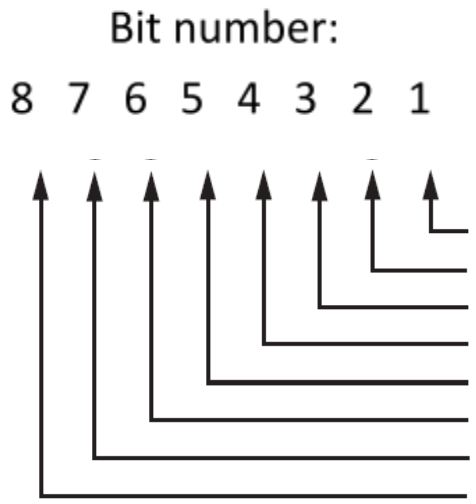
COSC 1336 Exam 1 Review Problems

Variables, constants, input/output and processing

1. Fill in the chart with the appropriate value if j is the bit position and the value at each position is 2^{j-1}



2. Convert the following binary values to decimal

i. 00000100

ii. 01001010

iii. 01100110

3. Convert the following decimal values to one-byte binary numbers. Specify a value for all eight bits in the byte.

i. 5

ii. 105

iii. 127

4. Convert the following binary bytes to their corresponding ASCII characters

i. 01110010

ii. 00101101

iii. 00110000

5. Convert the following ASCII characters to their corresponding binary representations.

i. C

ii. 4

iii. @

6. Determine whether each of the following Python identifiers is valid or invalid. If it is valid, say whether it is appropriate for a variable or a constant. If it is invalid say why it is invalid, and whether it breaks an interpreter rule or a convention.

a. `item#1`

b. `data`

c. `1variable`

d. `sq_height`

e. `PAY_RATE`

h. `num5`

i. `Circle_Radius`

j. `sq ft`

k. `bin-2`

l. `DISTANCETOMOON`

7. Compute the value of each of the following expressions. Give the type of the output.

a. `10 + 3`

b. `-9.4 - 6`

c. `10.0/3.0`

d. `10/3.0`

e. `10.0//3.0`

f. `10//3`

g. `10/3`

h. `10 % 3`

i. `2 ** 3.0`

j. `4 / 8`

k `8 / 1.5`

l. `8 // 1.5`

8. For each of the following statements, assume that the statement directly follows these lines of code:

```
a =
5 b
= 2
```

What output does each statement produce?

a. `print("a = ", a, ", b = ", b, sep="")`

b. `print("sum:",a+b)`

c. `print("sum:","a+b")`

d. `print(a // b, "feet")`

9. Write the Python code corresponding to the following pseudocode algorithm for calculating the cost of carpet for a room.

```
read in room length
read in room width
read in price per square foot

calculate room area by multiplying room width by room length
calculate total cost by multiplying room area by price per square foot

display total cost
```

Selection

10. Given the following variables, for each problem, determine what will be printed on the screen when the code is executed. If there is an error, say what the error is.

```
num1 = 4
num2 = 13.0
tf = False
```

a.
```
if num2 > 5:
  print("Big")
else:
  print("Small")
```

b.
```
if num1 == 5:
  print("Message 1")
else:
  print("Message 2")
```

c.
```
if num1 = 5:
   print("Message 1")
else:
   print("Message 2")
```

d.
```
if num2 > num1:
  print("Tom")
if not tf:
  print("Harry")
```

e.
```
if tf == num2 > num1:
    print("this tf:", tf)
else:
    print("that tf:", tf)
```

f.
```
tf = True
if tf == num2 > num1:
    print("this tf:",tf)
else:
    print("that tf:",tf)
```

g.
```
tf = "True"
if tf == num2 > num1:
  print("this tf:",tf)
else:
  print("that tf:",tf)
```

11. Given the following variables, determine whether each expression is True or False.

```
a = 1
b = 5
c = -1
my_bool = False;
```

a. `a == -c and a < b`

b. `not (not my_bool)`

c. `b < c and 2 < b`

d. `(not my_bool and (c < b or a == b)) or not my_bool`

e. `my_bool and ((a < b and c < b) and c < 0)`

Loops

12. Write a loop of the specified type that sums up the even integers between 1 and 21.

a. a `while` loop

b. a `for` loop

13. What will the following lines of code print out?

a.
```
num = 5
while num < 5:
  print(num, end=" ")
  num = num - 1
```

b.
```
num = 5
while True:
  print(num, end=" ")
  num = num - 1
  if num < 5:
     num +=1
```

14. Write a set of nested loops that display 10 rows of # characters. There should be 15# characters in each row.

15. Write an input validation loop that prompts the user to enter a number in the range of 1 through 100 and validates the input.