

# CMPT 120-D400 Mini Midterm Exam 1

## Fall 2022

This is a **30 minute closed book exam**: notes, books, computers, calculators, electronic devices, etc. are **not** permitted. Do not speak to any other students during their exam or look at their work. Please remain seated and **raise your hand** if you have a question.

1/3 the size!  
3/5 the fun!

## Security Codes

a) (5 marks) Write a function call `rand_digit()` that returns, as a string, a random digit (0 to 9). Import any modules required to make it work.

Make this function reasonably efficient: it shouldn't do any unnecessary work.

```
>>> rand_digit()
'4'
>>> rand_digit()
'0'
>>> rand_digit()
'4'
>>> rand_digit()
'7'
```

### Solution

```
import random                                # importing random: 1 mark

def rand_digit():                             # function header: 1 mark
    return str(random.randint(0, 9))          # indented return: 1 mark
                                              # returned as string: 1 mark
                                              # rand digit return: 1 mark

#return random.choice([0,1,2,3,4,5,6,7,8,9])
#return int(random.choice('0123456789'))
```

b) (7 marks) Write a function called `rand_digits(n)` that returns a string of `n` randomly chosen digits. Use `rand_digit()` from the previous question to help write this function. You must use a **loop** and the **accumulation pattern** in your answer.

If `n` is 0, or less, then return the empty string.

Make this function reasonably efficient: it shouldn't do any unnecessary work.

```
>>> rand_digits(3)
'824'
>>> rand_digits(10)
'3487725783'
>>> rand_digits(-2)
''
```

### **Solution**

<code>def rand_digits(n):</code>	<code># function header:</code>	<b>1 mark</b>
<code>    result = ''</code>	<code># initialization:</code>	<b>1 mark</b>
<code>    for i in range(n):</code>	<code># loop header:</code>	<b>1 mark</b>
<code>        result += rand_digit()</code>	<code># adding digit to string:</code>	<b>2 marks</b>
<code>    return result</code>	<code># return statement:</code>	<b>1 mark</b>
	<code># overall correct indentation:</code>	<b>1 mark</b>

c) (5 marks) Write a function called `security_code(style)` that returns a *string* according to these rules:

- If `style` is `'short'`, a string of 5 randomly chosen digits is returned.
- If `style` is `'long'`, a string of the form `'dddd-ddddd'`, where each *d* is a randomly chosen digit. In other words, the returned string consists of 4 random digits, followed by a `'-'`, and then 6 more random digits.
- If `style` is anything other than `'short'` or `'long'`, return the string `'error'`.

Use `rand_digits` from the previous question to help write this function.

Make this function reasonably efficient: it shouldn't do any unnecessary work.

```
>>> security_code('short')
'32461'
>>> security_code('short')
'40103'
>>> security_code('long')
'4965-106233'
>>> security_code('long')
'0581-327653'
>>> security_code('medium')
'error'
```

### Solution

<code>def security_code(style):</code>	<code># function header:</code>	<b>1 mark</b>
<code>    if style == 'short':</code>	<code># 'short' case:</code>	<b>1 mark</b>
<code>        return rand_digits(5)</code>		
<code>    elif style == 'long':</code>	<code># 'long' case:</code>	<b>1 mark</b>
<code>        return rand_digits(4) + '-' + rand_digits(6)</code>		
<code>    else:</code>	<code># else case:</code>	<b>1 mark</b>
<code>        return 'error'</code>	<code># overall indentation:</code>	<b>1 mark</b>

## Multiple Choice

For each of the following questions, fill in **the one best answer** on the answer sheet.

Every correct answer is worth 1 mark. Incorrect answers, unanswered questions, questions with more than one answer, or questions with illegible answers, are worth 0.

1) Consider these two statements:

- i) Python is popular language for data science and machine learning.
- ii) Python has a reputation for making extremely fast-running programs.

Which one of these statements most accurately describes the truth values of i) and ii)?

- A. i) and ii) are both true
- B. i) and ii) are both false
- C. i) is false and ii) is true
- D. i) is true and ii) is false

2) Consider these two statements:

- i) A Python variable name can start with a digit.
- ii) A Python variable name can contain a period character.

Which one of these statements most accurately describes the truth values of i) and ii)?

- A. i) and ii) are both true
- B. i) and ii) are both false
- C. i) is false and ii) is true
- D. i) is true and ii) is false

```
i = 0           # line 1
while i < 100:  # line 2
    print(i)    # line 3
    i += 1      # line 4
```

**Program Listing 1**

- 3) This question is about **Program Listing 1**.

What is the *last* number printed?

- A. 98
- B. 99**
- C. 100
- D. 101
- E. some other number

- 4) This question is about **Program Listing 1**.

Suppose line 3 and line 4 are swapped. What is the *last* number printed?

- A. 98
- B. 99
- C. 100**
- D. 101
- E. some other number

- 5) This question is about **Program Listing 1**.

The program would print the same output if “i = 0” in line 1 was replaced with “i=0” (i.e. spaces are removed).

- A. True**
- B. False

- 6) This question is about **Program Listing 1**.

In line 1, it’s possible to initialize i with some int value so that the loop runs forever.

- A. True
- B. False**