COMP 122/L
Summer 2023

Binary Arithmetic

1.) Consider addition over a single bit. For each question, specify both the result of the addition, as well as the output carry bit value.

1.a.) 1 + 1, input carry bit unset.

1.b.) 1 + 1, input carry bit set.

1.c.) 1 + 0, input carry bit set.

1.d.) 1 + 0, input carry bit unset.

2.) For each question, your output should be a 4-bit binary number. Additionally, say what the values of the output carry bit and output overflow bit are.

2.a)

```
  1001
+ 1001
```

2.b)

```
  0111
+ 0001
```

For the questions involving subtraction, you should rewrite these as additions with negated second operations, and an input carry bit set. For example:

```
  1111
- 1101
```

...should be converted to:

```
     1
  1111
+ 0010
```

...resulting in:

```
  1111
  1111
+ 0010
  0010   Carry set, overflow not set
```

2.c)

```
     1001
   - 1001
```

2.b)

```
     1111
   - 0001
```