CSCI1200 Python Practice Exercises (Basics)

By: Dr. Ming Ming Tan. Not to be sold, published, or distributed without the authors' consent.

These are self-practice exercises for beginners. These exercises are easier than the lab and exam questions. The purpose of these exercises is to ensure that you have mastered the minimum basics of programming.
You are asked to work out these exercises by hand, rather than implementing them.

Expression

1. Consider the following code. What is the output?

```
a = 200
2*a+1
```

2. Consider the following code. What is the output?

```
b = 4
4**0.5
```

3. Consider the following code. What is the output?

```
4>14
```

4. Consider the following code. What is the output?

```
4<14
```

5. Consider the following code. What is the output?

```
a=17
a%2
```

6. Consider the following code. What is the output?

```
a=14
```

```
a%2
```

7. Consider the following code. What is the output?

```
a=14
a%3
```

8. Consider the following code. What is the output?

```
a=14
a%12
```

9. Consider the following code. What is the output?

```
True and False
```

10. Consider the following code. What is the output?

```
True or False
```

11. Which of the following values of `a` will the following expression be evaluated to `True`?

```
(a%3==0) and (a%5==0)
```

(a) `a` = 3
(b) `a` = 5
(c) `a` = 15
(d) `a` = 25

12. Which of the following values of `a` will the following expression be evaluated to `True`?

```
(a%3==0) and not (a%5==0)
```

(a) `a` = 3
(b) `a` = 5
(c) `a` = 15
(d) `a` = 25

13. Consider the following code. What is the output?

```
a, b, c = 1, 2, 4
```

```
x = 3
a*x**2 + b*x + c
```

Function

1a. Consider the following function:

```
def test(x):
  return x%2==0
```

What is the value of
(1) `test(4)`
(2) `test(7)`

1b. The function `test` above takes an input parameter `x` and returns `True` if `x` is even. Is this statement true or false?

2. Complete the following function `test` such that given an input parameter `x` which represents an integer, return `True` if `x` is odd else return `False`.

```
def test(x):
  return
```

3a. Consider the following function:

```
def test(x):
  return x%3==0
```

What is the value of
(1) `test(4)`
(2) `test(7)`

3b. The function `test` above takes an input parameter `x` and returns `True` if `x` is a multiple of three. Is this statement true or false?

4. Complete the following function `test` such that given an input parameter `x` which represents an integer, return `True` if `x` is a multiple of 5 else return `False`.

```
def test(x):
  return
```

5. Consider the following function:

```
def test(x,y,z):
  return x*y+z
```

What is the value of
(1) `test(4,3,2)`
(2) `test(7,1,2)`

6. Complete the following function `test` that takes parameters `a`, `b` and return a^b.

```
def test(a,b):
  return
```

7. Complete the following function `test` that takes parameters `a`, `b` and return $a \bmod b$.

```
def test(a,b):
  return
```

8. Complete the following function `test` that takes parameters `a`, `b`, `c`, and `d` and return the average of them. (sum of the four parameters then divide by 4)

```
def test(a,b,c,d):
  return
```

If

1. Consider the following function:

```
def test(x):
  if x%3==0:
    print("Divisible by three")
  if x%5==0:
    print("Divisible by five")
```

What is the output?
(1) `test(12)`

(2) `test(25)`
(3) `test(15)`

2. Consider the following function:

```
def test(x):
  if x%3==0:
    print("Divisible by three")
  else:
    print("Not divisible by 3")

  if x%5==0:
    print("Divisible by five")
  else:
    print("Not divisible by five")
```

What is the output?
(1) `test(12)`
(2) `test(25)`
(3) `test(15)`

3. Consider the following function:

```
def test(x):
  if x%3==0:
    print("Divisible by three")
  elif x%5==0:
    print("Divisible by five")
  else:
    print("Not divisible by five and three")
```

What is the output?
(1) `test(12)`
(2) `test(25)`
(3) `test(15)`

4. Consider the following function:

```
def test(x):
  if x%15==0:
    print("Divisible by fifteen")
  elif x%3==0:
    print("Divisible by three but not by five")
  elif x%5:
    print("Divisby by five but not by three")
  else:
    print("Not divisible by five and three")
```

What is the output?

(1) `test(12)`

(2) `test(25)`

(3) `test(15)`

5. Complete the following function `test` that takes an integer `n` and do the following:

- If `n` is divisible by 2, display "The number is even" otherwise,
- If `n` is divisible by 3, display "The number is divisible by three", otherwise,
- If `n` is divisible by 5, display "The number is divisible by five", otherwise,
- display "The smallest positive divisor of `n` is greater than five".

```
def test(n):
  if (n%2==0):
    print("The number is even")
  elif (                      ):


  elif (                      ):


  else:

```

6. Consider the following function:

```
def test(n):
  if (n%2==0):
    return n//2
  else:
    return 2*n+1
```

What is the output?

(1) `test(12)`
(2) `test(25)`

7. Consider the following function:

```
def test(n):
  if n<3:
    print("Less than three")
  elif n< 6:
    print("Between three and five, inclusive")
  else:
    print("Greater or equal to 6")
```

What is the output?

(1) `test(2)`
(2) `test(3)`
(3) `test(4)`
(4) `test(5)`
(5) `test(6)`
(6) `test(11)`

8. Consider the following function. Complete the function with appropriate numbers in _____.

```
def test(n):
  if n<13:
    print("Less than ____")
  elif n< 16:
    print("Between ________ and ________, inclusive")
  else:
    pri
```

9a. Consider the following function.

```
def test(n):
  if n>=1 and n<=5:
    print("A")
  else:
    print("B")
```

What is the output of
(a) `test(3)`
(b) `test(-1)`
(c) `test(6)`

9b. In order for the above function to print out appropriate properties of `n` . We should have “A” be replaced by “Between 1 and 5, inclusive”. Which of the following statement should “B” be replaced with? Choose the most appropriate statement.
(a) “At least 6”
(b) “Less than 1”
(c) “Less than 1 and greater or equal to 6”.

10. Complete the following function `test` that takes an integer `n` and do the following:
    - If `n` is is between 1 and 10 (inclusive), return `n`, otherwise, divide `n` by 2 and return the number.

```
def test(n):




```

11a. Consider the following function.

```
def test(n):
  if (n%0==2) and (n%3==0)
    print("A")
  else:
    print("B")
```

What is the output of
(a) `test(3)`
(b) `test(2)`
(c) `test(6)`
(d) `test(5)`

11b. In order for the above function to print out appropriate properties of `n` . We should have “A” be replaced by “Divisible by 2 and 3”. Which of the following statement should “B” be replaced with? Choose the most appropriate statement.
(a) “Odd”
(b) “Not divisible by 3”
(c) “Odd and not divisible by 3”.
(c) “Odd or not divisible by 3”.

12. Complete the following function `test` that takes an integer `n` and do the following:

- If `n` is is between odd and is divisible by 5, return `n`, otherwise, divide `n` by 2 and return the number.

```
def test(n):
```

13. Consider the following function:

```
def test(n):
  if n%3==0:
    if(n%5==0):
      print("A")
    else:
      print("B")
  else:
    if(n%5==0):
      print("C")
    else:
      print("D")
```

What is the output?
(1) `test(12)`
(2) `test(25)`
(3) `test(15)`
(4) `test(37)`

14. Consider the following function.

```
def test(n):
  if n%3==0:
    if(n%5==0):
      print("A")
    else:
      print("B")
  else:
    if(n%5==0):
      print("C")
    else:
      print("D")
```

In order for the function to print out appropriate statement on the properties of `n` . Each of the “A”, “B”, “C”, “D” should be replaced with one of the following statements:
The statements are:

- statement 1: “Divisible by three but not five”
- statement 2:“Divisible by three and five”
- statement 3:“Not divisible by three but divisible by five”
- statement 4: “Not divisible by three and five”

“A” should be replaced with statement 2.
“B” should be replaced with statement __.
“C” should be replaced with statement __.
“D” should be replaced with statement __.

15. Complete the following function `test` that takes an input `x` and do the following:

- if x is negative, return the negative of x^3, otherwise return x^3.

```
def test(x):
```

String

1. Given a string `text = "text"`. What is the output of

(a) `text[0]`
(b) `text[1]`
(c) `text[2]`
(d) `text[3]`
(e) `text[4]`
(f) `text[-1]`
(g) `len(text)`

2. Complete the following function `test` that takes a string `text` and an integer `i` as inputs and and returns the value at `i`-index of `text`.

```
def test(text, i):
  return
```

3a. Consider the following code:

```
def test(text):
  return text[0]==text[-1]
```

What is the output:

(a) `test("hello")`
(b) `test("lol")`
(c) `test("a")`

3b. The function `test` above takes an input parameter `text` and returns `True` if the first element of `text` is equal to the last element of `text`. Is this statement true or false.

4. Complete the following function `test` that takes a string `text` and return `True` if the first element of `text` is the same as the second element of `text`. We assume that `text` has at least two characters.

```
def test(text):
  return
```

5. Given a string `text = "text"`. What is the output of

(a) `text[:]`
(b) `text[0:2]`
(c) `text[1:2]`
(d) `text[1:3]`
(e) `text[::2]`
(f) `text[:-1]`
(g) `text[1:-1]`
(h) `text[::-1]`
(i) “e” in text
(j) “E” in text

6. Complete the following function `test` that takes a string `text` and returns a new string by removing the first and last character of `text`.

```
def test(text):
  return
```

7. Complete the following function `test` that takes a string `text` and returns a new string which is the reverse order of `text`.

```
def test(text):
  return
```

8. What is the output of

```
text = "text"

text + text
```

9. What is the output of

```
text = "text"

text * 3
```

10. What is the output of

```
text1 = "text"

text2 = "message"

text1 + text2
```

11. Complete the following function `test` that takes two string `text1` and `text2` and returns a new string which is the concatenation of the two input strings.

```
def test(text1, text2):

  return
```

12. Complete the following function `test` that takes two string `text1` and `text2` and returns a new string which is the concatenation of the two input strings, separated by a space.

```
def test(text1, text2):

  return
```

13. Complete the following function `test` that takes a string `text` and a positive integer `k` and returns a new string which is the repetition of `text` `k` times.

```
def test(text, k):

  return
```

If and String

1. Consider the following code.

```
def test(text):
  if text[0]=="A":
      print("Starts with A")
  else:
      print("Not start with A")
```

What is the output:

(a) `test("Abc")`
(b) `test("abc")`
(c) `test("bcA")`

2. Complete the following function `test` which takes an input string `text` and

- display “Ends with A” if `text` ends with “A” otherwise display “Not end with A”.

```
def test(text):
  if ________________:
      print("Ends with A")
  else:
      print("Not end with A")
```

3. Consider the following code.

```
def test(text):
  if text[0]=="A":
      print("Starts with A")
  elif text[0]=="B":
      print("Starts with B")
  else:
      print("Not start with A or B")
```

3. What is the output:

(a) `test("Abc")`
(b) `test("abc")`
(c) `test("bcA")`
(d) `test("BcA")`
(e) `test("ZcA")`

4. Complete the following function `test` which takes an input string `text` and

- display “Starts with A” if `text` starts with “A” , otherwise
- display “Starts with B” if `text` starts with “B” , otherwise
- display “Starts with C” if `text` starts with “C” , otherwise
- display “Not start with A or B"

```
def test(text):

```

5a. Consider the following code:

```
def test(text):
  if text[0]==text[-1]:
    return text[1:-1]
  else:
    return text
```

What is the output of

(a) `test("text")`

(b) `test("pest")`

5b. Which of the following describe the function `test` above:

(a) If the first element of `text` is the same as the last element of `text` return the new string by removing the first and last element of `text`.

(b) If the first element of `text` is the same as the last element of `text` return the new string by reversing the element in `text`.

(d) If the first element of `text` is the not the same as the last element of `text` return the new string by removing the first and last element of `text`.

(e) If the first element of `text` is the not the same as the last element of `text` rreturn the new string by reversing the element in `text`.

6. Complete the following function `test` which takes an input string `text` and

- if the first element of `text` is the same as the last element of `text`, return a new string by removing the last element of `text`, otherwise

- return the string `text`

```
def test(text):
```

7. Consider the following code:

```
def test(text,i):
  if i<len(text) and i>=0:
    return text[i]
  else:
    return "Invalid index"
```

1. What is the output of

(a) `test("text", 3)`

(b) `test("text", 5)`

(c) `test("text", -1)`

8. Complete the following function `test` which takes an input string `text` and a non-negative integer `i`.

- If `i` is less than the length of `text`, return the value at the `i`-th index of `text`, otherwise
- Change `i` to `i` modulo the length of `text` and return the value at the `i`-th index of `text`,

```
def test(text, i):
```

Loops I

1. Consider the following code

```
def test(n):
  for i in range(n):
    print(i)
```

What is the output of `test(4)`?

2. Consider the following code

```
def test(n):
  for i in range(n):
    print(i+1)
```

What is the output of `test(4)`?

3. Consider the following code

```
def test(n):
  for i in range(n):
    print(2*i)
```

What is the output of `test(4)`?

4. Consider the following code

```
def test(n):
  for i in range(1,n):
    print(i)
```

What is the output of `test(4)`?

5. Consider the following code

```
def test(n):
  for i in range(1,n,2):
    print(i)
```

What is the output of `test(4)`?

6. Consider the following code

```
def test(n):
  for i in range(1,n,3):
    print(i)
```

What is the output of `test(4)`?

6. Consider the following code

```
def test(n):
  i=0
  while(i<n):
    print(i)
    i+=1
```

What is the output of `test(4)`?

7. Consider the following code

```
def test(n):
  i=1
  while(i<n):
    print(i)
    i+=1
```

What is the output of `test(4)`?

8. Consider the following code

```
def test(n):
  i=1
  while(i<n):
    print(i)
    i+=2
```

What is the output of `test(4)`?

9. Consider the following code

```
def test(n):
  i=1
  while(i<n):
    print(i)
    i+=3
```

What is the output of `test(4)`?

10. Consider the following code

```
def test(n):
  i=n
  while(i>=0):
    print(i)
    i-=1
```

What is the output of `test(4)`?

11. Consider the following code

```
def test(n):
  i=n
  while(i>=0):
    i-=1
    print(i)
```

What is the output of `test(4)`?

12. Complete the following `test` function which takes two input integers `m` and `n` and print all integers from `m` to `n`, inclusive.

```
def test(m,n):



```

Loops and If

1. Consider the following function

```
def test(n):
  for i in range(n):
    if(i%2==1):
      print(i)
```

What is the output of `test(4)`?

2. Consider the following function

```
def test(n):
  for i in range(n):
    if(i%2==1):
      print(i+1)
```

What is the output of `test(4)`?

3. Consider the following function

```
def test(n):
  for i in range(n):
    if(i%2==1):
      print(2*i)
```

What is the output of `test(4)`?

4. Consider the following function

```
def test(n):
  for i in range(n):
    if(i%2==1):
      print(2*i)
    else:
      print(i)
```

What is the output of `test(4)`?

Loops II (Accummulate)

1a. Consider the following function

```
def test(n):
  sum = 0
  for i in range(n):
     sum+=1
  return sum
```

What is the output of `test(4)`?

1b. Consider the following function

```
def test(n):
  sum = 0
  for i in range(n):
     sum+=i
  return sum
```

What is the output of `test(4)`?

1c. Given an integer number `n`, what is the value of `test(n)`? Choose the right answer.
(a) sum of all elements from 1 to `n`-1.
(b) sum of all elments from 1 to `n`.

2a. Consider the following function

```
def test(n):
  sum = 0
  for i in range(n):
     sum-=i
  return sum
```

What is the output of `test(4)`?

2b. Given an integer number `n`, what is the value of `test(n)`? Choose the right answer.
(a) sum of all elements from 1 to `n`-1.
(b) sum of all elments from 1 to `n`.
(a) negative of sum of all elements from 1 to `n`-1.
(b) negative of sum of all elments from 1 to `n`.

3a. Consider the following function

```
def test(n):
  sum = 0
  for i in range(n):
    if(i%2==0):
      sum+=i
  return sum
```

What is the output of `test(5)`?

3b. Given an integer number `n`, what is the value of `test(n)`? Choose the right answer.

(a) sum of all elements from 1 to `n`-1.
(b) sum of all elments from 1 to `n`.
(a) sum of all even elements from 1 to `n`-1.
(b) sum of all even elments from 1 to `n`.
(a) sum of all odd elements from 1 to `n`-1.
(b) sum of all odd elments from 1 to `n`.

4. Complete the following function `test` which takes an input integer `n` and returns the sum of all positive integers from 0 to `n`, inclusive.

```
def test(n):
```

Loops and String/List

1. Consider the following code.

```
def test(text):
  for c in text:
    print(c)
```

What is the output of `test("hello")`?

2. Consider the following code.

```
def test(text):
  i=0
  while i<len(text):
    print(text[i])
    i+=1
```

What is the output of `test("hello")`?

3. Consider the following code.

```
def test(text):
  i=len(text)-1
  while i>=0:
    print(text[i])
    i-=1
```

What is the output of `test("hello")`?

4. Consider the following code.

```
def test(text):
  for c in text[::-1]:
    print(c)
```

What is the output of `test("hello")`?

5. Consider the following code.

```
def test(text, key):
  for c in text:
    if key==c:
      return True
  return False
```

What is the output of

(a) `test("hello", "h")`

(b) `test("hello", "o")`

(c) `test("hello", "c")`

5. Consider the following code.

```
def test(text, key):
  for c in text:
    if key==c:
      return True
    else:
      return False
```

What is the output of

(a) `test("hello", "h")`

(b) `test("hello", "o")`

(c) `test("hello", "c")`

6a. Consider the following code.

```
def test(text, key):
  counter = 0
  for c in text:
    if key==c:
      counter+=1
  return counter
```

What is the output of

(a) `test("hello", "h")`

(b) `test("hello", "o")`

(c) `test("hello", "l")`

6b. Which of the following about the `test` function above is true. There could be more than one true statements.

(a) For any valid inputs, the output is always non-negative.

(b) If `key` is in `text`, the output is always positive.

(c) if `key` is not in `text`, the output is zero.

(d) The output is the number of times `key` is in `text`.

7a. Consider the following code.

```
def test(text):
  for i in range(len(text)):
    if text[i]!=text[len(text)-i-1]:
      return False
   return True
```

What is the output of

(a) `test("abc")`
(b) `test("aba")`
(c) `test("a")`
(d) `test("abca")`

7b. The function `test` above return True if (select all tha applies)

(a) `text` is a palindrome (reads the same backward as forward).
(b) `len(text)` is 1.
(c) the first element of `text` is the same as the last element of `text`.
(d) the first element of `text` is not the same as the last element of `text`.

8a. Consider the following code.

```
def test(text):
  for i in range(1,len(text)):
    if text[i]!=text[i-1]:
      return False
   return True
```

What is the output of

(a) `test("aa")`
(b) `test("aba")`
(c) `test("a")`

8b. The function `test` above return True if (select all tha applies)

(a) `text` is a palindrome (reads the same backward as forward).
(b) `len(text)` is 1.
(c) the first element of `text` is the same as the last element of `text`.
(d) the first element of `text` is not the same as the last element of `text`.

(e) `len(text)` is 0.

(f) `text` is formed by a repetition of the same value.