

1 September 2022

1. **Warm up:** Answer the following True / False questions.

- (a) One byte is four bits.
- (b) One integer `int` is four bytes.
- (c) The sign of an integer `int` is given by the bit - in front of the `int`.
- (d) Since one byte can have 256 different values, 10 bytes can have 2560 different values.

2. This problem refers to the following C++ code, which compiled, is a program called `power`.

```
#include <iostream>
using namespace std;
int main() {
    float base;
    int exp;
    cin >> base;
    cin >> exp;
    float result = base;
    for (int i = 1; i < exp; i++) {
        result = result*base;
    }
    cout << result << "\n";
    return 0;
}
```

(a) Complete the table below for a given input to the program `power`.

input	2 4	4 4 4	-2 4	2 -4	-2 -4	2.9 4	2.9 4.9	2E10 4
output								

(b) Recall that `float` has a limited range. What is the largest number `X` for which the input `X 2` will output the square of `X`?

3. Write a program that corresponds to the following flowchart.

