BE5B33PRG: Programming Essentials
Homework: Spam filter

Petr Pošík

SPAM?

Hormel Foods Corporation, since 1937
see http://www.spam.com

The meaning of SPAM acronym:

- *Shoulder of Pork And Ham* or *Spiced Ham*
- "Specially Processed American Meats" (USA offered SPAM to England during WW2)
- "Something Posing As Meat"
- "Specially Processed Artificial Meat"
- "Stuff, Pork and Ham"
- "Special Product of Austin Minnesota"

OK, seriously, what is SPAM?

A sketch from **Monty Python's Flying Circus**:

- see it e.g. on youtube.com
- a married couple wants to have a breakfast in a snack bar
- the snack-bar staff reads the menu:
    - egg and bacon
    - egg, sausage and bacon
    - egg and spam
    - egg, bacon and spam
    - egg, bacon, sausage and spam
    - spam, bacon, sausage and spam
    - spam, egg, spam, spam, bacon and spam
    - spam, spam, spam, egg and spam
    - spam, spam, spam, spam, spam, spam, baked beans, spam, spam, spam and spam
    - lobster thermidor aux crevettes, with a mornay sauce garnished with truffle pate, brandy and a fried egg on top and spam
- the wife does not want any meal containing SPAM
- the staff and her husband keep forcing her to get SPAM
- "I DON'T LIKE SPAM!!!"

In 1970s:

- in USENET groups, messages that nobody was interersted in started to show up
- SPAM - uninteresting, unwanted, obtrusive, repeating messages
- HAM - normal correct messages on topic

SPAM or HAM? (1)

```
As seen on NBC, CBS, CNN, and even Oprah! The health discovery
that actually reverses aging while burning fat, without dieting
or exercise! This proven discovery has even been reported on by
the New England Journal of Medicine. Forget aging and dieting
forever! And it's Guaranteed!

Click here: http://web.kuhleersparnis.ch/hgh/index.html

Would you like to lose weight while you sleep!?
No dieting!
No hunger pains!
No Cravings!
No strenuous exercise!
Change your life forever!
100% GUARANTEED!

1.Body Fat Loss          82% improvement.
2.Wrinkle Reduction      61% improvement.
3.Energy Level           84% improvement.
4.Muscle Strength        88% improvement.
5.Sexual Potency         75% improvement.
6.Emotional Stability    67% improvement.
7.Memory                 62% improvement.
```

SPAM or HAM? (2)

```
Filled with useful examples and the depth, clarity, and attention to
detail that made the first edition so popular with web developers,
the just-released "JavaServer Pages, 2nd Edition" (Bergsten, \$44.95)
is completely revised and updated to cover the substantial changes
in the 1.2 version of the JSP specifications, and includes coverage of
the new JSTL Tag libraries--an eagerly anticipated standard set of
JSP elements for the tasks needed in most JSP applications, as well as
thorough coverage of Custom Tag Libraries.

What people said about the first edition:
"an excellent printed resource on JSPs...I have been extremely
impressed by its depth, clarity, and attention to detail. "
                              --Reuven M. Lerner, Linux Journal

"This is a great book: it was written by a key contributor not only
to the JSP specification, but also to the JSP and  Servlet reference
implementations. Filled with useful examples, it stands as an important
text in the adoption of JSP in the market."
        --Eduardo Pelegri-Llopart, lead JSP Specification Engineer.

To order your copy or for more information, see:
http://www.oreilly.com/catalog/jserverpages2/?CMP=7337
or call 1-800-998-9938
or email orders@oreilly.com
```

Third time lucky, what is SPAM?

What is spam? How would you define it?

- Unsolicited email?
- Unsolicited commercial email?
- Bulk unsolicited commercial email?
- **Spam is an** *unsolicited* **e-mail sent** *indiscriminately* **to multiple mailing lists, individuals, or newsgroups, often of a** *commercial nature*.
    - vague definition, may not cover all cases, may cover cases which are not spam

Further questions about spam:

1. Would all people describe as spam the same set of messages?
2. If the same man got the same set of messages now and five years in the future, would he describe as spam the same emails?

Spam filter

What is a *Spam filter*?

- A machine that can label each message either as SPAM or as HAM.

What are its inputs and outputs?

- Input: all information about the email that we can get (message body, its formatting, headers, attachments, . . .). Very often unstructured text.
- Output: label SPAM or HAM

Further questions about spam filter:

1. Can a single spam filter satisfy all potential users?
2. What feature must the spam filter have so that
    - it can preserve its performance in time?
    - it can be equally usefull for different people?
3. Can a spam filter make an error?
    - What types of errors?
    - Are all the errors equally serious for us?
    - How do you decide whether one filter is better than another?

Features of SPAM

What are the features of spam? What characteristics can the filter use to decide whether a mail is spam or not?
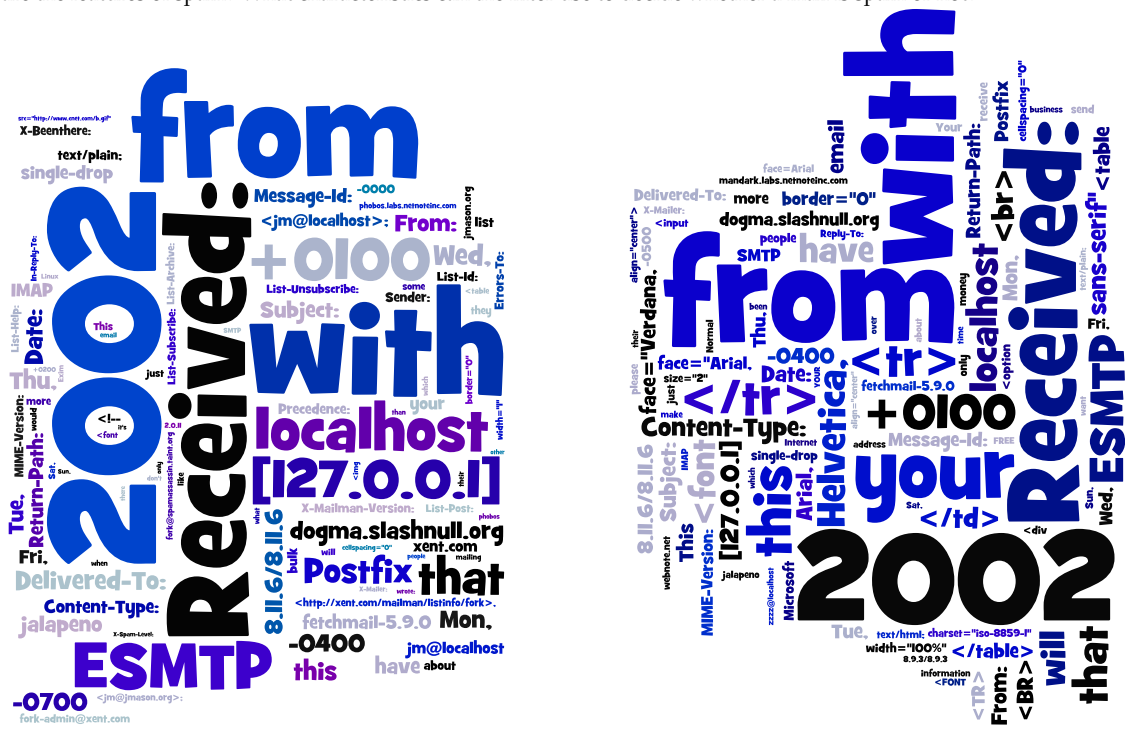
Goals and organization

The work plan

Plan:

- You have more than 5 weeks for this task.
- Spend 2-3 weeks working on the foundations allowing us to
    - easily test filters on real data,
    - compare them and
    - clarify how the spam filter should be implemented.
- Spend the rest of time working on the actual filter:
    - we do not require any super-anti-contra-multi-extra-unique filter; you do not have the needed background for them
    - at least, try out some relatively simple method that - in your opinion - should work for spam filtering

What shall be handed in?

- Implementation of the evaluation function for spam filters.
- Implememtation of the spam filter.