University of Cape Town ~ Department of Computer Science

Computer Science 1018F ~ 2008

Test 3

Question	Max	Mark	Internal	External
1	15			
2	10			
3	6			
TOTAL	30			

Marks   : 30

Time   : 40 minutes

Instructions:

   a) Answer all questions.

   b) Write your answers in the space provided.

   c) Show all calculations where applicable.

Question 1 [15]

In astronomical reckoning, the seasons begin at the solstices and equinoxes, which will here assume occur uniformly on the 21ˢᵗ of the month in question. Examine the Python unit test code below:

```
"""Unit test for Southern Hemisphere date-Season conversions"""
import Seasons
import unittest

class SuccessCheck(unittest.TestCase):
    knownValues = (( 21,3, 'Autumn'),
        (21,7, 'Winter'),
        (21,9, 'Spring'),
        (21,12, 'Summer')                      )

    def testKnown(self):
        for day,month,season in self.knownValues:
        result = Seasons.Season(day,month)
        self.assertEqual(result, season)

if __name__ == "__main__":
   unittest.main()
```

a) Unit testing is an example of black box testing. What is **black box** testing?

[2]

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b) The `SuccessCheck` class does not take the principles of equivalence testing and boundary analysis into account.

    i. Why is it a good idea to consider equivalence classes when testing a program?

[3]

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    ii. Explain how you would alter `knownValues` so that represents an appropriate set of equivalence classes and boundary values.

[3]

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c) Tests are typically divided into tests for success, tests for failure and "other" tests, such as tests for sanity.

i. What is a test for failure?

[1]

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ii. There are no checks for failure in this unit test. Give an example of a test for failure that should be added to the testing suite.

[1]

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iii. How are assertions used in tests for failure?

[1]

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iv. What is a *sanity check*?

[1]

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v. Should you add a sanity check to this testing suite? Explain your answer.

[2]

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Question 2 [10]

Complete the DateToSeason method below.   This method accepts a string consisting of a date and returns the season, using the Seasons.Season method.

e.g. DateToSeason("03/9/04") will return 'Winter'.

The date may be in one of the following formats: dd/mm/yyyy or dd/mm/yy. The separators '.', '\', ' ' and '-' are also allowed within the date string, but separator may not be mixed within a single date. Single figure entries may have the form x or 0x, e.g. 3/4/5 or 03/04/05.

```
def DateToSeason(string):
```

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Question 3 [6]

Examine the python code below:

```
startText = """In summer, when the days are long,
Perhaps you'll understand the song:
In autumn, when the leaves are brown,
Take pen and ink, and write it down."""
"""

repStr = '*'
print re.sub(regExp, repStr, startText, re.MULTILINE)
```

In each question that follows, choose the value for `regExp` that will print the displayed text.

```
In summer, when the days are l*g,

Perhaps you'll understand the s*g:

In autumn, when the leaves are br*n,

Take pen and ink, and write it d*n.
```

    A.   r'o.'
    B.   r'o[wnk]'
    C.   r'o+'
    D.   A or B

_____

a)
```
In *, when the days are long,

Perhaps you'll * the song:

In *, when the * are brown,

Take pen and ink, and write it down.
```

    A. r'\b[a-z]{6,}'
    B. r'\b[alus][a-z]*'
    C. r'[a-z]*u[a-z]*'
    D. B or C

_____

b)
```
In su*er, when the days are long,

Perhaps you'* u*d the song:

In a*mn, when the l*s are brown,

Take pen and ink, and write it down.
```

    A.   r'(mm|ll|uu)'
    B.   r'[elmnu][a-z]*[elmnu]'
    C.   r'([a-z]).*\1'
    D.   r'([a-z])[a-z]*\1'

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