Exercise 1

Generate (pseudo-)code for the following operator tree using the push model.

Use the following schema.

- A(a, d)
- B(a, b, c)
- C(a, c)

```
PRINT(*)

×_{B.c=C.c}

×_{A.a=B.a}

\sigma_{d=42}

A

×_{C=c*c}

B

C
```

Exercise 2

Parallelize the given query plan by introducing the exchange operators $\text{XchgHashSplit}(n:m)$ and $\text{Xchg}(n:m)$ for two threads as necessary. $\Gamma_{r1:a}$ stands is an aggregation that groups by the attribute $r1$ and generates a new aggregate attribute $a$.

```
\text{×}_{r1=s1}

\text{×}_{a=t1}

\Gamma_{r1:a}

\sigma_{t1=...}

\text{×}_{r1=s1}

R

S

T
```