Name: [redacted] M.Number: [redacted] KDDM1 (707.003), 22.10.2015, Group(A)

2. Symmetric matrices

a) Convince yourself that matrices $\mathbf{A}\mathbf{A}^T$ and $\mathbf{A}^T\mathbf{A}$ are symmetric:

$$\mathbf{A} = \begin{pmatrix} 3 & -2 \\ 4 & 5 \end{pmatrix}.$$

b) Prove that for any matrix $\mathbf{A} \in \mathbb{R}^{n \times n}$ matrices $\mathbf{A}\mathbf{A}^T$ and $\mathbf{A}^T\mathbf{A}$ are symmetric.

SVD: singular value decomposition

M: connects items and users (utility matrix) $v: U \times I \to R$

U: connects ~~items~~ items and concepts (eigenvectors of $M \cdot M^T$)

V: connects users and concepts (eigenvectors of $M^T M$)

Σ: indicates how strong the concepts are (root of eigenvalues of MM^T or $M^T M$)

2.) b)

$$A \cdot A^T = \begin{pmatrix} 3 & -2 \\ 4 & 5 \end{pmatrix} \begin{pmatrix} 3 & 4 \\ -2 & 5 \end{pmatrix}$$

$$A^T \cdot A = \begin{pmatrix} 3 & 4 \\ -2 & 5 \end{pmatrix} \begin{pmatrix} 3 & -2 \\ 4 & 5 \end{pmatrix}$$

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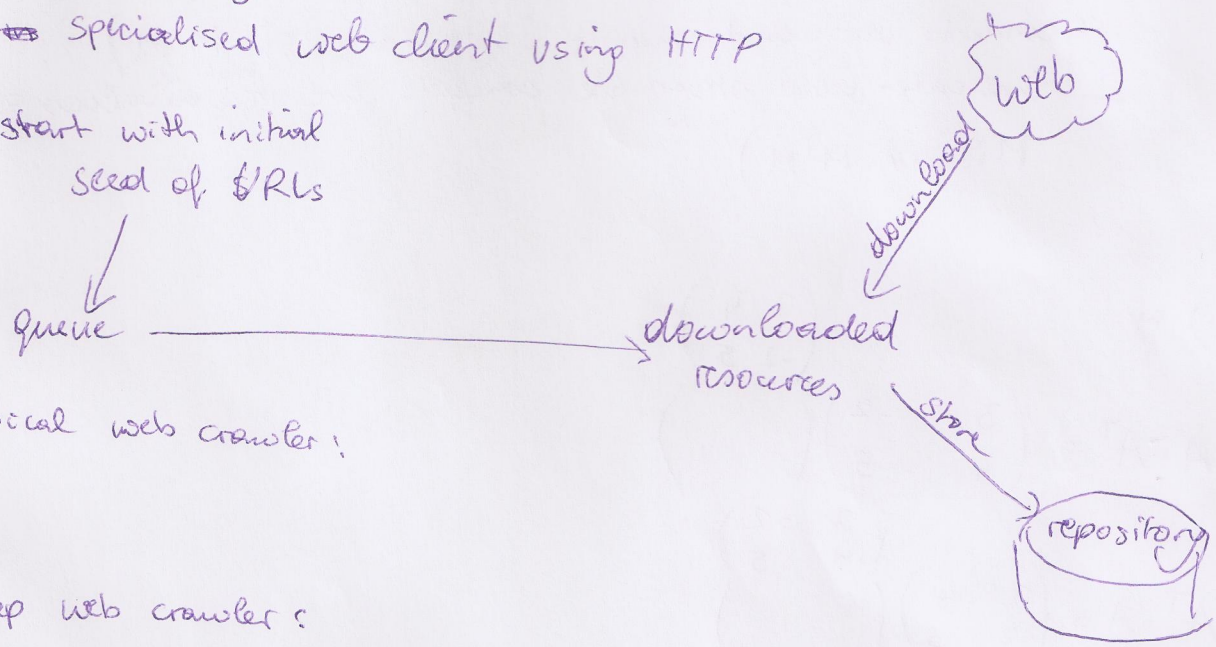
1. Web-Crawling:

   a) List a number of use-cases where Web Crawling might be needed or useful
   b) Describe the basic building blocks of a Web Crawler
   c) List and describe specialised Web Crawlers
   d) What are the main challenges when doing Web Crawling?
   e) What is the Deep Web?

a) • general search engines (~~Bing~~ Google)
   • vertical search engines (yelp)
   • image processing

b) ~~Web~~ Specialised web client using HTTP

start with initial seed of URLs



c) topical web crawler:

deep web crawler:

focused web crawler: thematic, type

d) ~~many~~