from 'new_results' into record."""
             self._swim_record.update(new_results)
        def drop_item(self, swim_meet):
            """ Remove from the record the item whose key is swim_meet"""
            ## code block 1 ##
        def get_swim_results(self, swim_meet: str) :
             """Get swim results."""
             return self._swim_record.get(swim_meet,'Err')
        def get_swim_times(self) :
             """Return all swim meets in a list"""
            ## code block 2 ##
```

(2020s2 Q25) 25. What is the required code for ## code block 1 ##?

(a) self._swim_record -= self._swim_record[swim_meet]

(b) self._swim_record.pop(swim_meet)

(c) self._swim_record[swim_meet]=None

(d) None of the other choices is correct

(2020s2 Q26) 26. What is the required code for ## code block 2 ##?

(a) return [i for i,j in self._swim_record.items()]

(b) return self._swim_record

(c) return list(self._swim_record.values())

(d) return swim_record.update(self)

(c) More than one of the other choices are correct

(2020s2 Q27) 27. Assume that an object from the SwimRecord class has been created and has the name **Mary_Brown.** Assume also that it contains an accurate record of the past year’ s swim results, including those for the **'Southport'** swim meet. Which of the following will return the swim results for the **'Southport'** swim meet for **Mary_Brown**?

(a) Mary_Brown.get_swim_results('Southport')

(b) Mary_Brown._swim_record('Southport')

(c) Mary_Brown._swim_record[get_swim_results('Southport')]

(d) More than one of the above

(c) None of the above.

(2021s1 Q23) 23. For the following block of code, assume that Position, Entity, Player and Zombie are the classes that were defined in assignment two.

Python

```python
class Locations:
    def __init__(self):
        self._positions = []
        self._entities = []

    def add_entity(self, position: Position, entity: Entity) -> None:
        self._positions.append(position)
        self._entities.append(entity)

    def get_entity(self, position: Position) -> Optional[Entity]:
        for i, p in enumerate(self._positions):
            if p == position:
                return self._entities[i]


l = Locations()
l.add_entity(Position(1, 1), Player())
l.add_entity(Position(2, 2), Zombie())
p = l.get_entity(Position(1, 1))
```

Which of the following programming constructs would most significantly simplify the above code?

a) dictionary

b) tuple

c) while loop

d) if statement

e) function

(2021s1 Q24) 24. The following is an extract of code from the Inventory class from assignment two. Part of the implementation of the step method has been removed.

Python

```python
class Inventory:
    def __init__(self):
        self._items = []

    def step(self):
        """
        When this method is called, the lifetime of every item
        stored within the inventory should decrease. Any items
        in the inventory that have exceeded their lifetime should
        be removed.
        """
        new_items =  ## Fragment 1 ##
        for item in self._items:
            item.hold()
            if item.get_lifetime() > 0:
                new_items.append(item)
        ## Fragment 2 ##
```

Which code fragments below will correctly complete the function above?

a) Fragment 1 is: self._items

Fragment 2 is: self._items = new_items

b) Fragment 1 is: self._items

Fragment 2 is: new_items = self._items

c) Fragment 1 is: []

Fragment 2 is: self._items = new_items

d) Fragment 1 is: []

Fragment 2 is: new_items = self._items

e) None of the code fragments would implement the function correctly.

The following partial definition of a shopping basket class, to be used in an online store, is used in the following three questions.

Python

```

class ShoppingBasket:
    def __init__(self):
        self._items = {}  # Dictionary of items in this basket.
                          # Item stock id is the key mapped
                          # to the price of the item.

    def add_item(self, item_id: str, price: float) -> None:
        """Add an item to this basket.

        Parameters:
            item_id: The item's stock id.
            price: The item's price.
        """
        ## Fragment 1 ##

    def total(self) -> float:
        """Return the total price of all items in this basket."""
        total_price = 0
        ## Fragment 2 ##
        return total_price
```

(2021s1 Q29) 29. What is the required code for ## Fragment 1 ##?

a) self._items.get(item_id, price)

b) self._items.set(item_id, price)

c) self._items[item_id] = price

d) self._items[price] = item_id

e) None of the code fragments would implement the method correctly.

(2021s1 Q30) 30. What is the required code for ## Fragment 2 ##?

a)

Plain Text

```
for price in self._items.items():
    total_price += price
```

b)

Plain Text

```
for price in self._items.values():
    total_price += price
```

c)

Plain Text

```
for price in self._items():
    total_price += price
```

d)

Python

```python
for price in self._items:
    total_price += price
```

e) None of the code fragments would implement the method correctly.

(2021s1 Q31) 31. Assuming that the ShoppingBasket class is implemented correctly, which of the

following sets of statements is the best approach to output "The total is 30"?

a)

Python

```python
basket = ShoppingBasket()
ShoppingBasket.add_item(basket, "1", 10)
ShoppingBasket.add_item(basket, "2", 20)
print("The total is", ShoppingBasket.total(basket))
```

b)

Python

```
basket = ShoppingBasket()
ShoppingBasket.add_item("1", 10)
ShoppingBasket.add_item("2", 20)
print("The total is", ShoppingBasket.total())
```

c)

Python

```
basket = ShoppingBasket()
basket.add_item("1", 10)
basket.add_item("2", 20)
print("The total is", basket.total())
```

d)

Python

```
basket = ShoppingBasket()
add_item(basket, "1", 10)
add_item(basket, "2", 20)
print("The total is", total(basket))
```

e) None of these statements will result in "The total is 30" being output.

继承中方法的查找顺序（MRO）

(2015s1 Q30-34)

166-170. The five questions on the following page refer to the class definitions and assignments given below.

Python

```python
class A(object):
    def __init__(self, x):
        self.x = x

    def f(self, x):
        return self.g(x) + 1

    def g(self, x):
        return x + 1

class B(A):
    def g(self, y):
        return y + self.x

class C(B):
    def __init__(self, x, y):
        super().__init__(x)
        self.y = y
        self.x += y
    def g(self, y):
        return y
    def f(self, x):
        return super().g(x) + self.y
class D(C):
    def __init__(self, x, y):
        super().__init__(x, y)
        self.y = y + x

    def g(self, x):
        return x + self.x


a = A(2)
b = B(2)
c = C(2, 2)
d = D(2, 0)

```

(2015s1 Q30) 166. What does the expression b.g(3) evaluate to?

(a) 5

(b) 6

(c) 7

(d) 9

(e) Error

(2015s1 Q31) 167. What does the expression a.f(3) evaluate to?

(a) 5

(b) 6

(c) 7

(d) 9

(e) Error

(2015s1 Q32) 168. What does the expression b.f(3) evaluate to?

(a) 5

(b) 6

(c) 7

(d) 9

(e) Error

(2015s1 Q33) 169. What does the expression c.f(3) evaluate to?

(a) 5

(b) 6

(c) 7

(d) 9

(e) Error

(2015s1 Q34) 170. What does the expression d.f(3) evaluate to?

(a) 5

(b) 6

(c) 7

(d) 9

(e) Error

(2016s1 Q30-34)

171-175. The five questions on the following page refer to the class definitions and assignments given below.

Python

```python
class A(object):
    def __init__(self, x):
        self.x = x

    def g(self, x):
        return self.f(x)

    def f(self, x):
        return 2 * x

class B(A):
    def g(self, y):
        return 2 * y + self.x

class C1(B):
    def __init__(self, x, y):
        super().__init__(x)
        self.y = y

    def f(self, x):
        return super().f(x) + self.y


class C2(B):
    def __init__(self, x, y):
        super().__init__(x)
        self.y = y + x

    def g(self, x):
        return x + self.x


a = A(2)
b = B(2)
c1 = C1(2, 1)
c2 = C2(1, 2)
```

(2016s1 Q30) 171. What does the expression b.g(2) evaluate to?

(a) 3

(b) 4

(c) 6

(d) 7

(e) Error

(2016s1 Q31) 172. What does the expression a.f(3) evaluate to?

(a) 3

(b) 4

(c) 6

(d) 7

(e) Error

(2016s1 Q32) 173. What does the expression b.f(2) evaluate to?

(a) 3

(b) 4

(c) 6

(d) 7

(e) Error

(2016s1 Q33) 174. What does the expression c1.f(3) evaluate to?

(a) 3

(b) 4

(c) 6

(d) 7

(e) Error

(2016s1 Q34) 175. What does the expression c2.g(2) evaluate to?

(a) 3

(b) 4

(c) 6

(d) 7

(e) Error

(2016s2 Q31-35)

176-180. The next five questions refer to the class definitions and assignments given below.

Python

```python
class A(object):

    def __init__(self, x):
        self.x = x

    def g(self, x):
        return self.f(x)

    def f(self, x):
        return 2 * x

class B(A):

    def g(self, y):
        return self.x + 3 * y
class C1(B):

    def __init__(self, x, y):
        B.__init__(self, x)
        self.y = y

    def f(self, x):
        return self.x + self.y




class C2(B):

    def __init__(self, x, y):
        B.__init__(self, x)
        self.y = y

    def f(self, x):
        return x + self.x + self.y

a = A(3)
b = B(2)
c1 = C1(3, 5)
c2 = C2(3, 5)
```

(2016s2 Q31) 176. What does the expression b.g(2) evaluate to?

(a) 6

(b) 7

(c) 8

(d) 9

(e) None of the above

(2016s2 Q32) 177. What does the expression a.f(4) evaluate to?

(a) 5

(b) 6

(c) 7

(d) 8

(e) None of the above

(2016s2 Q33) 178. What does the expression b.f(5) evaluate to?

(a) 5

(b) 8

(c) 10

(d) 12

(e) None of the above

(2016s2 Q34) 179. What does the expression c1.g(2) evaluate to?

(a) 9

(b) 12

(c) 14

(d) 16

(e) None of the above

(2016s2 Q35) 180. What does the expression c2.f(4) evaluate to?

(a) 9

(b) 12

(c) 14

(d) 16

(e) None of the above

(2017s2 Q31-35)

181-185. The next five questions refer to the class definitions and assignments given below.

Python

```python
class A(object):
```

```python
class A(object):

    def __init__(self, x):
        self.x = x

    def g(self, x):
        return self.f(x)

    def f(self, x):
        return 3 * x


class B(A):

    def g(self, y):
        return self.x + 2 * y


class C1(B):

    def __init__(self, x, y):
        B.__init__(self, x)

        self.y = y

        def f(self, x):
            return self.x + self.y




class C2(B):

    def __init__(self, x, y):
        B.__init__(self, x)

        self.y = y

    def f(self, x):
        return x + self.x + 2 * self.y

a = A(2)
b = B(1)
c1 = C1(2, 4)
c2 = C2(2, 4)

```

(2017s2 Q31) 181. What does the expression b.f(3) evaluate to?

(a) 6

(b) 7

(c) 8

(d) 9

(e) None of the above

(2017s2 Q32) 182. What does the expression a.f(3) evaluate to?

(a) 6

(b) 7

(c) 8

(d) 9

(e) None of the above

(2017s2 Q33) 183. What does the expression b.g(2) evaluate to?

(a) 5

(b) 6

(c) 7

(d) 8

(e) None of the above

(2017s2 Q34) 184. What does the expression c1.g(3) evaluate to?

(a) 6

(b) 7

(c) 8

(d) 9

(e) None of the above

(2017s2 Q35) 185. What does the expression c2.f(2) evaluate to?

(a) 10

(b) 11

(c) 12

(d) 13

(e) None of the above

(2015s2 Q28-32)

186-190. The next five questions refer to the class definitions and assignments given below.

Python

```python
class A(object):

    def __init__(self, x):
        self.x = x

    def g(self, x):
        return self.f(x)

    def f(self, x):
        return 2 * x - 1


class B(A):

    def g(self, y):
        return self.x + 2 * y


class C1(B):

    def __init__(self, x, y):
        B.__init__(self, x)

        self.y = y

    def f(self, x):
        return self.x + self.y




class C2(B):

    def __init__(self, x, y):
        B.__init__(self, x)

        self.y = y

    def f(self, x):
        return x + self.x + self.y


a = A(2)
b = B(3)
c1 = C1(3, 2)
c2 = C2(3, 2)
```

(2015s2 Q28) 186. What does the expression b.g(3) evaluate to?

(a) 6

(b) 7

(c) 8

(d) 9

(e) None of the above

(2015s2 Q29) 187. What does the expression a.f(3) evaluate to?

(a) 5

(b) 6

(c) 7

(d) 8

(e) None of the above

(2015s2 Q30) 188. What does the expression b.f(3) evaluate to?

(a) 4

(b) 5

(c) 6

(d) 7

(e) None of the above

(2015s2 Q31) 189. What does the expression c1.f(3) evaluate to?

(a) 4

(b) 5

(c) 6

(d) 7

(e) None of the above

(2015s2 Q32) 190. What does the expression c2.f(3) evaluate to?

(a) 6

(b) 7

(c) 8

(d) 9

(e) None of the above

(2018s2 Q32-36)

191-195. The next five questions refer to the following class definitions.

Python

```python
class A(object) :
    def __init__(self, x, y) :
        self._x = x
        self._y = y
    def a1(self, x, y) :
        return self.a2(x, y) +3
    def a2(self, x, y) :
        return y - x

class B(A) :
    def a2(self, x, y) :
        return x + 2* y

class C(B) :
    def __init__(self, x, y) :
        super().__init__(x, y)
        self._x = x
        self._y = 2*y+x
    def a1(self, x, y) :
        return self._x + self._y

class D(B) :
    def __init__(self, x, y) :
        super().__init__(x, y)
        self._x = x
        self._y = y-1
    def a1(self, x, y)  :
        return x + y +1
    def a2(self, x, y) :
        return super().a2(x, y)

a = A(1,3)
b = B(1, 2)
c = C(2, 1)
d = D(2, 2)
```

(2018s2 Q32) 191. What does a.a2(2, 1) return?

a) -1

b) 0

c) 2

d) 5

(2018s2 Q33) 192. What does b.a1(1, 1) return?

a) 2

b) 4

c) 6

d) 8

(2018s2 Q34) 193. What does c.a1(2,2) return?

a) 4

b) 5

c) 6

d) 7

(2018s2 Q35) 194. What does d.a1(1, 1) return?

a) 2

b) 3

c) 4

d) 5

(2018s2 Q36) 195. What does d.a2(2, 1) return?

a) 0

b) 2

c) 4

d) 6

(2018s1 Q32-36)

196-200. The next five questions refer to the following class definitions.

Python

```python
class A(object) :
    def __init__(self, x) :
        self._x = x

    def m1(self, x) :
        return self.m2(x) * 2

    def m2(self, x) :
        return x + 1

class B(A) :
    def m2(self, y) :
        return self._x + y

class C(B) :
    def __init__(self, x, y) :
        super().__init__(x)
        self._y = y

    def m1(self, x) :
        return self._x - self._y
class D(B) :
    def __init__(self, x, y) :
        super().__init__(x)
        self._x += y
        self._y = y

    def m1(self, y)  :
        return self._y - y

    def m2(self, x) :
        return super().m2(x) + x

a = A(3)
b = B(2)
c = C(2, 4)
d = D(1, 3)
```

(2018s1 Q32) 196. What does a.m1(2) return?

a) 2

b) 4

c) 5

d) 6

(2018s1 Q33) 197. What does b.m1(3) return?

a) 4

b) 5

c) 6

d) 10

(2018s1 Q34) 198. What does c.m2(3) return?

a) 3

b) 4

c) 5

d) 6

(2018s1 Q35) 199. What does d.m1(2) return?

a) 0

b) 1

c) 5

d) 6

(2018s1 Q36) 200. What does d.m2(2) return?

a) 5

b) 6

c) 7

d) 8

(2019s1 Q32-35)

201-204. The next four questions refer to the following class definitions.

Python

```python
class A :
    def __init__(self, x) :
        self._x = x

    def f(self, x) :
        return self.g(x) + 1

    def g(self, x) :
        return x * x

class B(A) :
    def g(self, y) :
        return self._x * y

class C(B) :
    def __init__(self, x, y) :
        super().__init__(x)
        self._y = y

    def f(self, x) :
        return x * self._y

class D(B) :
    def __init__(self, x, y) :
        super().__init__(x)
        self._x -= y
        self._y = y

    def f(self, x) :
        return super().f(x) * x

    def g(self, y)  :
        return self._y * y

a = A(4)
b = B(2)
c = C(4, 3)
d = D(4, 1)
```

(2019s1 Q32) 201. What does a.g(2) return?

a) 2

b) 3

c) 4

d) 16

(2019s1 Q33) 202. What does b.f(3) return?

a) 7

b) 9

c) 10

d) 13

(2019s1 Q34) 203. What does c.g(2) return?

a) 4

b) 6

c) 8

d) 9

(2019s1 Q35) 204. What does d.f(2) return?

a) 2

b) 6

c) 8

d) 10

(2019s2 Q32-36)

205-209. The next five questions refer to the following class definitions.

Python

```python
class A(object) :
    def __init__(self, x) :
        self._x = x
    def m1(self, x) :
        return self.m2(x) * 2
    def m2(self, x) :
        return x + 1

class B(A) :
    def m2(self, y) :
        return self._x + y

class C(B) :
    def __init__(self, x, y) :
        super().__init__(x)
        self._y = y
    def m1(self, x) :
        return self._x - self._y

class D(B) :
    def __init__(self, x, y) :
        super().__init__(x)
        self._x += y
        self._y = y
    def m1(self, y)  :
        return self._y - y
    def m2(self, x) :
        return super().m2(x) + x



a = A(1)
b = B(2)
c = C(2, 3)
d = D(2, 1)
```

(2019s2 Q32) 205. What does a.m1(2) return?

a) 2

b) 4

c) 5

d) 6

e) None of the above

(2019s2 Q33) 206. What does b.m1(3) return?

a) 4

b) 6

c) 8

d) 10

e) None of the above

(2019s2 Q34) 207. What does c.m2(3) return?

a) 3

b) 4

c) 5

d) 6

e) None of the above

(2019s2 Q35) 208. What does d.m1(2) return?

a) -2

b) -1

c) 1

d) 2

e) None of the above

(2019s2 Q36) 209. What does d.m2(2) return?

a) 5

b) 6

c) 7

d) 8

e) None of the above

(2017s1 Q27-31)

210-214. The next five questions refer to the following class definitions.

Python

```python
class A :
    def __init__(self, x) :
        self.x = x

    def f(self, x) :
        return self.g(x) - 1

    def g(self, x) :
        return 2*x

class B(A) :
    def g(self, y) :
        return self.x + y

class C(B) :
    def __init__(self, x, y) :
        super().__init__(x)
        self.y = y

    def f(self, x) :
        return self.x + self.y


class D(B) :
    def __init__(self, x, y) :
        super().__init__(x)
        self.x += y
        self.y = y

    def g(self, y)  :
        return self.y + y

    def f(self, x) :
        return super().f(x) - x


a = A(3)
b = B(2)
c = C(2, 4)
d = D(1, 3)
```

(2017s1 Q27) 210. What does a.g(2) return?

a) 2

b) 3

c) 4

d) 5

(2017s1 Q28) 211. What does a.f(2) return?

a) 2

b) 3

c) 4

d) 5

(2017s1 Q29) 212. What does c.g(3) return?

a) 2

b) 3

c) 4

d) 5

(2017s1 Q30) 213. What does b.f(3) return?

a) 2

b) 3

c) 4

d) 5

(2017s1 Q31) 214. What does d.f(2) return?

a) 2

b) 3

c) 4

d) 5

The next four questions refer to the following class definitions and object instantiations.

Python

```python
class A:
    def __init__(self, x: int):
        self._x = x

    def f(self, a: int) -> int:
        return self.g(a) + self._x

    def g(self, a: int) -> int:
        return a * 2


class B(A):
    def g(self, a: int) -> int:
        return self._x * a

    def h(self, a: int) -> int:
        return super().g(a)


class C(B):
    def __init__(self, a: int, b: int):
        super().__init__(a)
        self._y = b

    def f(self, a: int) -> int:
        return self.h(self._y) + a


a = A(2)
b = B(3)
c = C(4, 6)
```

(2021s1 Q33) 33. What does a.f(2) return?

a) 4

b) 6

c) 8

d) 10

e) Error

(2021s1 Q34) 34. What does b.f(3) return?

a) 6

b) 9

c) 12

d) 15

e) Error

(2021s1 Q35) 35. What does b.h(4) return?

a) 4

b) 8

c) 11

d) 12

e) Error

(2021s1 Q36) 36. What does c.f(5) return?

a) 14

b) 15

c) 17

d) 29

e) Error

函数综合

(2015s1 Q14-Q16)

215-217. The next 3 questions refer to the following definition. Recall that a // b is integer division.

Python

```python
def md(x):
    a, b = x
    a, b = a // b, a % b
    return (a,b)
```

(2015s1 Q14) 215. What is the value of n after the following is evaluated?

n = md(md((20,3)))

(a) (0, 0)

(b) (3, 0)

(c) (3, 1)

(d) (6, 2)

(e) Error

(2015s1 Q15) 216. What is the value of n after the following is evaluated?

n = md(md((30,2)))

(a) (0, 0)

(b) (3, 0)

(c) (3, 1)

(d) (6, 2)

(e) Error

(2015s1 Q16) 217. What is the value of n after the following is evaluated?

n = md(md((3,20)))

(a) (0, 0)

(b) (3, 0)

(c) (3, 1)

(d) (6, 2)

(e) Error

(2015s1 Q17-Q20)

218-221. The next 4 questions refer to the following definition.

Python

```python
def fi(xs, n, m):
    s = xs[n]
    r = [s]
    while n < m:
        if xs[n] > s:
            s = xs[n]
            r.append(s)
        n += 1
    return r
```

(2015s1 Q17) 218. What is the value of x after the following is evaluated?

x = fi([2,6,7,5,3,1], 2, 7)

(a) []

(b) [7]

(c) [5, 3, 1]

(d) [7, 5, 3, 1]

(e) Error

(2015s1 Q18) 219. What is the value of x after the following is evaluated?

x = fi([2,6,7,5,3,1], 2, -1)

(a) []

(b) [7]

(c) [5, 3, 1]

(d) [7, 5, 3, 1]

(e) Error

(2015s1 Q19) 220. What is the value of x after the following is evaluated?

x = fi([2,6,6,8,3,1], 0, 5)

(a) []

(b) [2]

(c) [2, 6, 8]

(d) [4, 6, 6, 8]

(e) Error

(2015s1 Q20) 221. What is the value of x after the following is evaluated?

x = fi([1, 4, 2, 4, 5], 1, 5)

(a) [4, 2, 4, 5]

(b) [4, 4, 5]

(c) [4, 5]

(d) [5]

(e) Error

(2015s1 Q21-23)

222-224. The next 3 questions refer to the following definition.

Python

```python
def hti(xs, v, h):
    i = h
    inc = 0
    n = len(xs)
    while xs[i] is not None:
        if xs[i] == v:
            return
        inc += 1
        i = (i+inc) % n
    xs[i] = v
```

(2015s1 Q21) 222. What is the result of the following evaluation? In par ticular, if the evaluation does not have an error, what will the value of xs be after the evaluation?

xs = [None, 5, 6, None, 7]

hti(xs, 8, 1)

(a) The evaluation terminates without error with xs == [None, 5, 6, None, 7]

(b) The evaluation terminates without error with xs == [8, 5, 6, None, 7]

(c) The evaluation terminates without error with xs == [None, 5, 6, 8, 7]

(d) The evaluation does not terminate

(e) An IndexError exception is raised.

(2015s1 Q22) 223. What is the result of the following evaluation? In par ticular, if the evaluation does not have an error, what will the value of xs be after the evaluation?

xs = [2, 5, 9, 4, None, None, 7, None]

hti(xs, 11, 0)

(a) The evaluation terminates without error with xs == [2, 5, 9, 4, 11, None, 7, None]

(b) The evaluation terminates without error with xs == [2, 5, 9, 4, None, 11, 7, None]

(c) The evaluation terminates without error with xs == [2, 5, 9, 4, None, None, 7, 11]

(d) The evaluation does not terminate

(e) An IndexError exception is raised.

(2015s1 Q23) 224. What is the result of the following evaluation? In par ticular, if the evaluation does not have an error, what will the value of xs be after the evaluation?

xs = [2, 5, 9, 4, None, None, 7, None]

hti(xs, 11, 3)

(a) The evaluation terminates without error with xs == [2, 5, 9, 4, 11, None, 7, None]

(b) The evaluation terminates without error with xs == [2, 5, 9, 4, None, 11, 7, None]

(c) The evaluation terminates without error with xs == [2, 5, 9, 4, None, None, 7, 11]

(d) The evaluation does not terminate

(e) An IndexError exception is raised.

(2015s1 Q24-26)

225-227. The next 3 questions refer to the following definition that is missing three lines of code. The function get_column_sums below reads data from a CSV (Comma Separated Values) file and returns the list of sums for each column. We assume the file contains rows of floating point numbers separated by commas (and possibly including spaces) and each row has the same number of floats. Below is an example of such a file and the result of applying the function top that file. The following is an example of a data file (values.txt).

```
1.2, 1 , 2.3, 1.4, 0.1

0.7,1.5, 1.2, 2.4, 0.1

2.1,0.7, 1.4, 2.0, 0.1
```

```
>>> get_column_sums(’values.txt’)

>>> [4.0, 3.2, 4.9, 5.8, 0.3]
```

The definition of the get_column_sums function with three missing lines and the result of applying the completed function to the file is given below.

Python

```python
def get_column_sums(filename):
    fd = open(filename, 'r')
    data = []
    for line in fd:
        parts = line.split(',')
        line_data = []
        for p in parts:
                ## line 1 ##
        data.append(line_data)
    column_sums = []
    for index in range(len(data[0])):
        colsum = 0
        for row in range(len(data)):
            ## line 2 ##
        ## line 3 ##
    return column_sums
```

(2015s1 Q24) 225. What is the required code for ## line 1 ##?

(a) line_data.append(p)

(b) line_data.append(float(p.strip()))

(c) line_data.extend(p)

(d) line_data.extend(float(p.strip()))

(e) More than one of the above is correct.

(2015s1 Q25) 226. What is the required code for ## line 2 ##?

(a) colsum = data[index][row]

(b) colsum = data[row][index]

(c) colsum += data[index][row]

(d) colsum += data[row][index]

(e) More than one of the above is correct.

(2015s1 Q26) 227. What is the required code for ## line 3 ##?

(a) column_sums.append(colsum)

(b) column_sums.extend(colsum)

(c) column_sums + colsum

(d) column_sums + [colsum]

(e) More than one of the above is correct.

(2016s1 Q14-16)

228-230. The next 3 questions refer to the following definition.

Python

```python
def md(x, y):
    a, b = x // y, x % y
    return (a, b)
```

(2016s1 Q14) 228. What is the value of n after the following is evaluated?

n = md(md(20,3))

(a) (0, 0)

(b) (3, 0)

(c) (3, 1)

(d) (6, 2)

(e) Error

(2016s1 Q15) 229. What is the value of n after the following is evaluated?

```
m1,m2 = md(3,20)
n = md(m1, m2)
```

(a) (0, 0)

(b) (3, 0)

(c) (3, 1)

(d) (6, 2)

(e) Error

(2016s1 Q16) 230. What is the value of n after the following is evaluated?

```
m1, m2 = md((3,20))
n = md((m1, m2))
```

(a) (0, 0)

(b) (3, 0)

(c) (3, 1)

(d) (6, 2)

(e) Error

(2016s1 Q17-20)

231-234. The next 4 questions refer to the following definition.

Python

```python
def fd(xs, n, m):
    s = xs[n]
    n += 1
    r = []
    while n < m:
        if xs[n] != s:
            r.append((s, xs[n]))
            s = xs[n]
        n += 1
    return r
```

(2016s1 Q17) 231. What is the value of x after the following is evaluated?

x = fd(’ ATAA__TT’ , 0, 8)

(a) []

(b) [(’ A’ ,’ A’), (’ _’ ,’ _’), (’ T’ ,’ T’)]

(c) [(’ A’ ,’ T’), (’ T’ ,’ A’), (’ A’ ,’ _’), (’ _’ ,’ T’)]

(d) [(’ A’ ,’ T’), (’ T’ ,’ A’), (’ _’ ,’ _’), (’ T’ ,’ T’)]

(e) Error

(2016s1 Q18) 232. What is the value of x after the following is evaluated?

x = fd(’ ATAA__TT’ , 0, -1)

(a) []

(b) [(’ A’ ,’ A’), (’ _’ ,’ _’), (’ T’ ,’ T’)]

(c) [(’ A’ ,’ T’), (’ T’ ,’ A’), (’ A’ ,’ _’), (’ _’ ,’ T’)]

(d) [(’ A’ ,’ T’), (’ T’ ,’ A’), (’ _’ ,’ _’), (’ T’ ,’ T’)]

(e) Error

(2016s1 Q19) 233. What is the value of x after the following is evaluated?

x = fd(’ ATAA__TT’ , 2, 7)

(a) []

(b) [(’ A’ ,’ _’), (’ _’ ,’ T’)]

(c) [(’ A’ ,’ A’), (’ _’ ,’ _’), (’ T’ ,’ T’)]

(d) [(’ T’ ,’ A’), (’ _’ ,’ _’), (’ T’ ,’ T’)]

(e) Error

(2016s1 Q20) 234. What is the value of x after the following is evaluated?

x = fd(’ ATAA__TT’ , 2, 4)

(a) []

(b) [(’ A’ ,’ A’)]

(c) [(’ A’ ,’ _’)]

(d) [(’ A’ ,’ A’), (’ A’ ,’ _’)]

(e) Error

(2016s1 Q21-23)

235-237. The next 3 questions refer to the following definition.

Python

```python
def hti(xs, v, h):
    i = h
    inc = 0
    n = len(xs)
    while xs[i] is not None:
        if xs[i] == v:
            return
        inc += 1
        i = (i+inc) % n
    xs[i] = v
```

(2016s1 Q21) 235. What is the result of the following evaluation? In par ticular, if the evaluation does not have an error, what will the value of xs be after the evaluation?

xs = [4, None, 5, 6, None, 7, None, 8]

hti(xs, 5, 7)

(a) The evaluation terminates without error with xs == [4, 5, 5, 6, None, 7, None, 8]

(b) The evaluation terminates without error with xs == [4, None, 5, 6, None, 7, 5, 8]

(c) The evaluation terminates without error with xs == [4, None, 5, 6, None, 7, None, 8]

(d) The evaluation does not terminate

(e) An IndexError exception is raised.

(2016s1 Q22) 236. What is the result of the following evaluation? In par ticular, if the evaluation does not have an error, what will the value of xs be after the evaluation?

xs = [4, None, 5, 6, None, 7, None, 8]

hti(xs, 6, 7)

(a) The evaluation terminates without error with xs == [4, None, 5, 6, None, 7, None, 8]

(b) The evaluation terminates without error with xs == [4, 6, 5, 6, None, 7, None, 8]

(c) The evaluation terminates without error with xs == [4, None, 5, 6, None, 7, 6, 8]

(d) The evaluation does not terminate

(e) An IndexError exception is raised.

(2016s1 Q23) 237. What is the result of the following evaluation? In par ticular, if the evaluation does not have an error, what will the value of xs be after the evaluation?

xs = [4, None, 5, 6, None, 7, 8]

hti(xs, 6, 6)

(a) The evaluation terminates without error with xs == [4, None, 5, 6, None, 7, 8]

(b) The evaluation terminates without error with xs == [4, 6, 5, 6, None, 7, 8]

(c) The evaluation terminates without error with xs == [4, None, 5, 6, 6, 7, 8]

(d) The evaluation does not terminate

(e) An IndexError exception is raised.

(2016s2 Q21-23)

238-240. The next 3 questions refer to the following definition.

Python

```python
def m(x):
      a,b = x
      if a > b:
           return (b, a*a-b*b)
      elif a < b:
           return (a, b*b-a*a)
      else:
           return (a,b)
```

(2016s2 Q21) 238. What is the value of n after the following is evaluated? n = m(5,2)

(a) (6, -3)

(b) (4, 7)

(c) (6, 2)

(d) (3, 3)

(e) Error

(2016s2 Q22) 239. What is the value of n after the following is evaluated? n = m((4,3))

(a) (6, -4)

(b) (3, 7)

(c) (7, 2)

(d) (3, 6)

(e) Error

(2016s2 Q23) 240. What is the value of n after the following is evaluated? n = m(m((3,2)))

(a) (4, 16)

(b) (4, 18)

(c) (2, 21)

(d) (3, 19)

(e) None of the above

(2016s2 Q28-30)

241-243. The next 3 questions refer to the following definition.

Python

```python
def f(xs):
    i = 0
    r = []
    while i >= 0 and i < len(xs):
        d,v = xs[i]
        r.append(v)
        i += d
    return r
```

(2016s2 Q28) 241. What is the value of zs after the following is evaluated?

zs = f([(1,'l'),(2,'m'),(3,'n'), (-1,'o')])

(a) [’ l’ ,’ m’ ,’ n’ ,’ o’]

(b) [’ l’ ,’ m’ ,’ o’ ,’ n’]

(c) [’ l’ ,’ m’ ,’ n’]

(d) Non-terminating execution (possibly resulting in an out of memory error)

(e) Error (other than non-termination/out of memory)

(2016s2 Q29) 242. What is the value of zs after the following is evaluated?

zs = f([(1,’ l’),(-2,’ m’),(3,’ n’), (-2,’ o’)])

(a) [’ l’ ,’ m’ ,’ n’ ,’ o’ ,’ n’]

(b) [’ l’ ,’ m,’ n’]

(c) [’ l’ ,’ m’]

(d) Non-terminating execution (possibly resulting in an out of memory error)

(e) Error (other than non-termination/out of memory)

(2016s2 Q30) 243. What is the value of zs after the following is evaluated?

zs = f([(1,’ l’),(-1,’ m’),(4,’ n’), (-2,’ o’)])

(a) [’ l’ ,’ m’ ,’ n’ ,’ o’ ,’ n’]

(b) [’ l’ ,’ m’ ,’ o’ ,’ n’]

(c) [’ l’ ,’ m’ ,’ n’]

(d) Non-terminating execution (possibly resulting in an out of memory error)

(e) Error (other than non-termination/out of memory)

(2017s2 Q28-30)

244-246. The next 3 questions refer to the following definition.

Python

```python
def f(xs):
      i = 0
      r = []
      while i >= 0 and i < len(xs):
            d,v = xs[i]
            r.append(v)
            i += d
      return r
```

(2017s2 Q28) 244. What is the value of zs after the following is evaluated?

zs = f([(1,'l'),(2,'m'),(3,'n'), (-1,'o')])

(a) [’ l’ ,’ m’ ,’ o’]

(b) [’ l’ ,’ m ’ ,’ o’ ,’ n’]

(c) [’ l’ ,’ m ’ ,’ n’]

(d) Non-terminating execution (possibly resulting in an out of memory error)

(e) Error (other than non-termination/out of memory)

(2017s2 Q29) 245. What is the value of zs after the following is evaluated?

zs = f([(1,’ l’),(-2,’ m’),(3,’ n’), (-2,’ o’)])

(a) [’ l’ ,’ m’ ,’ n’ ,’ o’ ,’ n’]

(b) [’ l’ ,’ m,’ n’]

(c) [’ l’ ,’ m’]

(d) Non-terminating execution (possibly resulting in an out of memory error)

(e) Error (other than non-termination/out of memory)

(2017s2 Q30) 246. What is the value of zs after the following is evaluated?

zs = f([(1,’ l’),(-1,’ m’),(4,’ n’), (-2,’ o’)])

(a) [’ l’ ,’ m’ ,’ n’ ,’ o’ ,’ n’]

(b) [’ l’ ,’ m’ ,’ o’ ,’ n’]

(c) [’ l’ ,’ m’ ,’ n’]

(d) Non-terminating execution (possibly resulting in an out of memory error)

(e) Error (other than non-termination/out of memory)

(2017s2 Q24-26)

247-249. The next 3 questions refer to the following definition that is missing three lines of code. This function loads information contained in a data file into a dictionary. The

data file contains ’ major keys’ (in square brackets) each on a line by itself, followed by one or more lines of the form minor key = value. For example, the contents of the data file, values.txt, is given below.

```
[Austria]


Time zone = 3:00
Capital = Vienna

[Canada]


Time zone = 7:00
Capital = Ottawa
```

The definition of the function, load_data, and the desired result of applying it to the above file is given below.

Python

```python
def load_data(data_file):
    """Return dictionary of the information contained in the file data_file.
    load_data(string) -> dict(string:dict(string:string))
    Precondition: the first non-blank line is a ’major key’
    """
    inf = open(data_file, 'rU')
    lines = inf.readlines()
    inf.close()
    data_dict = {}
    for line in lines :
        if line.strip() == '': # ignore blank lines
            ## line 1 ##
        elif line.startswith('['): # major key
            ## line 2 ##
            major_value = {}
            data_dict[major] = major_value
        else:
            # minor key/value
            minor = line.split('=', 1)
            ## line 3 ##
    return data_dict
```

Python

```python
>>> load_data(’values.txt’)
>>> {'Austria': {'Time zone': '3:00', 'Capital': 'Vienna'}, 'Canada': {'Time zone': '7:00', 'Capital':
'Ottawa'}}
```

(2017s2 Q24) 247. What is the required code for ## line 1 ##?

(a) break

(b) pass

(c) data_dict = None

(d) major_value = None

(e) None of the above

(2017s2 Q25) 248. What is the required code for ## line 2 ##?

(a) major = line.split(’]’ ,1)[0][:-1]

(b) major = line.split(’]’ ,1)[:-1]

(c) major = line.split(’]’ ,1)[0][1:]

(d) major = line.split(’]’ ,1)[1:]

(e) None of the above

(2017s2 Q26) 249. What is the required code for ## line 3 ##? Recall that a semi-colon allows you to write two or more statements on one line.

(a) major_value[minor[0].strip()] = minor[1].strip()

(b) minor[1].strip() = major_value[minor[0].strip()]

(c) major_value[minor[1].strip()] = minor[0].strip()

(d) minor[0].strip() = major_value[minor[1].strip()]

(e) None of the above

(2017s2 Q21-23)

250-252. The next 3 questions refer to the following definition.

Python

```python
def m(x):
      a,b = x
      if a > b:
           return (b, a*a+b*b)
      elif a < b:
           return (a, b*b+a*a)
      else:
           return (a,b)
```

(2017s2 Q21) 250. What is the value of n after the following is evaluated? n = m(2,1)

(a) (2, -3)

(b) (3, 5)

(c) (4, 2)

(d) (2, 1)

(e) Error

(2017s2 Q22) 251. What is the value of n after the following is evaluated? n = m((4,3))

(a) (2, -14)

(b) (3, 25)

(c) (4, 10)

(d) (7, 28)

(e) Error

(2017s2 Q23) 252. What is the value of n after the following is evaluated? n = m(m((1,2)))

(a) (1, 26)

(b) (2, 18)

(c) (13, 31)

(d) (3, 23)

(e) None of the above

(2015s2 Q18-20)

253-255. The next 3 questions refer to the following definition.

Python

```
def m(x):
      a,b = x
      if a > b:
           return (b, a*a-b*b)
      elif a < b:
           return (a, b*b-a*a)
      else:
           return (a,b)
```

(2015s2 Q18) 253. What is the value of n after the following is evaluated? n = m(2,3)

(a) (7, -5)

(b) (3, 7)

(c) (7, 2)

(d) (2, 5)

(e) Error

(2015s2 Q19) 254. What is the value of n after the following is evaluated? n = m((3,2))

(a) (7, -5)

(b) (3, 7)

(c) (7, 2)

(d) (2, 5)

(e) Error

(2015s2 Q20) 255. What is the value of n after the following is evaluated? n = m(m((2,1)))

(a) (4, 12)

(b) (4, 16)

(c) (2, 2)

(d) (1, 8)

(e) Error

(2015s2 Q21-24)

256-259. The next 4 questions refer to the following definition.

Python

```python
def function1(xs,n,m,p):
      t = []
      s = p/abs(p)
      # s is the sign of p (1 or -1)
      while s*(m-n) > 0:
             t.append(xs[n])
              n += p
      return t
```

(2015s2 Q21) 256. What is the value of x after the following is evaluated?

x = function1([‘a’ , ‘b’ , ‘c’ , ‘d’ , ‘e’], 1, 4, 1)

(a) []

(b) [‘a’ , ‘b’ , ‘c’]

(c) [‘b’ , ‘c’ , ‘d’]

(d) [‘a’ , ‘b’ , ‘c’ , ‘d’]

(e) Error

(2015s2 Q22) 257. What is the value of x after the following is evaluated?

x = function1([‘a’ , ‘b’ , ‘c’ , ‘d’ , ‘e’], 1, 4, -1)

(a) []

(b) [‘a’ , ‘b’ , ‘c’]

(c) [‘b’ , ‘c’ , ‘d’]

(d) [‘a’ , ‘b’ , ‘c’ , ‘d’]

(e) Error

(2015s2 Q23) 258. What is the value of x after the following is evaluated?

x = function1([‘a’ , ‘b’ , ‘c’ , ‘d’ , ‘e’], -1, -4, -1)

(a) []

(b) [‘e’ , ‘d’ , ‘c’]

(c) [‘b’ , ‘c’ , ‘d’]

(d) [‘a’ , ‘b’ , ‘c’ , ‘d’]

(e) Error

(2015s2 Q24) 259. What is the value of x after the following is evaluated?

x = function1([‘a’ , ‘b’ , ‘c’ , ‘d’ , ‘e’], 1, 5, 3)

(a) []

(b) [‘e’ , ‘d’ , ‘c’]

(c) [‘a’ , ‘d’]

(d) [‘b’ , ‘e’]

(e) Error

(2015s2 Q25-27)

260-262. The next 3 questions refer to the following definition.

Python

```python
def f(xs):
      i = 0
      r = []
      while i >= 0 and i < len(xs):
            d,v = xs[i]
            r.append(v)
            i += d
      return r
```

(2015s2 Q25) 260. What is the value of zs after the following is evaluated?

zs = f([(1,'d'),(2,'e'),(3,'f'), (-1,'g')])

(a) [’ d’ ,’ e’ ,’ f’ ,’ g’]

(b) [’ d’ ,’ e’ ,’ g’ ,’ f’]

(c) [’ d’ ,’ e’ ,’ f’]

(d) Non-terminating execution (possibly resulting in an out of memory error)

(e) Error (other than non-termination/out of memory)

(2015s2 Q26) 261. What is the value of zs after the following is evaluated?

zs = f([(1,’ d’),(-2,’ e’),(3,’ f’), (-2,’ g’)])

(a) [’ d’ ,’ e’ ,’ f’ ,’ g’ ,’ f’]

(b) [’ d’ ,’ e’ ,’ f’]

(c) [’ d’ ,’ e’]

(d) Non-terminating execution (possibly resulting in an out of memory error)

(e) Error (other than non-termination/out of memory)

(2015s2 Q27) 262. What is the value of zs after the following is evaluated?

zs = f([(1,’ d’),(-1,’ e’),(4,’ f’), (-2,’ g’)])

(a) [’ d’ ,’ e’ ,’ f’ ,’ g’ ,’ f’]

(b) [’ d’ ,’ e’ ,’ g’ ,’ f’]

(c) [’ d’ ,’ e’ ,’ f’]

(d) Non-terminating execution (possibly resulting in an out of memory error)

(e) Error (other than non-termination/out of memory)

(2017s1 Q22-23)

263-264. The next two questions refer to the following function definition.

Python

```python
def get_days(years) :
    total_days = 0
    while years >= 0 :
        total_days += 365
        years -= 1
    return total_days
```

(2017s1 Q22) 263. When the following code is executed, what, if any, error will be thrown?

Python

```python
years = input("How many years to convert to days? ")
days = get_days(years)
print("You entered ", years, "years.")
print("That is {} days.".format(days))
```

a) ValueError

b) NameError

c) TypeError

d) No error will be thrown.

(2017s1 Q23) 264. What will the following function call return? (If you determined that an error would be thrown in the previous question, assume that it has been fixed.)

get_days(2)

a) 0

b) 365

c) 730

d) 1095

(2017s1 Q11) 265. The following function outputs the power given the voltage (as a float) and the current (as a float).

Python

```python
def power(voltage, current) :
    print(str(voltage * current) + " W")
```

What is the return type of this function?

a) str

b) None

c) float

d) int

(2017s1 Q18) 266. For the following block of code:

Python

```python
words = ["pick", "an", "answer"]
print(words[0])
print(len(words[0]))
print(words[1])
print(len(words[1]))
print(words[2])
print(len(words[2]))
```

Which of the following programming constructs would best simplify the above code?

a) an if statement

b) a function

c) a class

d) a loop

(2017s1 Q19) 267. For the following block of code:

Python

```python
names = ["John", "Marsha", "Bob", "Petunia", "Willy"]
scores = [90, 80, 100, 99, 65]
genders = ["male", "female", "male", "female", "other"]
heights = ["tall", "medium", "medium", "tall", "short"]
preferences = [("male", "tall"), ("male", "tall"),
               ("female", "short"), ("female", "medium"),
               ("other", "short")]
```

Which of the following programming constructs would be best suited to making the above code more structured and maintainable?

a) an if statement

b) a function

c) a class

d) a loop

(2017s1 Q14) 268. What will be returned at the end of this function, assuming count is an int?

Python

```python
def test(count) :
    x = True
    while count > 0  :
        if count > 100 :
            x = True
        else :
            x = False
        count -= 1
    return x
```

a) True if count is less than or equal to zero, otherwise False

b) False if count is less than or equal to zero, otherwise True

c) True if count is in the range of 1 to 100, otherwise False

d) False if count is in the range of 1 to 100, otherwise True

(2017s1 Q12) 269. If you wished to validate input to guarantee that a user only entered one of the following values: 'a', 'b', 'c' or 'd', based on the following input statement:

value = input("Enter one of: 'a', 'b', 'c' or 'd' ")

Which of the following if statements would correctly test that the input was valid?

a) if value == ("a" or "b" or "c" or "d") :

b) if value in "abcd" :

c) if value not in "abcd" :

d) if value in ("a", "b", "c", "d") :

(2019s1 Q20) 270. What is output after the following code is executed:

Python

```python
def f2(a, b) :
    if b == 0:
        raise ValueError("Cannot be '0'.")
    return a / b

def f1(a, b) :
    return f2(a, b)

x = 1
y = 0
try :
    print("Answer is", f1(x, y))
except ValueError as e:
    print(str(e))

```

a) Answer is 0.0

b) Answer is 1.0

c) Cannot be '0'.

d) There is no output because the ZeroDivisionError was not handled by an except clause.

e) There is no output as the program crashes because the error was not handled in function f1.

(2019s2 Q30-31)

271-272. The next 2 questions refer to the following definition.

Python

```
def m(x):
      a,b = x
      if a > b:
           return (b, a+b)
      elif a < b:
           return (a, b*b+a*a)
      else:
           return (a,b)
```

(2019s2 Q30) 271. What is the value of n after the following is evaluated?

n = m(3,4)

a) (1, -3)

b) (4, 6)

c) (3, 2)

d) (3, 1)

e) Error

(2019s2 Q31) 272. What is the value of n after the following is evaluated?

n = m((3,2))

a) (2, 5)

b) (3, 41)

c) (3, 18)

d) (2, 71)

e) Error

(2019s1 Q21) 273. For the following block of code:

Python

```
options = {'a': "Option A",
           'b': "Option B",
           'c': "Option C",
           'd': "Option D",
           'e': "Option D"}
print('a)', options['a'])
print('b)', options['b'])
print('c)', options['c'])
print('d)', options['d'])
print('e)', options['e'])
```

Which of the following programming constructs would best simplify the above code?

a) for loop

b) while loop

c) if statement

d) function

e) class

(2019s1 Q22) 274. For the following block of code:

Python

```python
daily_high_temperature = [29, 30, 27, 32, 31, 28, 33]
daily_low_temperature = [17, 20, 15, 19, 21, 17, 19]

total = 0
for temp in daily_high_temperature :
    total += temp
print("The average high temperature was",
      total / len(daily_high_temperature))

total = 0
for temp in daily_low_temperature :
    total += temp
print("The average low temperature was",
      total / len(daily_low_temperature))
```

Which of the following programming constructs would best simplify the above code?

a) tuple

b) dictionary

c) if statement

d) while loop

e) function

(2019s1 Q16) 275. What is output after the following code is executed?

Python

```python
daily_high_temperature = [29, 30, 27, 32, 31, 28, 33]
yesterday_temperature = 30
hotter = 0
colder = 0

for temperature in daily_high_temperature :
    if yesterday_temperature < temperature :
        hotter += 1
    elif yesterday_temperature > temperature :
        colder += 1

if hotter > colder :
    print("getting hotter")
elif colder > hotter :
    print("getting colder")
else :
    print("no change")
```

a) getting hotter

b) getting colder

c) no change

d) There is no output

e) Error

(2019s1 Q15) 276. What is output after the following code is executed?

```python

x = 100
if x > 1 :
    print("positive")
elif x > 10 :
    print("large positive")
elif x == 0 :
    print("zero")
else :
    print("negative")
```

a) positive

b) large positive

c) positive

large positive

d) negative

e) Error

(2019s1 Q14) 277. What is output after the following code is executed?

Python

```python
x = 0
stars = '*'
while x > 0 :
    print(stars)
    stars += '*'
    x -= 1
```

a) *

b) A blank line

c) There is no output

d) An infinite number of *’ s

e) Error

(2018s2 Q19) 278. Which of the following descriptions best describe the purpose of this function?

Python

```python
def func() :
    t = 0
    r = int(input('Please input an integer: '))
    while r != 0 :
        if r % 2 == 1 :
            t += r
        r = int(input('Please input an integer: '))
    return t
```

a) It does not do anything as the body of the while loop

never executes.

b) It is an infinite loop as the while loop condition can

never be false.

c) It returns the sum of all integers entered.

d) It returns the sum of all odd integers entered.

e) It returns the sum of all even integers entered.

(2019s2 Q20) 279. Which of the following descriptions best describe the purpose of the code below?

Python

```python
n = int(input("Enter a number:"))
total = 1
while(n > 0):
    proc_num = n % 10
    total=total * proc_num
    n=n // 10
print(total)

```

a) It multiplies together every 10th number entered and

prints the result.

b) It multiplies together all the numbers between 1 and 10

and prints the result

c) It multiplies all digits in a number and prints the

result

d) It does none of the above

(2019s1 Q17) 280. Assuming that the parameter lst is a list of integer values, which of the following descriptions best describe the purpose of this function?

Python

```python
def f(lst) :
    a = 0
    b = 0
    for x in lst :
        if x % 2 == 0 :
            a += 1
        else :
            b += 1
    return a, b
```

a) It returns the average of all even integers and all odd integers in the list.

b) It returns the sum of all even integers and all odd integers in the list.

c) It returns how many even and odd integers were in the list.

d) It raises an error as a function cannot return more than one value.

(2019s2 Q19) 281. Which of the following descriptions best describe the purpose of the following function?

Python

```python
def f() :
    k = 0
    g = int(input('Please input an integer: '))
    while g != 0 :
        if g % 2 != 0 :
            k += g
        g = int(input('Please input an integer: '))
    return k
```

a) It is an infinite loop as the while loop condition can

never be false.

b) It returns the sum of every second integer entered.

c) It returns the sum of all odd integers entered.

d) It returns the sum of all even integers entered.

(2018s2 Q22-25)

282-285. The next 4 questions refer to the following definition.

Python

```python
def function1(xs,n,m,p):
    t = []
    s = p/abs(p)
    # s is the sign of p (1 or -1)
    while s*(m-n) > 0:
        t.extend(xs[n])
        n += p
    return t
```

(2018s2 Q22) 282. What is the value of x after the following is evaluated?

x = function1(['d', 'e', 'f', 'g', 'h'], 2, 4, 1)

a) []

b) ['f', 'g']

c) ['f', ['g', 'h']]

d) ['f', 'g', ['h', 'd']]

e) Error

(2018s2 Q23) 283. What is the value of x after the following is evaluated?

x = function1(['d', 'e', 'f', 'g', 'h'], 2, 6, 1)

a) []

b) ['f', 'g', ['h', 'd']]

c) ['f', 'g', 'h', 'd']

d) ['f', 'g', 'h', 'd', 'e']

e) Error

(2018s2 Q24) 284. What is the value of x after the following is evaluated?

x = function1(['d', 'e', 'f', 'g', 'h'], -1, -4, 2)

a) []

b) ['g', 'h']

c) ['g', ['h']]

d) ['h', 'f']

e) Error

(2018s2 Q25) 285. What is the value of x after the following is evaluated?

x = function1(['d', 'e', 'f', 'g', 'h'], 3, 3, 4)

a) []

b) ['e', 'g']

c) ['e', 'g', 'f']

d) ['e', 'f', 'g', 'd']

e) Error

(2018s2 Q29-31)

286-288.The next 3 questions refer to the following definition that is missing three lines of code. This function extracts URL information from the body of HTML text as in the example below.

Python

```
>>> text = """
<body>
 <ul>
<li><a href="/future-students">Future Students</a></li>
 <li><a href="/current-students">Current Students</a></li>
</ul>
 </body>
"""
>>> get_urls(text)
 {'Future Students': '/future-students', 'Current Students':
'/current-students'}

```

The definition of the function get_urls is given below.

Python

```python
def get_urls(text):
    """Return a dictionary that associates each URL with the            text for that URL
    get_urls(str) -> dict(str:str)
    Precondition: text is valid HTML """
    d = {}
    pos = 0
    next_pos = text.find("<a href")
    while next_pos != -1:
        ## line 1 ##
        end_tag = text.find('>', next_pos)
        start_tag = text.find('<', end_tag)
        ## line 2 ##
        d[name] = url
        ## line 3 ##
    return d
```

(2018s2 Q29) 286. What is the required code for ## line 1 ##?

a) url = text[next_pos:].split('"', 2)[0]

b) url = text[next_pos:].split('"', 2)[1]

c) url = text[:next_pos].split('"', 2)[0]

d) url = text[:next_pos].split('"', 2)[1]

e) None of the above

(2018s2 Q30) 287. What is the required code for ## line 2 ##?

a) name = text[end_tag:start_tag]

b) name = text[end_tag+1:start_tag]

c) name = text[end_tag:start_tag-1]

d) name = text[end_tag+1:start_tag-1]

e) None of the above

(2018s2 Q31) 288. What is the required code for ## line 3 ##?

a) break

b) end_tag = text.find('>', start_tag)

c) next_pos = text.find("<a href", start_tag)

d) end_tag = text.find('>', next_pos)

e) next_pos = text.find("<a href", next_pos)

(2018s1 Q17) 289. Which of the following descriptions best describe the purpose of th is function?

Python

```python
def f() :
    t = 0
    r = int(input('Please input an integer: '))
    while r != 0 :
        if r % 2 == 0 :
            t += r
        r = int(input('Please input an integer: '))
    return t
```

a) It does not do anything as the body of the while loop never executes.

b) It is an infinite loop as the while loop condition can never be false.

c) It returns the sum of all integers entered.

d) It returns the sum of all odd integers entered.

e) It returns the sum of all even integers entered.

(2018s1 Q22) 290. Consider the following code:

Python

```python
class AnException(Exception) :
    pass

def exceptions(l, a) :
    l.append(9)
    l.pop(a)
    raise AnException()

exceptions([1, 2, 3], 4)
```

Which of the following exceptions, if any, will the code above raise?

a) TypeError

b) IndexError

c) AnException

d) AttributeError

e) No exception will be raised.

(2018s1 Q29-31)

291-293. The next three questions refer to the following function definition, which is missing three lines of code. The function reads raw athlete score data from a file and calculates the athlete’ s result. The following is an example of a data file (scores.txt).

1.1 1.1 1.1 1.1

2 2 2 2

3 3

4.0 4.1 4.2 4.3 4.4 4.5 4.6 4.7 4.8

Each line of the file represents the scores that an athlete achieved in each round of a competition. These scores may be integer or floating point values and are separated by one space. Athletes may have different numbers of scores. The

athlete’ s result for the competition is the average of all of their scores. The results are written to an output file in the same order in which they are read from the input file. The logic assumes that the data in the input file is in the correct format.

The definition of the process function, with three missing lines, is given below.

Python

```python
def process(scores, results) :
    with open(scores, "r") as scores_data, open(results, "w") as results_data:
        for athlete in scores_data:
            athlete = athlete.strip()
            ## line 1 ##
            total = 0
            ## line 2 ##
            ## line 3 ##
            results_data.write(str(result) + '\n')
```

The result of calling the completed function on the file described above, for example by:

process('scores.txt', 'results.txt')

Would result in the following data being saved to results.txt

1.1

2.0

3.0

4.4

When answering questions 30 and 31, assume that the correct code has been implemented from the previous question(s).

(2018s1 Q29) 291. What is the required code for ## line 1 ##?

a) athlete.split(" ")

b) athlete.split(",")

c) athlete_scores = athlete.split(" ")

d) athlete_scores = athlete.split(",")

(2018s1 Q30) 292. What is the required code for ## line 2 ##?

a) for score in athlete :

total += score

b) for score in athlete :

total += float(score)

c) for score in athlete_scores :

total += score

d) for score in athlete_scores :

total += float(score)

(2018s1 Q31) 293. What is the required code for ## line 3 ##?

a) result = total / len(athlete)

b) result = total / len(athlete_scores)

c) result = result / len(athlete)

d) result = result / len(athlete_scores)

(2019s2 Q22-24)

294-296. The next 3 questions refer to the following definition that is missing three lines of code. This function loads information contained in a data file into a dictionary. The data file contains 'major keys' (in square brackets) each on a line by itself, followed by one or more lines of the form minor key = value. For example, the contents of the data file, values.txt, is given below.

[Spain]

Time zone = 3:00

Capital = Madrid

[France]

Time zone = 3:00

Capital = Paris

The definition of the function, load_data, and the desired result of applying it to the above file is given below.

Python

```python
def load_data(data_file):
    """Return dictionary of the information contained in the
    file data_file.
    load_data(string) -> dict(string:dict(string:string))
    Precondition: the first non-blank line is a 'major key'
    """
    inf = open(data_file, 'r')
    lines = inf.readlines()
    inf.close()
    data_dict = {}
    for line in lines :
        if line.strip() == '': # ignore blank lines
            ## line 1 ##
        elif line.startswith('['): # major key
            ## line 2 ##
            major_value = {}
            data_dict[major] = major_value
        else:
            # minor key/value
            minor = line.split('=', 1)
            ## line 3 ##
     return data_dict

>>> load_data('values.txt')
{'Spain': {'Time zone': '3:00', 'Capital': 'Madrid'},
'France': {'Time zone': '3:00', 'Capital': 'Paris'}}
```

(2019s2 Q22) 294. What is the required code for ## line 1 ##?

a) break

b) pass

c) data_dict = None

d) major_value = None

e) None of the above

(2019s2 Q23) 295. What is the required code for ## line 2 ##?

a) major = line.split(']',1)[0][:-1]

b) major = line.split(']',1)[:-1]

c) major = line.split(']',1)[0][1:]

d) major = line.split(']',1)[1:]

e) None of the above

(2019s2 Q24) 296. What is the required code for ## line 3 ##?

a) major_value[minor[0].strip()] = minor[1].strip()

b) minor[1].strip() = major_value[minor[0].strip()]

c) major_value[minor[1].strip()] = minor[0].strip()

d) minor[0].strip() = major_value[minor[1].strip()]

e) None of the above

(2017s1 Q24-26)

297-299. The next three questions (on the following page) refer to the following function definition, which is missing three lines of code. This function reads data from a file and calculates averages. The following is an example of a data file (values.txt).

```
name1 :
1.2
2.3

name2 :

2.4
name3:
1.7

1.9
end:
```

The file is divided into sections with each section starting with a (non-empty) name followed by zero or more spaces followed by a colon. The name of a section is followed by one or more lines containing floating point numbers. Blank lines may appear anywhere in the file. The last line of the file is end:.

The definition of the get_averages function, with three missing lines, is given below.

Python

```python
def get_averages(filename) :
    file = open(filename, 'r')
    averages = {}
    name = None
    for line in file :
        line = line.strip()
        if line == '' :
            ## line 1 ##
        if line.endswith(':') :
            if name is not None :
                ## line 2 ##
            name = line[:-1].strip()
            num = 0
            total = 0.0
        else :
            ## line 3 ##
    file.close()
    return averages
```

The result of calling the completed function on the file described above, for example by:

Python

```python
print(get_averages('values.txt'))
```

Would result in the following being output:

Python

```
{'name1': 1.75, 'name2': 2.4, 'name3': 1.8}
```

(2017s1 Q24) 297. What is the required code for ## line 1 ##?

a) break

b) continue

c) name = None

d) averages[name] = 0

e) More than one of the above is correct.

(2017s1 Q25) 298. What is the required code for ## line 2 ##?

a) name = None

b) averages[name] = 0

c) averages[name] = total / num

d) averages[name] = total / (num + 1)

e) More than one of the above is correct.

(2017s1 Q26) 299. What is the required code for ## line 3 ##? Recall that a semi-colon allows you to write two or more statements on one line.

a) num += 1; total += line

b) num += 1; total += float(line)

c) averages[name] = 0; num = 0; total = 0

d) averages[name] = total / num; num += 1

e) More than one of the above is correct.

(2019s1 Q25-27)

300-302. The next three questions refer to the following function definition, which is missing three lines of code. The function reads raw wind speed data from a file and calculates the average and maximum wind speeds for each day. The following is an example of a data file (wind_speed.csv).

12,15,8,24,2,15

22,12,19,29,16,13

11,5,7,3,5,9,2,4,1,3,5,7,12,8,11

Each line of the file contains the wind speed readings collected on a single day. These values may be integer or floating point and are separated by a comma. Each day may have different numbers of readings. The average wind speed for a day is simply the average of all the values on the line . The maximum wind speed for a day is the largest value on the line. The results are written to an output file in the same order in which they are read from the input file. The logic assumes that the data in the input file is in the correct format.

The definition of the process function, with three missing lines, is given below.

Python

```python
def process(wind_speeds, processed_data):
    with open(wind_speeds, "r") as wind_data, \
            open(processed_data, "w") as result_data:
        for day in wind_data:
            day = day.strip()
            wind_speeds = day.split(',')
            ## line 1: Set initial max wind speed ##
            total = 0
            ## line 2: Calculate average and max wind speeds ##
            ## line 3: Update max wind speed ##
            average_wind_speed = total / len(wind_speeds)
            result_data.write(f"{str(average_wind_speed)}," + f"{str(max_wind_speed)}\n")
```

The result of calling the completed function on the file described above, for example by:

process('wind_speed.csv', 'processed_results.csv')

Would result in the following data being saved to processed_results.csv.

```
12.666666666666666,24.0
18.5,29.0
6.2,12.0
```

When answering questions 25 and 27, assume that the correct code has been

implemented from the previous question(s).

(2019s1 Q25) 300. What code is required at ## line 1: Set initial max wind speed. ##?

a) max_wind_speed = wind_speeds

b) max_wind_speed = wind_speeds[0]

c) max_wind_speed = float(wind_speeds)

d) max_wind_speed = float(wind_speeds[0])

(2019s1 Q26) 301. What code is required at ## line 2: Calculate average and max wind speeds ##?

```
a) for wind_speed in day :
       wind_speed = float(wind_speed)
       total += wind_speed
b) for wind_speed in day :
       total += wind_speed
c) for wind_speed in wind_speeds :
       wind_speed = float(wind_speed)
       total += wind_speed
d) for wind_speed in wind_speeds :
       total += wind_speed
```

(2019s1 Q27) 302. What code is required at ## line 3: Update max wind speed ##?

```
a) if wind_speed > max_wind_speed :
       max_wind_speed = wind_speed
b) if wind_speeds[0] > max_wind_speed :
       max_wind_speed = wind_speeds[0]
c) if float(wind_speed) > float(max_wind_speed) :
```

float(max_wind_speed) = float(wind_speed)

d) max_wind_speed = max(wind_speed)

(2020s1 Q17) 16. The following recursive function definition is used in this question and the next one.

```python
def g(x) :
    if x == 1 :
        return 1
    x -=1
    return g(x-1)*x
```

What will the function call g(3) return?

(a) 2

(b) RecursionError will be raised due to

maximum recursion depth being exceeded

(c) 6

(d) 4

(2020s1 Q18) 17. What will the function call g(2) return?

(a) 0

(b) -1

(c) 1

(d) RecursionError will be raised due to maximum

recursion depth being exceeded.

(2020s1 Q29) 28. The next 3 questions refer to the following definition that is missing three lines of code. The function get_column_sums below reads data from a CSV (Comma Separated Values) file and returns the list of sums for each column. We assume the file contains rows of floating point numbers separated by commas (and possibly including spaces) and each row has the same number of floats. Below is an example of such a file and the result of applying the function to that file.The following is an example of a data file (values.txt).

1.2, 1 ,2.3, 1.4, 0.1

0.7,1.5, 1.2, 2.4, 0.1

2.1,0.7, 1.4, 2.0, 0.1

>>> get_column_sums('values.txt')

>>> [4.0, 3.2, 4.9, 5.8, 0.3]

The definition of the get_column_sums function with three missing lines and the result of applying the completed function to the file is given below.

Python

```python
def get_column_sums(filename):
    fd = open(filename, 'r')
    data = []
    for line in fd:
        parts = line.split(',')
        line_data = []
        for p in parts:
            ## line 1 ##
        data.append(line_data)
    column_sums = []
    for index in range(len(data[0])):
        colsum = 0
        for row in range(len(data)):
            ## line 2 ##
        ## line 3 ##
    return column_sums
```

What is the required code for ## line 1 ##?

(a) line_data.append(p)

(b) line_data.append(float(p.strip()))

(c) line_data.extend(p)

(d) line_data.extend(float(p.strip()))

(e) More than one of the other options is correct.

(2020s1 Q30) 29. What is the required code for ## line 2 ##?

(a) colsum = data[index][row]

(b) colsum = data[row][index]

(c) colsum += data[index][row]

(d) colsum += data[row][index]

(e) More than one of the other options is correct

(2020s1 Q31) 30. What is the required code for ## line 3 ##?

(a) column_sums.append(colsum)

(b) column_sums.extend(colsum)

(c) column_sums + colsum

(d) column_sums + [colsum]

(e) More than one of the other options is correct

(2020s2 Q15) 15. What will be printed out when the following code is run?

Python

```python
def g(w):
    w.append(f)
    return w
f=9
w=[60]
z = g(w)
print(z,w)
```

(a) [60, 9] [60, 9]

(b) [60, 9] [60]

(c) [60, 9] 9

(d) An error message will be printed out because f is not

passed to the function as an argument

(2020s2 Q16) 16. The following recursive function definition is used in this question and the next one.

Python

```python
def w(y) :
    if y == 1 :
        return y
    y -=1
    return w(y-1) - 1
```

What will be returned when w(4) is called?

(a) 0

(b) 1

(c) 5

(d) An error message indicating a RecursionError due to

maximum recursion depth being exceeded

(2020s2 Q17) 17. What will be returned when the function w(1) is called?

(a) 0

(b) 1

(c) -1

(d) An error message indicating a RecursionError due to

maximum recursion depth being exceeded

(2021s1 Q14) 14. What is output after calling the function f1?

Python

```python
def f1() -> None:
    v = 8
    x = f2(v)
    print(v)

def f2(x: int) -> int:
    v = 2
    return x // v  f1()
```

a) 8

b) 4

c) 2

d) 0

e) Error

(2021s1 Q15) 15. What is output after the following code is executed?

Python

```python
def f(x: list[int]) -> int:
    y = 0
    z = 0
    for i in x:
        y += i
        z += 1
    return y / z

a = [10, 20, 30, 40]
print(f(a))
```

a) 10.0

b) 25.0

c) 33.33333333336

d) 40.0

e) Error

(2021s1 Q16) 16. What is output after the following code is executed?

Python

```python
def f(x: list[int]) -> None:
    for i in range(len(x) // 2):
        y = x[i]
        x[i] = x[len(x) - i - 1]
        x[len(x) - i - 1] = y

a = [1, 2, 3, 4, 5]
f(a)
print(a)
```

a) [1, 2, 3, 4, 5]

b) [1, 4, 3, 2, 5]

c) [5, 2, 3, 4, 1]

d) [5, 4, 3, 2, 1]

e) Error

(2021s1 Q17) 17. Assuming that the parameter lst is a list of integer values, which of the following descriptions best describe the purpose of this function?

Python

```python
def f(lst: list[int]) -> tuple[int, int]:
    x = lst[0]
    y = lst[0]
    for i in lst:
        if x > i:
            x = i
        elif y < i:
            y = i
    return x, y
```

a) It returns the sum of the half of the list made up of the smallest numbers, and the sum of the half of the list made up of the largest numbers.

b) It raises an error because the type hint indicates it returns a tuple but the code returns two values.

c) It returns the smallest and largest values found in the list.

d) It returns how many even and odd integers were in the list.

(2021s1 Q20) 20. What is output after the following code is executed:

Python

```python
def f(x: int) -> None:
    if x <= 0:
        raise ValueError("value must be positive")
    while x > 0:
        print(x, end=',')
        x -= 1

try:
    f(-5)
except ValueError as e:
    print(str(e))
```

a) value must be positive

b) -5,-4,-3,-2,-1,0,

c) 5,4,3,2,1,

d) There is no output because the while loop is never entered in function f.

e) The while loop in function f is an infinite loop, so the output never stops.

(2021s1 Q21) 21. For the following function:

Python

```python
def r(x: int, y: int) -> int:
    if x == 0:
        return x * y
    return r(x - 1, y) + y
```

What will r(4, 2) return?

a) 10

b) 8

c) 4

d) 0

e) RecursionError: maximum recursion depth exceeded

The next two questions refer to the following function definition, which is missing two fragments of code. The function reads student assessment results for a course from a file. It then calculates the total mark achieved by each student in the course and saves this to another file. The following is an example of a data file (marks.csv).

41234567,10,9,14,18,42
40000000,5,5,7,8,12
41111111,8,6,12,14,21

The first value on each line of the file is a student number. All the following data items on the line are the marks the student achieved in each assessment in the course. These values may be integer or floating point and are separated by a comma. You may assume that the data in the input file is correctly formatted. The results are written to an output file where each line has a student number and total mark for the course.

The definition of the process function, with two missing code fragments, is given below.

Python

```python
def process(marks: str, results: str) -> None:
    with open(marks, 'r') as mark_data, \
        open(results, 'w') as result_data:
        for entry in mark_data:
            student = entry.split(',')
            ## Fragment 1: Initialise student's score ##
            ## Fragment 2: Calculate student's total score ##
            result_data.write(student[0] + ',' + str(student_score) + '\n')
```

The result of calling the completed function on the file described above, for example by:

Python

```python
process('marks.csv', 'results.csv')
```

would result in the following data being saved to results.csv.

41234567,93.0

40000000,37.0

41111111,61.0

When answering question 28, assume that the correct code has been implemented from the previous question.

(2021s1 Q27) 27. What code is required at ## Fragment 1: Initialise student's score ##?

a) student_score = float(student[0])

b) student_score = student[0]

c) student_score = 1

d) student_score = 0

e) None of the code fragments would implement the function correctly.

(2021s1 Q28) 28. What code is required at ## Fragment 2: Calculate student's total score ##?

a)

Plain Text

```
for i in range(1, len(student)):
    student_score += float(student[i])
```

b)

Plain Text

```
for i in range(1, len(student)):
    student_score += student[i]
```

c)

Plain Text

```
for score in student:
    student_score += float(score)
```

d)

Plain Text

```
for score in student:
    student_score += score
```

e) None of the code fragments would implement the function correctly.

递归函数

~~(2015s1 Q37) 319. Below is a recursive definition of a (non-empty) linked list class. A linked list consists of a head (a value) and a tail (a linked list).~~

Python

```python
class LinkedList:
    def __init__(self, head, tail):
        self._head = head
        self._tail = tail

    def head(self):
        return self._head

    def tail(self):
        return self._tail

    def isLast(self):
        return self._tail == None

    def values(self):
        result, scan = [], self
        while not scan.isLast():
            result.append(scan.head())
            scan = scan.tail()
        result.append(scan.head())
        return result
```

~~Below is an incomplete recursive definition of concat for concatenating two linked lists to produce a linked list. As an example of its use consider the following involving the linked lists x and y.~~

Python

```python
>>> x.values()
[1, 2, 3, 4]
>>> y.values()
[5, 6, 7, 8]
>>> z = concat(x, y)
>>> z.values()
[1, 2, 3, 4, 5, 6, 7, 8]
```

~~What expression needs to replace #### in order to complete the following recursive definition of concat?~~

Python

```python
def concat(xs, ys):
    if xs.isLast():
        return LinkedList(xs.head(), ys)
    else:
        return ####
```

(a) LinkedList(ys.head(), concat(ys.tail(), xs))

(b) LinkedList(ys.tail(), concat(xs.head(), ys))

(c) LinkedList(xs.head(), concat(xs.tail(), ys))

(d) LinkedList(xs.tail(), concat(xs.head(), ys))

(e) None of the above

(2016s1 Q39) 320. This question relates to the incomplete recursive function definition below that calculates the prime factors of an integer in non-decreasing order. The following gives examples of calling the function.

>>> prime_factors(12)

[2, 2, 3]

>>> prime_factors(17)

[17]

>>> prime_factors(25)

[5, 5]

>>> prime_factors(15)

[3, 5]

What expression needs to replace #### in order to complete the following recursive definition for the following prime_factors function.

Python

```python
def prime_factors(n):
"""Return the prime factors of n in non-decreasing order
prime_factors(int) -> list(int)
Precondition: n > 1
"""
    for i in range(2, n):
        if n % i == 0:
            ####
    return [n]
```

(a) return prime_factors(n//i) + [i]

(b) return [i] + prime_factors(n//i)

(c) return [i].extend(prime_factors(n//i))

(d) return prime_factors(n//i).append(i)

(e) More than one of the above is correct.

(2017s1 Q20) 321. For the following function:

Python

```python
def rec(x):
    if x==1:
        return x
    else:
        return rec(x-1)*x
```

What will rec(4) return?

a) 0

b) 4

c) 8

d) 24

(2019s1 Q23) 328. For the following function:

Python

```python
def r(x) :
    if x == 0 :
        return x
    else :
        return r(x-1) + x
```

What will r(5) return?

a) 0

b) 10

c) 15

d) 21

e) Error

(2017s1 Q21) 322. The following is a recursive function to calculate the product of a list of numbers. Example usage:

Python

```python

product([]) = 0
product([4, 2]) = 8
product([3, 2, 4]) = 18
product([2, 3, 4, 5, 6]) = 720

# 4 * 2
# 3 * 2 * 4
# 2 * 3 * 4 * 5 * 6
```

Python

```python
def product(nums) :
    total = 0
    if len(nums) == 0  :
        return 0
    elif len(nums) == 1:
        return nums[0]
    return ## TODO: what goes here
```

Which line of code will correctly complete the function above?

a) (product(nums[:len(nums) // 2]) * product(nums[len(nums) // 2:]))

b) product(nums[1:]) * product(nums[:-1])

c) (product(nums[1:len(nums) / 2]) * product(nums[len(nums) / 2:-1]))

d) (product(nums[1:len(nums)]) * product(nums[len(nums):-1]))

(2016s2 Q38) 323. What expression needs to replace #### in order to complete the following recursive definition for converting a list of binary bits into a positive integer.

Python

```python
def binary2int(digits):
        """ Return the integer represented by the binary digits.
        Example: binary2int([1,1,0,1]) = 13
        binary2int(list(int)) => int
        """
        if digits == []:
             return 0
        else:
             return ####
```

(a) digits[0] + 2*binary2int(digits[1:])

(b) digits[0] + 2*binary2int(digits[:-1])

(c) digits[-1] + 2*binary2int(digits[1:])

(d) digits[-1] + 2*binary2int(digits[:-1])

(e) None of the above

(2016s2 Q39) 324.This question relates to the incomplete recursive function definition below that provides indexing into a nested list. The following gives examples of calling the function.

Python

```python
>>> nested = [[[1, 2], 3], 7, [4, [5, 6]], [8, 9, 10]]
>>> recursiveIndex(nested, [])
[[[1, 2], 3], 7, [4, [5, 6]], [8, 9, 10]]
>>> recursiveIndex(nested, [2,1,0])
5
```

The first example above shows what happens when the second argument (the indexing list) is empty. The second example indexes the 0’ th element of the 1’ th element of the 2’ th element of nested.

What expression needs to replace #### in order to complete the following recursive definition for indexing a nested list

Python

```python
def recursiveIndex(nested, indexes):
        """Return the element of the required sublist of the nested list
        (nested) at the position specified by indexes
        Precondition: indexes specifies a "valid" element of the nested list """

        if indexes == []:
            return nested
        else:
            return ####
```

(a) recursiveIndex(nested[indexes[0]], indexes[:-1])

(b) recursiveIndex(nested[indexes[0]], indexes[1:])

(c) recursiveIndex(nested[indexes[-1]], indexes[:-1])

(d) recursiveIndex(nested[indexes[-1]], indexes[1:])

(e) None of the above

(2017s2 Q39) 325. This question relates to the incomplete recursive function definition below that provides indexing into a nested list. The following gives examples of calling the function.

Python

```python
>>> nested = [[[3, 6], 3], 11, [4, [3, 6]], [12, 2, 10]]
>>> recursive_index(nested, [])
[[[3, 6], 3], 11, [4, [3, 6]], [12, 2, 10]]
>>> recursive_index(nested, [2,1,0])
3

```

The first example above shows what happens when the second argument (the indexing list) is empty. The second example indexes the 0’ th element of the 1’ th element of the 2’ th element of nested.

What expression needs to replace #### in order to complete the following recursive definition for indexing a nested list

Python

```python
def recursiveIndex(nested, indexes):

      """Return the element of the required sublist of the nested list
      (nested) at the position specified by indexes
      Precondition: indexes specifies a "valid" element of the nested list """

      if indexes == []:
            return nested
      else:
            return ####
```

(a) recursive_index(nested[indexes[0]], indexes[:-1])

(b) recursive_index(nested[indexes[0]], indexes[1:])

(c) recursive_index(nested[indexes[-1]], indexes[:-1])

(d) recursive_index(nested[indexes[-1]], indexes[1:])

(e) None of the above

(2019s2 Q25-26)

326-327. The following recursive function definition is used in the next two questions.

Python

```python
def fn1(x):
    if len(x) == [0]:
        return x
    return fn1(x[3:] + x[0])
```

(2019s2 Q25) 326. What will the function call fn1([2, 4, 1, 1, 5]) return?

a) [5, 2, 1, 4, 1]

b) [2,5]

c) [1]

d) RecursionError will be raised due to maximum recursion

depth being exceeded.

(2019s2 Q26) 327. What will the function call fn1([4, 1, 3, 2, 6]) return?

a) [7, 4, 1, 3, 2]

b) [7, 1, 2]

c) [3, 7]

d) RecursionError will be raised due to maximum recursion

depth being exceeded.

(2019s1 Q24) 329. The following is a recursive function to check to see if an item is in a list of numbers. It assumes that the values in alist are stored in ascending order.

Python

```python
def in_list(alist, item) :
    if len(alist) == 0 :
        return False
    else :
        midpoint = len(alist) // 2
        if alist[midpoint] == item :
            return ## Fragment 1
        else :
            if item < alist[midpoint] :
                return ## Fragment 2
            else :
                return ## Fragment 3

```

Example usage:

Python

```python

in_list([1, 4, 9, 13, 25], 13) == True
in_list([1, 4, 9, 13, 25], 17) == False
```

Which code fragments will correctly complete the function above?

a) Fragment 1 is: True

Fragment 2 is: in_list(alist[:midpoint], item)

Fragment 3 is: in_list(alist[midpoint+1:], item)

b) Fragment 1 is: True

Fragment 2 is: in_list(alist[midpoint+1:], item)

Fragment 3 is: in_list(alist[:midpoint], item)

c) Fragment 1 is: False

Fragment 2 is: in_list(alist[:midpoint], item)

Fragment 3 is: in_list(alist[midpoint+1:], item)

d) Fragment 1 is: False

Fragment 2 is: in_list(alist[midpoint+1:], item)

Fragment 3 is: in_list(alist[:midpoint], item)

e) None of the code fragments would implement the function correctly.

(2018s2 Q20-21)

330-331. The following recursive function definition is used in the next two questions.

Python

```python
def rec(x) :
    if len(x) == x[0] :
        return x
    return rec(x[2:] + [x[0]])
```

(2018s2 Q20) 330. What will the function call rec([1, 2, 2, 1, 4]) return?

a) [5, 3, 3, 2, 1]

b) [5, 3, 1]

c) [2, 4]

d) RecursionError will be raised due to maximum recursion

depth being exceeded.

e) None of the above

(2018s2 Q21) 331. What will the function call rec([4, 2, 3, 8, 6]) return?

a) [7, 4, 1, 3, 2]

b) [7, 1, 2]

c) [3, 7]

d) RecursionError will be raised due to maximum recursion

depth being exceeded.

(2018s2 Q39) 332. This question relates to the incomplete recursive function definition below that provides indexing into a nested list. The following gives examples of calling the function.

Python

```python
>>> nested = [[[1, 2], 3], 7, [4, [5, 6]], [8, 9, 10]]
>>> recursiveIndex(nested, [])
[[[1, 2], 3], 7, [4, [5, 6]], [8, 9, 10]]
>>> recursiveIndex(nested, [2,1,0])
5
```

The first example above shows what happens when the second argument (the indexing list) is empty. The second example indexes the 0’ th element of the 1’ th element of the 2’ th element of nested.

What expression needs to replace #### in order to complete the following recursive definition for indexing a nested list

```python
def recursiveIndex(nested, indexes):
    """Return the element of the required sublist of the
nested list
    (nested) at the position specified by indexes
    Precondition: indexes specifies a "valid" element of the
nested list """
    if indexes == []:
        return nested
    else:
        return ####
```

a) recursiveIndex(nested[indexes[0]], indexes[:-1])

b) recursiveIndex(nested[indexes[0]], indexes[1:])

c) recursiveIndex(nested[indexes[-1]], indexes[:-1])

d) recursiveIndex(nested[indexes[-1]], indexes[1:])

e) None of the above

(2018s1 Q23-24)

333-334. The following recursive function definition is used in the next two questions.

```python
def rec(x) :
    if len(x) == x[0] :
        return x
    return rec(x[2:] + [x[0]])
```

(2018s1 Q23) 333. What will the function call rec([3, 3, 2, 1, 5]) return?

a) [5, 3, 3, 2, 1]

b) [5, 3, 1]

c) [2, 5]

d) RecursionError will be raised due to maximum recursion

depth being exceeded.

(2018s1 Q24) 334. What will the function call rec([4, 1, 3, 2, 7]) return?

a) [7, 4, 1, 3, 2]

b) [7, 1, 2]

c) [3, 7]

d) RecursionError will be raised due to maximum recursion

depth being exceeded.

(2018s1 Q25) 335. The following is a recursive function to calculate the sum of a list of numbers. Example usage:

Python

```python
sum([]) # 0
sum([1]) # 1
sum([1, 2]) # 3
sum([1, 2, 3]) # 6

def sum(nums) :
    total = 0
    if len(nums) == 0  :
        return 0
    elif len(nums) == 1:
        return nums[0]
    return ## TODO: what goes here

# 1 + 2
# 1 + 2 + 3
```

Which code fragment will correctly complete the function above?

a) (sum(nums[:len(nums) // 2]) + sum(nums[len(nums) // 2:]))

b) (sum(nums[1:len(nums) / 2]) + sum(nums[len(nums) / 2:-1]))

c) sum(nums[1:len(nums)]) + sum(nums[len(nums):-1])

d) sum(nums[1:]) + sum(nums[:-1])

The next two questions refer to the following function definition, which is missing two fragments of code. It is a recursive function to find all the positive whole number divisors of a number between the parameters i and number. The list of divisors will be returned via the parameter result.

Python

```python
def positive_divisors(number: int, i: int, result: list[int]) -> None:
    """
    Precondition: number > 0 and i > 0
    """
    if number % i == 0:
        ## Fragment 1 ##
    if number > i:
        ## Fragment 2 ##
# Example usage:
r = []
positive_divisors(2, 1, r)
r == [1, 2]
r = []
positive_divisors(9, 1, r)
r == [1, 3, 9]
```

When answering question 26, assume that the correct code has been implemented from the previous question.

(2021s1 Q25) 25. What code is required at ## Fragment 1 ##?

a) return 0

b) return i

c) result += i

d) result.append(i)

e) None of the code fragments would implement the function correctly.

(2021s1 Q26) 26. What code is required at ## Fragment 2 ##?

a) positive_divisors(number, i-1, result)

b) positive_divisors(number, i+1, result)

c) positive_divisors(number, i, result)

d) positive_divisors(number, 1, result)

e) None of the code fragments would implement the function correctly.

高级特性

(2015s1 Q40) 336. What is the value of y after the following has been evaluated?

Python

```python
def t(xs):
    return [[xs[i][j] for i in range(len(xs))] for j in range(len(xs[0]))]
y = t([[1,2,3],[4,5,6]])
```

(a) [1,2,3,4,5,6]

(b) [[1,2,3], [4,5,6]]

(c) [[1,4],[2,5], [3, 6]]

(d) [[1], [2], [3], [4], [5], [6]]

(e) Error

(2015s2 Q40) 337. What is the value of y after the following has been evaluated?

Python

```python
g = lambda x,y: (x-y)
f = lambda x,y: x > y
xs = [1,2,3,4]
y = [g(x,y) for x in xs for y in xs if f(x,y)]
```

(a) [1, 1, 1, 2, 2, 3]

(b) [1, 2, 1, 1, 2, 3]

(c) [1, 2, 1, 3, 2, 1]

(d) [1, 2, 3, 1, 2, 1]

(e) Error

(2016s1 Q40) 338. What is the value of y after the following has been evaluated?

Python

```python
def s(xs):
    return [’’.join([xs[i][j] for i in range(len(xs))]) for j in range(len(xs[0]))]
y = s(["Hi", "There"])
```

(a) [’ Hi’ ,’ Th’]

(b) [’ HiTh’]

(c) [’ HT’ ,’ ih’]

(d) [’ TH’ ,’ hi’]

(e) Error

(2016s2 Q40) 339. What is the value of y after the following has been evaluated?

Python

```python
g = lambda x,y: (x-y)
f = lambda x,y: y > x
xs = [0, 2, 4, 6]
y = [g(x,y) for x in xs for y in xs if f(x,y)]
```

(a) [2, 4, 2, 6, 4, 2]

(b) [-2, -4, -6, -2, -4, -2]

(c) [-2, 2, -4, 4, -6, 6]

(d) [2, 2, -4, 4, -6, 6]

(e) Error

(2017s2 Q40) 340. What is the value of y after the following has been evaluated?

Python

```
x = lambda u,v: (u*v)
y = lambda u,v: u-v
ug = [0, 1, 2]
z = [x(u,v) for u in ug for v in ug if y(u,v)]
```

(a) [0, 0, 2, 2]

(b) [0, 0, 2, 4]

(c) [0, 0, 0, 2, 0, 2]

(d) [0, 0, 0, 2, 4, 6]

(e) Error

(2018s2 Q40) 341. What is the value of y after the following has been evaluated?

Python

```python
g = lambda x,y: (x+y)
f = lambda x,y: x > y
xs = [0,1,2,3]
y = [g(x,y) for x in xs for y in xs if f(x,y)]
```

a) [1, 1, 2, 2, 3, 3]

b) [1, 2, 4, 5, 3, 1]

c) [1, 2, 3, 3, 2, 1]

d) [1, 2, 3, 3, 4, 5]

e) Error

(2019s2 Q39) 342. What is the value of z after the following has been evaluated?

Python

```python
g = lambda x,y: (x+y)
xs = 'lots'
z = [g(x,y) for x in 'maze' for y in xs if y > 't']
```

a) []

b) ['mt', 'at', 'zt', 'et']

c) ['m', 'ml', 'mo', 'mt', 'ms']

d) ['ml', 'ao', 'zt', 'es']

e) None of the above

(2019s2 Q40) 343. After running the following code:

Python

```python
import random
xs=[1,2,3,4]
new_list=[(x,random.random()) for x in xs]
new_list.sort()
z=[(x,y) for y,x in new_list]
```

Which of the following represents the most plausible contents of z?

a) Error

b) [(1, 0.3656826997131658), (2, 0.4789711218283632),

(3, 0.20367358828920812), (4, 0.4651024789182844)]

c) [(0.23845323656036166, 2), (0.5411763744080424, 4),

(0.7368067435015173, 3), (0.9585633916983842, 1)]

d) [(0.7070150251404196, 1), (0.9635956493452444, 2),

(0.5960013756836279, 3), (0.9623962721301965, 4)]

e) None

(2020s1 Q36) 35. What will be returned after the following commands are entered? import operator

Python

```python
import operator
print(sum(list(map(operator.mul, [1,2,3,4],[5,6,7,8]))))
```

(a) 70

(b) [5, 12, 21, 32]

(c) 260

(d) [50, , 60, 70, 80]

(e) None of the other options are correct

(2020s2 Q36) 36. What will be returned after the following commands are entered?

Python

```python
import operator
print(sum(tuple(map(operator.add, [3,4,5,6],[4,5,6,7]))))
```

(a) 40

(b) (18, 22)

(c) (7, 9, 11, 13)

(d) <map object at 0x0370C3D0>

(e) Error

概念题

(2017s2 Q27) 356. Which of the following statements about dictionaries is true?

(a) Dictionary keys can be any type.

(b) Only numbers or strings can be dictionary keys.

(c) Dictionary keys must be immutable types.

(d) Both dictionary keys and values must be immutable types.

(e) If the dictionary keys are mutable then the corresponding values must be immutable.

(2017s1 Q35) 357. What is the advantage of using inheritance and polymorphism in designing a class hierarchy?

a) They provide a mechanism to extend a program by adding new functionality by inheriting from a class and overriding one or more of the methods defined in the super class.
b) They provide a mechanism to reuse code written in a super class, reducing the amount of code and testing that needs to be done for an application.
c) They provide a mechanism to extend standard libraries so that programmers working on other projects can take advantage of the new features added to the libraries.
d) They provide a mechanism to simplify class design by enabling the code to be split into multiple files.
e) None of the answers above are valid descriptions of an advantage of using inheritance and polymorphism.

(2017s1 Q15) 358. In general, why are docstrings necessary when developing good quality code?

a) The person who reads the code may not be familiar with the programming language so will need extra guidance to help them understand what it

does.
b) To inform the users of a class, method or function about what it does, how to use it, and what its input and output types are.
c) The docstring provides a description of the algorithm implemented by the class, method or function code.
d) Python uses the docstring to check that parameters passed to a function or method are of the correct type.

(2017s1 Q16) 359. Why should inline comments be used?

a) The person who reads the code may not know how to program so the comments are necessary to describe in detail what the code does.
b) To allow the programmer to add their own personal style to the structure of the code.
c) They should not be used as the code should be self-explanatory.
d) To explain complex or tricky parts of the code.

(2017s1 Q17) 360. Why is the use of global variables considered to be bad practice?

a) Global variables use up more memory than local variables.
b) Accessing global variables is inefficient and slower than accessing local variables.
c) Global variables can be modified by any part of the program, making it difficult to trace errors.
d) They are not bad practice as they are a useful way to share data between different parts of a program.

(2019s2 Q15) 361. Select the correct statement from the following:

a) Strings, tuples, and dictionaries are immutable

b) Lists and integers are mutable

c) Booleans are mutable

d) None of the above are true

(2018s1 Q13) 362. Consider the following two lines of code.

```
d = {1:'a', 2:'b', 3:'c'}
d[['d']] = 4
```

Which of the following statements best explain why this code **raises an error** when executed?

a) Dictionary keys must be immutable types.

b) There is no value mapped to the key ['d'].

c) There is a syntax error in the second statement.

d) All keys in a dictionary must be of the same type.

e) All values in a dictionary must be of the same type.

(2018s1 Q16) 363. The syntax of the for statement is:

```
for <item> in <items> :
```

Which of the following is true about <items>?

a) It can only be a list.

b) It cannot be a tuple.

c) It must be sorted in ascending order.

d) It can be any sequence, like a string or list.

(2018s1 Q18) 364. Why is it good practice to use constants in your code?

a) They make it easier to modify the code when values change .

b) They allow the same value to be used multiple times without being redeclared as a literal value.

c) They improve the readability of the code by providing a descriptive name for a value rather than just the value.

d) All of the above.

e) None of the above.

(2018s1 Q20) 365. For the following block of code:

Python

```python
student_numbers = ["s0123456", "s1234567",
                   "s2345678", "s3456789"]
assessment_marks = [[10, 19, 18, 10, 38]
                    [8, 17, 15, 9, 35]
                    [5, 20, 8, 7, 7, 33]
                    [4, 18, 7, 6, 6, 29]]
grades = [7, 6, 6, 5]
course = [CSSE1001, CSSE1001, INFS1200, INFS1200]
```

Which of the following programming constructs would be best suited to making the above code **more structured and maintainable**?

a) a dictionary

b) a function

c) a class

d) a tuple

(2018s1 Q21) 366. What is the purpose of raising an exception in your code?

a) To indicate that the code has encountered an error it cannot handle locally.

b) To indicate that this block of code will resolve an error encountered in a previous function call.

c) To indicate that this block of code will attempt to execute some statements that may cause an error.

d) To prevent the Python interpreter from halting execution of a program when an error is encountered.

(2019s1 Q10) 367. Why can a list not be used as a key for a value in a dictionary? i.e. The following code will raise an error:

```
d = {[1,2]:'a', [4,5]:'b'}
```

a) The Python interpreter cannot determine which list value to use as the key.

b) A list may be empty, so its contents cannot be hashed to generate an index.

c) Dictionary keys must be immutable types, so that the key’ s index does not change.

d) Lists may contain elements of different types and all keys in a dictionary must be of the same type.

(2018s1 Q19) 368. Which of the following statements best describes the relationship between a class and an object?

a) A class is a programming construct used to describe one or more objects.

b) An object is a variable defined in side of a class.

c) A class is an instance of an object.

d) They are the same thing.

(2019s1 Q18) 369. Why are global constants considered to be good programming style, while global variables are bad programming style?

a) Global constants are still global values and are bad programming style and
should be avoided.

b) In the Python interpreter, as global constants do not change value, they
can be cached in high speed memory to provide faster lookup times for
their values.

c) Constants do not change value, so they allow meaningful names to be
given to commonly used values that can be referenced anywhere in a
program.

d) Both (b) and (c).

(2019s1 Q19) 370. What is the purpose of the try statement in Python?

a) To indicate that the code has encountered an error it cannot handle locally.

b) To provide an error handling function that will be called if any error occurs
in a block of code.

c) To guarantee that any errors raised by a block of code will be handled, so

that the program will not crash.
d) To attempt to execute a block of code and handle at least some of the errors that may be raised by the statements in the block of code.

(2019s1 Q31) 371. What is an advantage of using classes to structure your program over just using functions?

a) Classes provide a mechanism to encapsulate data and behaviour together. This means that only the methods defined in the class will manipulate an object’ s data. Consequently, there is less chance of unknown parts of a program using an object’ s data and breaking the program’ s logic.

b) Classes are a mechanism to group related functions together that reduces the amount of code that needs to be written in each function. This mechanism inherently reduces duplication between similar functions. Consequently, using classes improves your code readability.

c) Classes provide a mechanism to group related functions into a single file. This simplifies maintenance of the code, as all similar functionality is stored in a single file. Consequently, it is faster to search for the implementation of functionality across files in the file system.

d) Classes make it easier to reuse code. Whenever a programmer wants to reuse a method, they can inherit from the class that defines the method and then call that method in their code. Consequently, it simplifies access to existing methods.

e) None of the answers above are valid descriptions of an advantage of using classes to structure your program over just using functions.

(2020s1 Q35) 34. Which of the following is true?

(a) Lists are mutable but dictionaries are immutable

(b) User defined classes are by default immutable

(c) Values and keys in dictionaries must both be immutable

(d) Strings, integers, floats, booleans and image objects are all immutable

(e) None of the other options are true

(2020s2 Q35) 35. Which of the following is true?

(a) Strings, integers, floats, booleans and tuples are all immutable

(b) Objects from user defined classes are by default immutable

(c) Dictionaries are immutable

(d) More than one of the above options is true

(e) None of the other options are true

(2021s1 Q18) 18. Which of the following statements is correct regarding global variables?

a) Global variables save memory, as they are stored once for the entire program, and should be used in good software design.

b) Global variables are shared across the entire program, meaning it is more difficult to determine when their value has changed.

c) Global variables are inefficient because every function call has to create a copy of the variables in case they are used in the function.

d) Global variables provide a way of describing all important variables in a program in a single location, so assist with writing good documentation.

e) Both (b) and (c).

(2021s1 Q22) 22. For the following block of code:

Python

```python
TITLE = 0
RELEASE_YEAR = 1
NOMINATIONS = 2
AWARDS = 3
movies = [("Parasite", 2019, 6, 4),
          ("Little Women", 2019, 6, 1),
          ("1917", 2019, 10, 3),
          ("Bohemian Rhapsody", 2018, 5, 3),
          ("Black Panther", 2018, 7, 3)]


def num_awards(movie: tuple[str, int, int, int]) -> int:
    return movie[AWARDS]


def num_nominations(movie: tuple[str, int, int, int]) -> int:
    return movie[NOMINATIONS]


def add_award(movie: tuple[str, int, int, int], new_awards: int) \
        -> tuple[str, int, int, int]:
    return (movie[TITLE], movie[RELEASE_YEAR],
            movie[NOMINATIONS], movie[AWARDS] + new_awards)


movies[2] = add_award(movies[2], 2)
```

Which of the following programming constructs would most significantly simplify the above code?

a) dictionary

b) while loop

c) if statement

d) function

e) class

(2021s1 Q32) 32. When designing classes, what does "respecting the abstraction barrier" mean?

a) It means that if the implementation of a class’ data structure or methods changes, but the interface to the methods does not change, other code can continue to use objects of the class without any changes.

b) It means that a subclass can use the attributes of its superclass without worrying about changes in the design of the superclass.

c) It means that methods should only directly access the private attributes of the class and not call other methods of the class. This avoids passing unnecessary parameters to methods.

d) It means that the class is designed so that most methods make use of most attributes of the class. This indicates that the class is a well-designed simple concept.

e) None of the answers above are valid descriptions of “respecting the abstraction barrier”.

Coding 代码大题

归档

题型十一：GUI图形用户界面

(2016s1 Q37-38)

303-304. The following 2 questions refer to the following definition that is missing an argument and a line of code. A GUI application uses the following class that inherits from the Canvas class. When the left mouse buttonis pressed the x, y coordinates of where the mouse was clicked is printed. So, for example, when the mouse is clicked at the point (10, 20) the output: (10, 20), will appear in the interpreter window.

Python

```python
class ClickCanvas(tk.Canvas):
    def __init__(self, master):
        super().__init__(master)
        self.bind("<Button-1>", ## arg ##)

    def showXY(self, e):
        ## line ##

```

(2016s1 Q37) 303. What is the required expression for ## arg ##

(a) showXY(self)

(b) showXY(self, e)

(c) self.showXY

(d) self.showXY()

(e) self.showXY(e)

(2016s1 Q38) 304. What is the required code for ## line ## so that the method behaves as required.

(a) print(e.x, e.y)

(b) print((e.x, e.y))

(c) print(e)

(d) print((e))

(e) More than one of the above is correct.

(2017s2 Q36) 305. How do you create a root window?

(a) root = tk.rootWindow()

(b) root=tk.Window()

(c) root=tk.Frame()

(d) root=tk.Tk()

(2017s2 Q37) 306. To create a menu in a window, use __________

(a) menubar = tk.Menu(master)

(b) menubar = tk.MenuBar(master)

(c) menubar = tk.Menu()

(d) menubar = tk.MenuBar()

(2017s2 Q38) 307. How do you create an event loop?

(a) root.event()

(b) root.main()

(c) root.mainloop()

(d) root.eventloop()

(2015s2 Q36-37)

308-309. The next two questions relate to the following partial definitions. In our GUI application we decide we need a widget that contains two buttons and that this widget is to appear within the main window of the application to the right of the label as shown in the diagram below. (Recall that a ; can be used to put two program statements on the one line.)

Python

```python
class ButtonsFrame(tk.Frame):
    def __init__(self,parent):
        tk.Frame.__init__(self, parent.root):
        b1 = tk.Button(self, text= "A")
        b2 = tk.Button(self, text = "B")
        ## line 1 ##

class MainWindow(object):
    def __init__(self, root):
        self._root = root
        label = tk.Label(root, text="Buttons")
        label.pack(side=tk.LEFT)
        bf = ButtonsFrame(self)
        ## line 2 ##

```

(2015s2 Q36) 308. What is the required code for ## line 1 ##?

(a) b1.pack(side=tk.LEFT); b2.pack(side=tk.LEFT)

(b) b1.pack(expand=1); b2.pack(expand=1)

(c) b1.pack(fill=tk.BOTH); b2.pack(fill=tk.BOTH)

(d) b1.pack(); b2.pack()

(e) More than one of the above is correct.

(2015s2 Q37) 309. What is the required code for ## line 2 ##?

(a) bf.pack(side=tk.LEFT, expand=1)

(b) bf.pack(side=tk.LEFT, fill=tk.BOTH, expand=1)

(c) bf.pack(side=tk.LEFT)

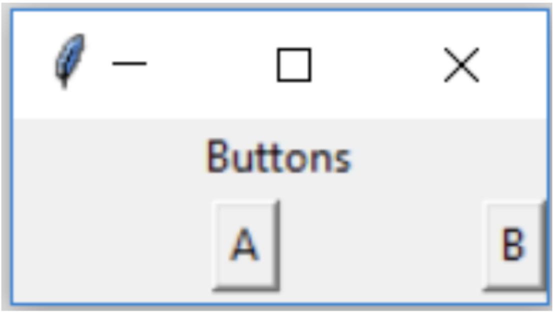
(d) bf.pack(side=tk.LEFT, fill=tk.BOTH)

(e) More than one of the above is correct.

(2017s1 Q36-37)

310-311.The next two question relate to the following partial definitions. In a GUI application we decide we need a widget that contains two buttons and that this widget is to appear within the main window of the application below the label as

shown in the image below.



Python

```python
class ButtonsFrame(Frame) :
    def __init__(self, parent) :
        Frame.__init__(self, parent.root)
        b1 = Button(self, text= "A")
        b2 = Button(self, text = "B")
        ## lines 1 and 2 ##

class MainWindow(object) :
    def __init__(self, root) :
        self.root = root
        Label(root, text="Buttons").pack()
        bf = ButtonsFrame(self)
        ## line 3 ##
```

(2017s1 Q36) 310. What is the required code for ## lines 1 and 2 ##?

a) b1.pack(side=LEFT, expand=1)

b2.pack(side=LEFT)

b) b1.pack(side=LEFT, expand=1)

b2.pack(side=LEFT, expand=1)

c) b1.pack(side=LEFT, fill=BOTH)

b2.pack(side=LEFT, fill=BOTH)

d) b1.pack(side=LEFT, fill=BOTH)

b2.pack(side=LEFT, fill=X)

e) More than one of the above is correct.

(2017s1 Q37) 311. What is the required code for ## line 3 ##?

a) bf.pack(expand=1)

b) bf.pack(fill=BOTH, expand=1)

c) bf.pack()

d) bf.pack(fill=BOTH)

e) More than one of the above is correct.

(2018s2 Q37-38)

312-313. The next two questions relate to the following partial implementation of a GUI. The application has two buttons in a frame and custom canvas on which the circle can be moved left or right by clicking on the buttons. The completed GUI is shown in the image below.

Python

```python
import tkinter as tk
class Screen(tk.Canvas):
    def __init__(self, parent):
        super().__init__(parent, bg="light blue",
                         width=150, height=150)
        self._x, self._y = (width / 2, height / 2)
        self._redraw()
    def _redraw(self):
        """Redraw the screen after a move."""
        self.delete(tk.ALL)

        ## code block 1 ##

    def _move(self, dx, dy):
        """Move the circle by a given amount."""
        self._x += dx
        self._y += dy
        self._redraw()
    def move_left(self):
        self._move(-5, 0)
    def move_right(self):
        self._move(5, 0)

class Controls(tk.Frame):
    BUTTON_WIDTH = 10
    def __init__(self, parent, left, right):
        """Parameters:
            parent (Tk): Window for widget.
            left (method): Callback for "left button".
            right (method): Callback for "right button".
        """
        super().__init__(parent)
        ## code block 2 ##

class GameApp(object):
    def __init__(self, master):
        master.title("Game")
        screen = Screen(master)
        controls = Controls(master, screen.move_left,
                            screen.move_right)
        controls.pack(side=tk.LEFT)
        screen.pack(side=tk.LEFT, expand=True,
                    fill=tk.BOTH)
```

(2018s2 Q37) 312. What is the required code for ## code block 1 ##?

a) coords = (self._x - 5, self._y - 5, self._x + 5, self._y + 5)

create_oval(coords, fill="black", width=0)

b) coords = (self._x - 5, self._y - 5, self._x + 5, self._y + 5)

self.create_oval(coords, fill="black", width=0)

c) coords = (self._x - 5, self._y - 5, self._x + 5, self._y + 5)

Canvas.create_oval(coords, fill="black", width=0)

d) coords = (self._x - 5, self._y - 5, self._x + 5, self._y + 5)

super().create_oval(coords, fill="black", width=0)

e) More than one of the above is correct.

(2018s2 Q38) 313. What is the required code for ## code block 2 ##?

a) left_btn = tk.Button(self, text="LEFT", width=10, command=left())

left_btn.pack(side=tk.LEFT)

right_btn = tk.Button(self, text="RIGHT", width=10, command=right())

right_btn.pack(side=tk.LEFT)

b) left_btn = tk.Button(self, text="LEFT", width=10, command=Screen.left())

left_btn.pack(side=tk.LEFT)

right_btn = tk.Button(self, text="RIGHT", width=10, command=Screen.right())

right_btn.pack(side=tk.LEFT)

c) left_btn = tk.Button(self, text="LEFT", width=10, command=self.left())

left_btn.pack(side=tk.LEFT)

right_btn = tk.Button(self, text="RIGHT", width=10, command=self.right())

right_btn.pack(side=tk.LEFT)

d) left_btn = tk.Button(self, text="LEFT", width=10, command=left)

left_btn.pack(side=tk.LEFT)

right_btn = tk.Button(self, text="RIGHT", width=10, command=right)

right_btn.pack(side=tk.LEFT)

e) More than one of the above is correct.

(2018s1 Q37-38)

314-315. The next two questions relate to the following partial implementation of a GUI. The application has two buttons in a frame and custom canvas on which the circle can be moved left or right by clicking on the buttons. The completed GUI is shown in the image below.

Python

```python
import tkinter as tk

class Screen(tk.Canvas):
    def __init__(self, parent):
        super().__init__(parent, bg="light blue",
                         width=150, height=150)
        self._x, self._y = (150 / 2, 150 / 2)
        self._redraw()

    def _redraw(self):
        """Redraw the screen after a move."""
        self.delete(tk.ALL)
        ## code block 1 ##

    def _move(self, dx, dy):
        """Move the circle by a given amount."""
        self._x += dx
        self._y += dy
        self._redraw()

    def move_left(self):
        self._move(-5, 0)

    def move_right(self):
        self._move(5, 0)
        self._move(5, 0)




class Controls(tk.Frame):
    BUTTON_WIDTH = 10

    def __init__(self, parent, left, right):
        """Parameters:
            parent (Tk): Window for widget.
            left (method): Callback for "left button".
            right (method): Callback for "right button".
        """
        super().__init__(parent)
        ## code block 2 ##

class GameApp(object):
    def __init__(self, master):
        master.title("Game")
        screen = Screen(master)
        controls = Controls(master, screen.move_left,
                            screen.move_right)
        controls.pack(side=tk.LEFT)
        screen.pack(side=tk.LEFT, expand=True,
                    fill=tk.BOTH)
```

(2018s1 Q37) 314. What is the required code for ## code block 1 ##?

a) coords = (self._x - 5, self._y - 5, self._x + 5, self._y + 5)

create_oval(coords, fill="black", width=0)

b) coords = (self._x - 5, self._y - 5, self._x + 5, self._y + 5)

self.create_oval(coords, fill="black", width=0)

c) coords = (self._x - 5, self._y - 5, self._x + 5, self._y + 5)

Canvas.create_oval(coords, fill="black", width=0)

d) coords = (self._x - 5, self._y - 5, self._x + 5, self._y + 5)

super().create_oval(coords, fill="black", width=0)

e) More than one of the above is correct.

(2018s1 Q38) 315. What is the required code for ## code block 2 ##?

```
a) leftBtn = tk.Button(self, text="LEFT",
                width=10, command=left())
leftBtn.pack(side=tk.LEFT)
rightBtn = tk.Button(self, text="RIGHT",
                 width=10, command=right())
rightBtn.pack(side=tk.LEFT)
```

```
b) leftBtn = tk.Button(self, text="LEFT",
                width=10, command=Screen.left())
leftBtn.pack(side=tk.LEFT)
rightBtn = tk.Button(self, text="RIGHT",
                 width=10, command=Screen.right())
rightBtn.pack(side=tk.LEFT)
```

```
c) leftBtn = tk.Button(self, text="LEFT",
                width=10, command=self.left())
leftBtn.pack(side=tk.LEFT)
rightBtn = tk.Button(self, text="RIGHT",
                 width=10, command=self.right())
rightBtn.pack(side=tk.LEFT)
```

```
d) leftBtn = tk.Button(self, text="LEFT",
                width=10, command=left)
leftBtn.pack(side=tk.LEFT)
rightBtn = tk.Button(self, text="RIGHT",
                 width=10, command=right)
rightBtn.pack(side=tk.LEFT)
```

e) More than one of the above is correct.

(2019s1 Q36-37)

316-317. The next two questions relate to the following simple GUI application. The application has two buttons and a label. The label is initially “Good Day”. When started, the GUI appears as in the image below.

Clicking on the button labelled “Aussie”, changes the label to be “G’ Day”. Clicking on the button labelled “French”, changes the label to be “Bonjour”. The code is provided below.

Python

```python
import tkinter as tk

class App(object) :

    def __init__(self, master) :
        """Initialise the window layout with a greeting label
           and buttons to change the greeting language.

        Parameters:
            master (Tk): Main window for application.
        """
        master.title("Exam")
        master.geometry('240x100')
        self._label = tk.Label(master, text="Good Day")
        self._label.pack()
        ## code block 1 ##
        ## code block 2 ##
        self._canvas = tk.Canvas(master)
        self._canvas.pack()

    def _set_greeting(self, greeting) :
        self._label.config(text=greeting)

    def _aussie_greeting(self) :
        self._set_greeting("G'Day")

    def _french_greeting(self) :
        self._set_greeting("Bonjour")

```

(2019s1 Q36) 316. What is the required code for ## code block 1 ##?

a) english_btn = tk.Button(master, text="Aussie", width=10,

command=_aussie_greeting())

french_btn = tk.Button(master, text="French", width=10,

command=_french_greeting())

```
b) english_btn = tk.Button(master, text="Aussie", width=10,
                     command=_aussie_greeting)
french_btn = tk.Button(master, text="French", width=10,
                    command=_french_greeting)
c) english_btn = tk.Button(master, text="Aussie", width=10,
                     command=self._aussie_greeting())
french_btn = tk.Button(master, text="French", width=10,
                    command=self._french_greeting())
d) english_btn = tk.Button(master, text="Aussie", width=10,
                     command=self._aussie_greeting)
french_btn = tk.Button(master, text="French", width=10,
                    command=self._french_greeting)
```

e) More than one of the above is correct.

(2019s1 Q37) 317. What is the required code for ## code block 2 ##?

```
a) english_btn.pack(side=tk.BOTTOM, padx=20)
french_btn.pack(side=tk.BOTTOM, padx=20)
b) english_btn.pack(side=tk.LEFT, padx=20)
french_btn.pack(side=tk.RIGHT, padx=20)
c) english_btn.pack(side=tk.BOTTOM)
french_btn.pack(side=tk.BOTTOM)
d) english_btn.pack(side=tk.LEFT)
french_btn.pack(side=tk.RIGHT)
```

e) More than one of the above is correct.

(2019s2 Q37-38)

317-318. The next two questions relate to the following partial implementation of a GUI. The application has two buttons in a frame and custom canvas on which the circle can be moved left or right by clicking on the buttons. The completed GUI is shown in the image below.

Python

```python
import tkinter as tk

class Screen(tk.Canvas):
    def __init__(self, parent):
        super().__init__(parent, bg="light blue",
                         width=150, height=150)
        self._x, self._y = (width / 2, height / 2)
        self._redraw()
    def _redraw(self):
        """Redraw the screen after a move."""
        self.delete(tk.ALL)

        ## code block 1 ##

    def _move(self, dx, dy):
        """Move the circle by a given amount."""
        self._x += dx
        self._y += dy
        self._redraw()
    def move_left(self):
        self._move(-5, 0)
    def move_right(self):
        self._move(5, 0)



class Controls(tk.Frame):
    BUTTON_WIDTH = 10
    def __init__(self, parent, left, right):
        """Parameters:
            parent (Tk): Window for widget.
            left (method): Callback for "left button".
            right (method): Callback for "right button".
        """
        super().__init__(parent)

        ## code block 2 ##

class GameApp(object):
    def __init__(self, master):
        master.title("Game")
        screen = Screen(master)
        controls = Controls(master, screen.move_left,
                            screen.move_right)
        controls.pack(side=tk.LEFT)
        screen.pack(side=tk.LEFT, expand=True,
                    fill=tk.BOTH)

```

(2019s2 Q37) 317. What is the required code for ## code block 1 ##?

a) coords = (self._x - 5, self._y - 5, self._x + 5, self._y + 5)

create_oval(coords, fill="black", width=0)

b) coords = (self._x - 5, self._y - 5, self._x + 5, self._y + 5)

self.create_oval(coords, fill="black", width=0)

c) coords = (self._x - 5, self._y - 5, self._x + 5, self._y + 5)

Canvas.create_oval(coords, fill="black", width=0)

d) coords = (self._x - 5, self._y - 5, self._x + 5, self._y + 5)

super().create_oval(coords, fill="black", width=0)

e) More than one of the above is correct.

(2019s2 Q38) 318. What is the required code for ## code block 2 ##?

(a)

left_btn = tk.Button(self, text="LEFT", width=10, command=left())

left_btn.pack(side=tk.LEFT)

right_btn = tk.Button(self, text="RIGHT", width=10, command=right())

right_btn.pack(side=tk.LEFT)

(b)

left_btn = tk.Button(self, text="LEFT", width=10, command=Screen.left())

left_btn.pack(side=tk.LEFT)

```
right_btn = tk.Button(self, text="RIGHT", width=10, command=Screen.right())
right_btn.pack(side=tk.LEFT)
```

c)

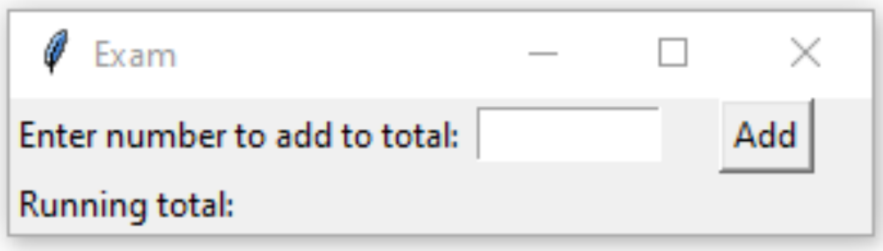
```
left_btn = tk.Button(self, text="LEFT", width=10, command=self.left())
left_btn.pack(side=tk.LEFT)
right_btn = tk.Button(self, text="RIGHT", width=10, command=self.right())
right_btn.pack(side=tk.LEFT)
```

d)

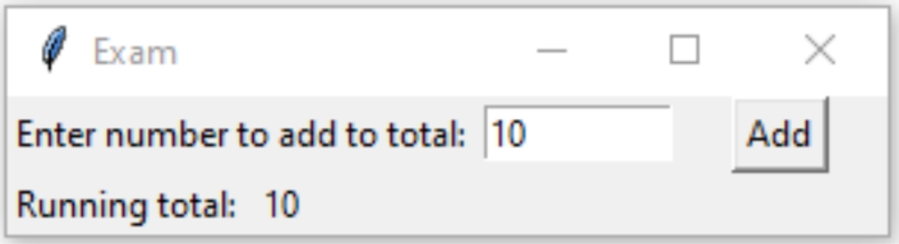
```
left_btn = tk.Button(self, text="LEFT", width=10, command=left)
left_btn.pack(side=tk.LEFT)
right_btn = tk.Button(self, text="RIGHT", width=10, command=right)
right_btn.pack(side=tk.LEFT)
```

e) More than one of the above is correct.

The next two questions relate to the following simple GUI application. The application has a text field into which users can enter numbers. When started, the GUI appears as in the image below.



When the user presses the Add button, the value in the text field is added to the running total and displayed, as shown in the image below.



Enter number to add to total: 10

Running total: 10

The code, with two missing code fragments, is provided below.

Python

```python
class Input(tk.Frame):
    def __init__(self, parent: tk.Tk, add_event_handler):

        super().init(parent)
        prompt = tk.Label(self, text="Enter number to add to total: ")
        prompt.pack(side=tk.LEFT)

        self._entry = tk.Entry(self, width=10)
        self._entry.pack(side=tk.LEFT)

        ## Fragment 1 ##
        add_button.pack(side=tk.LEFT, padx=20)


    def get_input(self) -> int:
        return int(self._entry.get())


class Add:
    def __init__(self, master: tk.Tk):
        master.title("Exam")
        self._total = 0
        self._input_frame = Input(master, self.add)
        self._input_frame.pack(side=tk.TOP)

        total_label = tk.Label(master, text="Running total: ")
        total_label.pack(side=tk.LEFT)
        self._result = tk.Label(master)
        self._result.pack(side=tk.LEFT)


    def add(self) -> None:
        ## Fragment 2 ##
```

(2021s1 Q37) 37. What is the required code for ## Fragment 1 ##?

a) add_button = tk.Button(self, text="Add", command=Add())

b) add_button = tk.Button(self, text="Add", command=Add.add)

c) add_button = tk.Button(self, text="Add", command=self.get_input)

d) add_button = tk.Button(self, text="Add", command=add_event_handler)

e) None of the code fragments would implement the GUI correctly.

(2021s1 Q38) 38. What is the required code for ## Fragment 2 ##?

a) self._total += self.get_input()

self._result.config(text=str(self._total))

b) self._total += self._input_frame.get_input()

self._result.config(text=str(self._total))

c) self._total += self._input_frame._entry.get()

self._result.config(text=str(self._total))

d) self._total += self._input_frame.get_input()

self._result.config(text=str(self._input_frame.get_input()))

e) None of the code fragments would implement the GUI correctly.

题型十四：时间复杂度

(2015s1 Q38) 344. What is the time complexity, in terms of the length of the list xs for the following function that reverses the elements of a list. You may assume inser ting an element at position 0 is linear in the length of the list.

Python

```python
def reverse(xs):
    result = []
    for x in xs:
        result.insert(0, x)
    return result
```

(a) Constant

(b) Logarithmic

(c) Linear

(d) Quadratic

(e) Exponential

(2015s1 Q39) 345. What is the time complexity, in terms of the length of the list xs for the following function that checks to see if xs has an increasing sublist of at least n elements. You may assume list indexing and calculating the length of a list are constant time and range is linear in the length of the range.

Python

```python
def contains_increasing(xs, n):
    """Returns True iff xs contains an increasing sublist
    with at least n elements
    Precondition: len(xs) > 2 and n > 1
    """
    v = xs[0]
    c = 1
    for i in range(1, len(xs)):
        if xs[i] > v:
            c += 1
            if c == n:
                return True
        else:
            c = 0
        v = xs[i]
    return False
```

(a) Constant

(b) Logarithmic

(c) Linear

(d) Quadratic

(e) Exponential

(2015s2 Q38) 346. What is the time complexity, in terms of the length of the list xs for the following function that tests to see if the list has repeated elements? You may assume accessing elements of a list, and the arithmetic operations and test are all constant time operations.

Python

```python
def has_repeats(xs):
    """Return True iff xs has repeated elements.
EG
    has_repeats([2,1,3,4]) == False
    has_repeats([1,2,1,4])     == True
    has_repeats(list(X)) => bool """
    size = len(xs)
    for i in range(size-1):
        e = xs[i]
        for j in range(i+1,size):
            if e == xs[j]:
                return True
    return False
```

(a) Constant

(b) Logarithmic

(c) Linear

(d) Quadratic

(e) Exponential

(2015s2 Q39) 347. What is the time complexity, in terms of the length of the string, of the following function that tests a string to see if it is a palindrome (i.e. a string that can be read the same way in either direction) such as "radar"? You may assume accessing elements of a string, calculating the length of a string and the arithmetic are constant time operations.

Python

```python
def isPalindrome(string):
    """Return True iff string is a palindrome"""
    size = len(string)
    half = size/2
    i = 0
    while i < half:
    if string[i] != string[size-1-i]:
        return False
    i += 1
    return True
```

(a) Constant

(b) Logarithmic

(c) Linear

(d) Quadratic

(e) Exponential

(2017s1 Q40) 348. What is the time complexity, in terms of the length of the string, of the following function that tests a string to see if it is a palindrome (i.e. a string that can be read the same way in either direction) such as "radar"? You may assume accessing elements of a string, calculating the length of a string and

the arithmetic are constant time operations.

Python

```python
def is_palindrome(string) :
    """Return True iff 'string' is a palindrome."""
    size = len(string)
    half = size / 2
    i = 0
    while i < half:
        if string[i] != string[size-1-i] :
            return False
        i += 1
    return True
```

a) Constant

b) Logarithmic

c) Linear

d) Quadratic

e) Exponential

(2017s1 Q38) 349. What is the time complexity, in terms of the length of the list for the function below? You may assume accessing elements of a list, and the arithmetic operations and tests are all constant time operations.

Python

```python
def has_repeats(list) :
    """Return True iff 'list' has repeated elements."""
    size = len(list)
    for i in range(size-1) :
        element = list[i]
        for j in range(i+1, size) :
            if element == list[j] :
                return True
    return False
```

a) Constant

b) Logarithmic

c) Linear

d) Quadratic

e) Exponential

(2018s1 Q39) 350. What is the time complexity, in terms of the length of the list of values, of the following function that returns double the total of all the values in the list? You may assume accessing elements of a list, determining the length of a list and arithmetic operations are all constant time operations.

Python

```python
def double(values) :
    """Double the sum of all numbers in 'values'."""
    result = 0
    for element in values :
        result += element
    for element in values :
        result += element
    return result
```

a) Constant

b) Logarithmic

c) Linear

d) Quadratic

e) Exponential

(2018s1 Q40) 351. What is the time complexity, in terms of the value of exponent, of the following function that calculates exponentiation? You may assume logical comparisons and arithmetic operations are all constant time operations.

Python

```python
def exponentiation(num, exponent) :
    """Calculate 'num' raised to the 'exponent'."""
    result = 1
    while exponent > 0 :
        if exponent % 2 == 0 :
            num = num * num
            exponent /= 2
        else :
            exponent -= 1
            result *= num
    return result
```

a) Constant

b) Logarithmic

c) Linear

d) Quadratic

e) Exponential

(2019s1 Q38) 352. What is the time complexity, in terms of the length of the list of values, of the following function that returns the index of the largest value in the list? You may assume accessing elements of a list, determining the length of a list and arithmetic operations are all constant time operations.

Python

```python
def find_largest(values) :
    """Returns position of the largest number in 'values'.
    Parameters:
        values (list[float]): List of numbers.
    Return:
        (int) Position of the largest number in 'values'.
    Pre-condition:
        values is not an empty list.
    """
    largest_position = 0
    index = 1
    while index < len(values) :
        if values[index] > values[largest_position] :
            largest_position = index
        index += 1
    return largest_position
```

a) O(1) – Constant

b) O(log n) – Logarithmic

c) O(n) – Linear

d) O(n2) – Quadratic

e) O(2n) – Exponential

(2019s1 Q39) 353. What is the time complexity, in terms of the length of the list of values, of the following function that returns the index of the largest value in the list? You may assume accessing elements of a list, determining the length of a list and arithmetic operations are all constant time operations.

Python

```python
def is_leap_year(year) :
    """Check if 'year' is a leap year.
    Parameters:
        year (int): Year to check if it is a leap year.
    Return:
        (bool) True if 'year' is a leap year, False otherwise.
    Pre-condition:
        year > 0
    """
    if year % 400 == 0 :
        return True
    elif year % 100 == 0 :
        return False
    elif year % 4 == 0 :
        return True
    else :
        return False
```

a) O(1) – Constant

b) O(log n) – Logarithmic

c) O(n) – Linear

d) O(n2) – Quadratic

e) O(2n) – Exponential

The next two questions relate to the following function definition. The function returns a tuple indicating how many positive, zero and negative values were in the list passed as a parameter to values.

Python

```python
def partition(values: list[int]) -> tuple[int, int, int]:
    positives = 0
    zeros = 0
    negatives = 0
    for value in values:
        if value == 0:
            zeros += 1
        elif value > 0:
            positives += 1
        else:
            negatives += 1
    return (positives, zeros, negatives)
```

(2021s1 Q39) 39. What is the time complexity, in terms of the logical complexity of the partition function? You may assume arithmetic and comparison operations are constant time operations.

a) O(1) – Constant

b) O(log n) – Logarithmic

c) O(n) – Linear

d) O(n2) – Quadratic

e) O(2n) – Exponential