COSC 1306  FIRST QUIZ  SEPTEMBER 26, 2016

Closed book. You will be allowed one page of notes plus the official Python crib sheet

1. Which of the following statements are true or false? (10×3 points)

   T ____  F ____  Linear searches only work when the data are sorted.

   T ____  F ____  Having a large disk drive allows us to store more data on our computer.

   T ____  F ____  Algorithms always provides the correct answer but can take forever.

   T ____  F ____  The main memory is the part of the computer that executes your programs.

   T ____  F ____  A three-bit binary number will never be bigger than three.

   T ____  F ____  Most heuristics are much faster than the algorithms they try to replace.

   T ____  F ____  Programs without comments are harder to read by humans.

   T ____  F ____  In Python, Total and total represent the same variable.

   T ____  F ____  The Python input() function always returns a string.

   T ____  F ____  You cannot run Python programs on a computer that does not have the Python interpreter installed.

2. What are the final values of the variables a, b, c, and d after the following Python code is executed? (4×5 points)

   a = 6//7  b = "3" + "4"  c = 1/2 + 2  d = 2**1**2

   a = __0____  b = ___34___  c = __2.5___  d = ___2___

3. Convert the following five binary numbers to know something about yourself  (5 points)

   011 001 011 011 111 means you are ________________________________ 31337
4. Which Boolean expression is represented by the following circuit? (10 points)

\[
\text{\begin{tikzpicture}
\node (A1) at (0,0) {$p$};
\node (A2) at (0,-1) {$q$};
\node (A3) at (-1,-1) {$r$};
\end{tikzpicture}}
\]

\[ p \lor (q \land r) \]

5. Consider the following table:

<table>
<thead>
<tr>
<th>Alice</th>
<th>Barbara</th>
<th>Carlos</th>
<th>Dean</th>
<th>Kate</th>
<th>Laura</th>
<th>Sayed</th>
</tr>
</thead>
</table>

and assume you perform a binary search to find out whether the string "William" is in the table. How should you proceed? (3×5 points)

I will first compare "William" with Dean \______________ then with Laura \______________ and finally with Sayed \______________

6. Write a Python program telling a young kid how many candy bars he can purchase with the money he has, as in: (4×5 points) Use variables names that describe in some way the quantities they represent.

```python
money = float(input("How much money do you have? "))
price = float(input("How much does a candy bar cost? "))
howmany = money//price
print("You can buy ", howmany, " candy bars")
```
1. Which of the following statements are true or false? (10×3 points)

   T  X  F  ____  Having a *large disk drive* allows us to *store* more data on our computer.
   T  ____  F  X  ____  Algorithms always provide the correct answer but can take *forever*.
   T  ____  F  X  ____  Linear searches only work when the data are sorted.
   T  X  F  ____  The main memory is the part of the computer that executes your programs.
   T  X  F  ____  A three-bit binary number will never represent a number bigger than seven.
   T  X  F  ____  Most heuristics are much faster than the algorithms they try to replace.
   T  X  F  ____  You cannot run Python programs on a computer that does not have the Python interpreter installed.
   T  X  F  ____  Programs without comments are harder to understand by humans.
   T  ____  F  X  ____  In Python, **Total** and **total** are two ways to write the same variable name.
   T  X  F  ____  The Python input() function always returns a string.

2. What are the values assigned by Python to the variables *a*, *b*, *c*, and *d*? (4×5 points)

   \[
   \begin{align*}
   a &= "31" + "7" \\
   b &= 9/4 \\
   c &= 2 - 1/2 \\
   d &= 3**1**^2
   \end{align*}
   \]

   \[
   \begin{align*}
   a &= \_317\_ \\
   b &= \_2\_ \\
   c &= \_1.5\_ \\
   d &= \_3\_
   \end{align*}
   \]

3. Convert the following five binary numbers to know something about yourself (5 points)

   **011 001 011 011 111** means you are _______________ **31337**
4. Which Boolean expression is represented by the following circuit? (10 points)

\[ b \lor (c \land d) \]

5. Consider the following table:

- Alice
- Barbara
- Carlos
- George
- Kate
- Laura
- Susan

and assume you perform a binary search to find out whether the string "Anna" is in the table. How should you proceed? (3×5 points)

I will first compare "Anna" with George then with Barbara and finally with Alice.

6. Write a Python program telling a young kid how many candy bars he can purchase with the money he has, as in: (4×5 points)

```python
price = float(input("How much does a candy bar cost? "))
money = float(input("How much money do you have on you? "))
howmany = money//price
print("You can buy up to", howmany, "candy bars")

ALSO: print("You can buy up to " + str(howmany) + " candy bars")
```