Goals

- To enjoy a simple programming assignment done in a variety of early procedural programming languages.
- To reflect on this experience through a consulting log.
- To facilitate discussions about programming and languages.

Instructions

Develop a set of functions that will allow you to **encrypt** a string using a Caesar cipher.
Develop a set of functions that will allow you to **decrypt** a string using a Caesar cipher.
Develop a set of functions that will help you to **solve** (break) a Caesar cipher.

Implement all of the above functions for all of the following languages:

- **Encrypt, Decrypt, Solve** in Fortran [15 points]
- **Encrypt, Decrypt, Solve** in COBOL [15 points]
- **Encrypt, Decrypt, Solve** in BASIC (if you like, you may, with my approval, substitute another early, procedural programming language for BASIC. Just ask me first.) [15 points]
- **Encrypt, Decrypt, Solve** in Pascal [15 points]
- **Encrypt, Decrypt, Solve** in Scala (in a procedural manner) [15 points]

Log and Commentary [75 points]

Make a prediction about how long you think it will take you to program this assignment. Write it down. Then keep a log of your work, just like you would as a consultant. The format should be similar to the following:

<table>
<thead>
<tr>
<th>Date</th>
<th>Hours Spent</th>
<th>Tasks / Accomplishments / Issues / Thoughts</th>
</tr>
</thead>
</table>

Be thorough and descriptive in your log. Sum the hours spent when you are finished. Note your original prediction on the log. Write a paragraph or two to explain the discrepancy. (It will likely be huge.)

Finally, and **most importantly**, keep a running commentary (“Dear Diary…” ) about your thoughts and experience with each language, including how each language is similar or dissimilar to the others. Tell me in **great detail** about your thoughts on each language regarding its **readability** and **writability**, and what you loved and hated about each. Include a list of your Google searches, as I find that illuminating. Rank the languages when you’re done.

This is, **by far**, my favorite part of this assignment. I look forward to reading your thoughts, searches, and comments, so be thoughtful, thorough, amusing; impress me.

Submitting

Make a PDF of your consulting log, commentary, source code, and output of (very) thorough test runs. Be sure that it’s all **one** PDF document. E-mail it to me any time **before** the class in which it is due. Remember to include your name in the write-up and in your comments.

Examples **on the next page**
The usage for **encrypt** and **decrypt** should be as follows:

```pascal
encrypt(str, shiftAmount)
decrypt(str, shiftAmount)
```

**Pascal code fragment:**

```pascal
var
  x : string;
  y : string;
  x = encrypt("This is a test string from Alan", 8);
  writeln(x);
  y = decrypt(x, 8);
  writeln(y);
```

**Example output:**

```
BPQA QA I BMAB ABZQVO NZWU ITIV
THIS IS A TEST STRING FROM ALAN
```

Things might be easier if you use only capital letters, so consider writing a “toUpperCase” function so that you can deal with mixed-case input. It’s okay if your output is all caps.

The usage for **solve** should be as follows:

```pascal
solve(str, maxShiftValue);
```

**In Pascal, again:**

```pascal
solve("HAL", 26);
```

**Example output:**

```
Caesar 26: HAL
Caesar 25: GZK
Caesar 24: FYJ
Caesar 23: EXI
Caesar 22: DWH
Caesar 21: CVG
Caesar 20: BUF
Caesar 19: ATE
Caesar 18: ZSD
Caesar 17: YRC
Caesar 16: XQB
Caesar 15: WPA
Caesar 14: VOZ
Caesar 13: UNY
Caesar 12: TMX
Caesar 11: SLW
Caesar 10: RKV
Caesar 9: QJU
Caesar 8: PIT
Caesar 7: OHS
Caesar 6: NGR
Caesar 5: MFQ
Caesar 4: LEP
Caesar 3: KDO
Caesar 2: JCN
Caesar 1: IBM
Caesar 0: HAL
```