CSC 120 Practice Midterm
Instructor: Katie Fraser
Fall 2016

Last name:                      First name:

Utorid:                        Student ID number:

Do not turn this page until you have received the signal to start.
(Please fill out the identification section above, write your name on the back of the test, and read the instructions below.)

Good Luck!

• You have 50 minutes to write the test.
• You are not permitted any aids, notes, books, or calculators.
• This exam is out of 25 points.
• There are eight pages in this booklet.
• Comments are not required except where indicated, although they may help us mark your answers.
• If you use any space for rough work, indicate clearly what you want marked.
• Do not remove any pages from the exam booklet.
• You may use a pencil; however, work written in pencil will not be considered for remarking.
• As always, you are expected to adhere to the U of T student code of academic conduct.

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Question 1 (6 marks)

Write the following functions, including a docstring with two examples which are different from the examples given in the descriptions.

Part A (3 marks)

Write a function called `square_elements` which takes a list of numbers as input and outputs a new list, in which each element is the corresponding element of the input list squared. For example, if the input was `[1, 2, 3]`, the output would be `[1, 4, 9]`.

Part B (3 marks)

Write a function called `compress` which takes a string as input, and returns a new string the same as the input string, but with all the spaces removed. Requirement: do not use the string method `replace()`. For example, if the input was `'This is an example '`, the output would be `'Thisisanexample'`.
Trace through this code:

1. What does this program print?

2. What happens if line 7 is uncommented? If an error, what kind, and why? If no error, what does the whole program now print, and why?

3. What happens if line 11 is uncommented? (Assume line 7 is commented.) If an error, what kind, and why? If no error, what does the whole program now print, and why?

4. What happens if line 13 is uncommented? (Assume lines 7-11 are commented.) If an error, what kind, and why? If no error, what does the whole program now print, and why?
Question 3 (4 marks)

We have two monkeys, a and b, and the parameters `a_smile` and `b_smile` indicate if each is smiling. We are in trouble if they are both smiling or if neither of them is smiling. Return `True` if we are in trouble.

```python
def monkey_trouble(a_smile, b_smile):
    """(bool, bool) -> bool
    monkey_trouble(True, True) True
    monkey_trouble(False, False) True
    monkey_trouble(True, False) False
    """
```
Question 4 (5 marks)

Complete the function according to its docstring description.

```python
def get_hash_symbol_indices(s):
    """(str) -> list of int
    Return a list containing the index of each '#' in s.
    >>> s = '#UofT grad students #startup makes it easier for artists'
    >>> get_hash_symbol_indices(s)
    [0, 20]
    >>> s = 'There are many #Harvard & #graduate #school #alumni on #Twitter'
    >>> get_hash_symbol_indices(s)
    [15, 26, 36, 44, 55]
    >>> s = '@UofTHacks do not worry, I will handle the twitter feeds!'
    >>> get_hash_symbol_indices(s)
    []
    """
```

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1 Question 5 (5 marks)

Here are several two-line chunks of Python code. Beside each chunk, write the output it will produce. If an error would occur, write “ERROR” and a short explanation.

```python
i = 12 - 2 * 3
print(i)

x = 24 % 5
print(x)

x = 10 + int(1 / 2)
print(x)

s = 'earth'
print(len(s))

s = 'earth'
print(s[0 : 3])

s = 'earth'
print(len(s[-1]))

s = 'earth'
s[3] = 'z'
print(s)

s = 'hi' + 'there'
print(s)

b = (2 + 2 == 4)
print(b)

b = True and False
print(b)
```
[Use the space below for rough work. This page will not be marked, unless you clearly indicate the part of your work that you want us to mark.]
Short Python function/method descriptions:

举办 __builtins__:

int(x) -> int
Convert x to an integer, if possible. A floating point argument will be truncated towards zero.

len(x) -> int
Return the length of list, tuple, or string x.

print(value) --> NoneType
Prints the values.

input([prompt]) --> str
Read a string from standard input. The trailing newline is stripped. The prompt string, if given, is printed without a trailing newline before reading.

range([start], stop, [step]) -> list-like-object of int
Return the integers starting with start and ending with stop - 1 with step specifying the amount to increment (or decrement). If start is not specified, the sequence starts at 0. If step is not specified, the values are incremented by 1.

str(x) -> str
Return an object converted to its string representation, if possible.

str:

x in s --> bool
Produce True if and only if x is in s.

S.count(sub[, start[, end]]) -> int
Return the number of non-overlapping occurrences of substring sub in string S[start:end]. Optional arguments start and end are interpreted as in slice notation.

S.find(sub[, i]) --> int
Return the lowest index in S (starting at S[i], if i is given) where the string sub is found or -1 if sub does not occur in S.

S.isalpha() -> bool
Return True if and only if all characters in S are alphabetic and there is at least one character in S.

S.isalnum() -> bool
Return True if and only if all characters in S are alphanumeric and there is at least one character is S.

S.isdigit() -> bool
Return True if and only if all characters in S are digits and there is at least one character in S.

S.islower() -> bool
Return True if and only if all cased characters in S are lowercase and there is at least one cased character in S.

S.isupper() -> bool
Return True if and only if all cased characters in S are uppercase and there is at least one cased character in S.

S.lower() -> str
Return a copy of the string S converted to lowercase.

S.replace(old, new) -> str
Return a copy of string S with all occurrences of the string old replaced with the string new.

S.upper() -> str
Return a copy of the string S converted to uppercase.

list:

x in L --> bool
Produce True if and only if x is in list L

L.append(object) --> NoneType
Append object to end of list L.

L.extend(iterable) --> NoneType
Extend list L by appending elements from the iterable. Strings and lists are iterables whose elements are characters and list items respectively.