

Introduction to Computing Test 1

Question 1. (10 points) Why does a computer have both main memory (RAM) and secondary memory (harddisk)?

Main memory hold program and data as it executes because it is fast, but gets wiped out when the computer is turned off.
 Secondary memory hold files for programs and data semi-permanently, but is slower

Question 2. (12 points) Indicate the resulting value and type (int, float, Boolean, long int) of evaluating each of the following expressions. For partial credit, list the order of operations.

a) $4 + 6 \div 2 + 1$ 2 / 6 3 / 10 Result: 5 Type: int

b) $16 / 2.0 ** 3$ Result: 2.0 Type: float

c) $(9.0 > 3)$ and $23 > 4 * 10.0$ True False Result: False Type: Boolean

Question 3. (13 points) Correct the following code that is suppose to average a set of scores. (You may assume that the user will enter valid numbers as inputs.)

```
numberOfScores = input("Enter the number of scores: ")
```

```
for counter in xrange(1, numberOfScores):
    total = 0.0
    nextValue = input("Enter a score: ")
    score = score + 1 total += nextValue
    if numberOfScores > 0:
        average = total / counter numberOfScores
        print "the average is", average
    else:
        print "No scores to average!"
```

Question 4. (10 points) When should you use a while loop instead of a for loop?

Use a while loop when you don't know the number of times you need to loop.

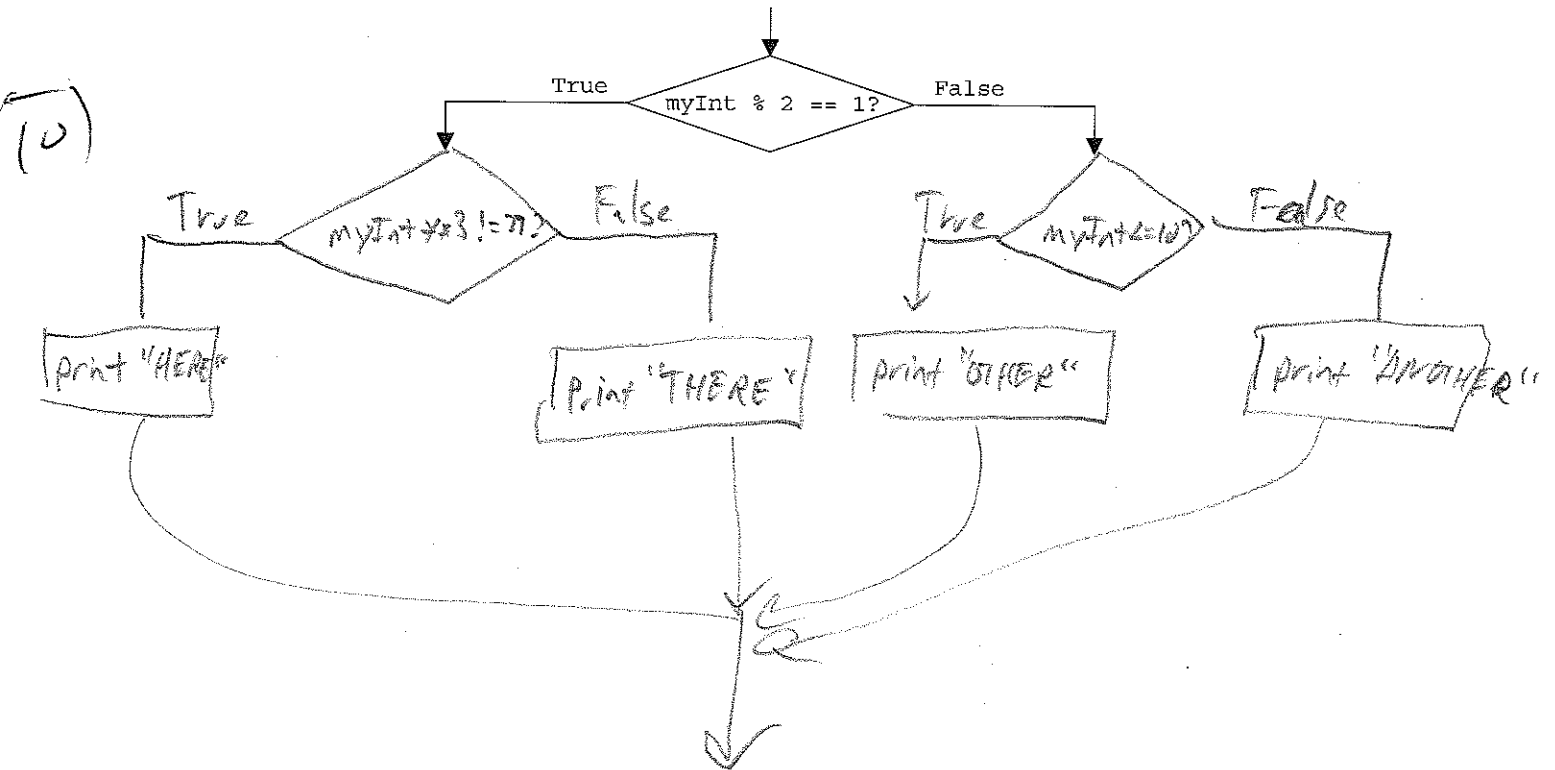
Question 5. (10 points) Consider the following program:

```

if myInt % 2 == 1:      # checks if the remainder is 1
    if myInt**3 != 27:
        print "HERE"
    else:
        print "THERE"
else:
    if myInt <= 10:
        print "OTHER"
    else:
        print "ANOTHER"
    
```

(any odd other than 3)

- a) What integer value assigned to myInt would cause the above code to print "HERE"? 5
- b) What integer value assigned to myInt would cause the above code to print "THERE"? 3
- c) What integer value assigned to myInt would cause the above code to print "OTHER"? any even # ≤ 10
- d) What integer value assigned to myInt would cause the above code to print "ANOTHER"? any even # ≥ 12
- e) Complete the flow-chart for the above code.



Question 6. (10 points)

32169421

a) Convert the binary number 0101011₂ to a decimal (base-10) value?

32 + 8 + 2 + 1 = 43₁₀

b) Convert the decimal (base-10) number 375₁₀ to a binary (base-2) value?

$$\begin{array}{r}
 375 \\
 -256 \\
 \hline
 119 \\
 -64 \\
 \hline
 55 \\
 -32 \\
 \hline
 23 \\
 -16 \\
 \hline
 7
 \end{array}$$

256 128 64 32 16 8 4 2 1
 010111011₂

Question 7. (20 points) Write a loop to validate a 'y' or 'n' response from a user to the prompt "Play again (y/n)?" Your code should force the user to enter only 'y' or 'n' by repeatedly:

- printing a helpful message if an invalid response is entered, and
- repeating the original prompt

A sample interaction would look like: (**bold** indicates the user's response)

```
Play again (y/n)? maybe
Please enter only 'y' or 'n'. Play again (y/n)? huh
Please enter only 'y' or 'n'. Play again (y/n)? n
Bye. Thanks for playing!
```

while True:

```
    response = raw_input("Play again (y/n)? ")
    if response == 'y' or response == 'n':
        break
    print "Please enter only 'y' or 'n'."
```

Question 8. (15 points) WITHOUT using the string method .lower(), write a program that:

- 1) asks the user to enter a line of text,
- 2) creates an identical line of text, except all upper-case letters are converted to the corresponding lower-case letter, and
- 3) displays the line of text converted to lower-case.

(Recall that the ord function returns the ASCII value of a character, and the chr function returns the character given an ASCII value argument.)

```
line = raw_input("Enter line of text: ")
for character in line:
    if character >= 'A' and character <= 'Z':
        print chr(ord(character) + ord('a') - ord('A')),
    else:
        print character,
```