

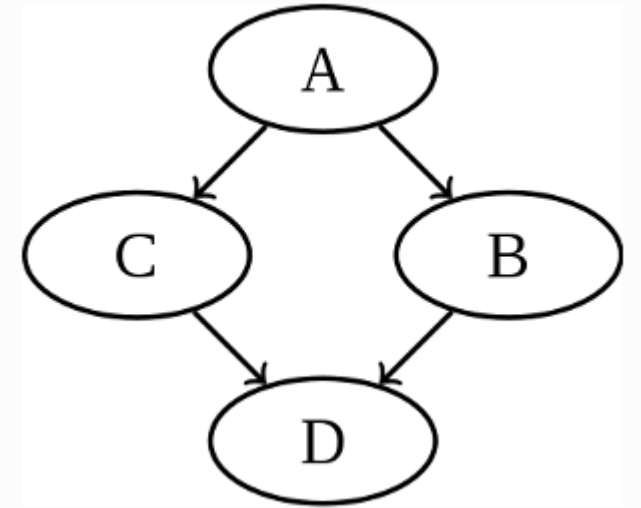


# HTCondor workflows with DAGMan

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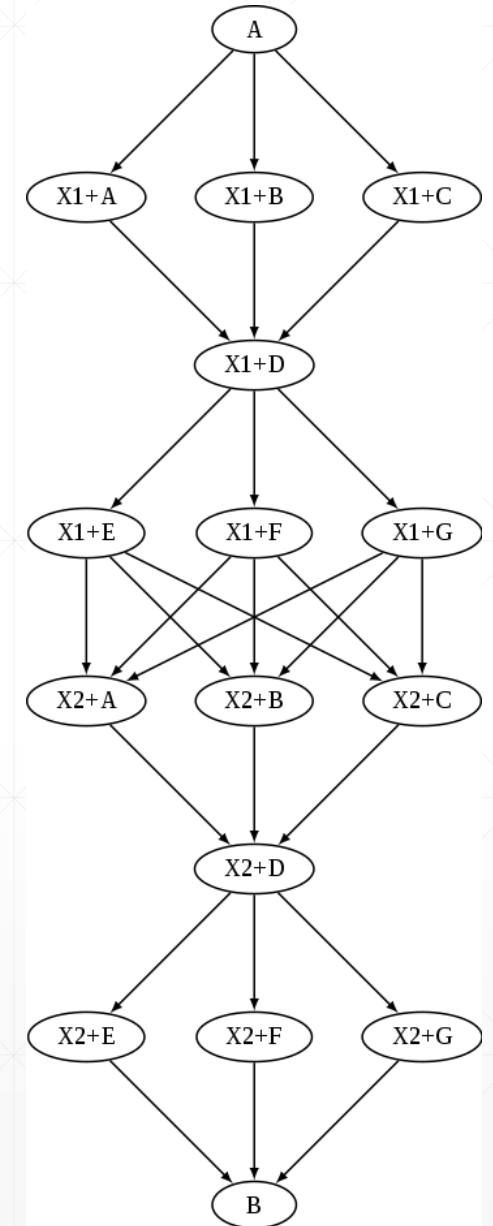
# HTCondor Workflows

- One HTCondor submission is self-contained
  - Dependencies between multiple steps manually handled
- DAGMan is a HTCondor tool to automatically submit jobs in given order, respecting any dependencies between those
  - Additionally, more control on failure classification and resubmission
  - Staggered submission (submit jobs only for idle queue < X) and throttling options



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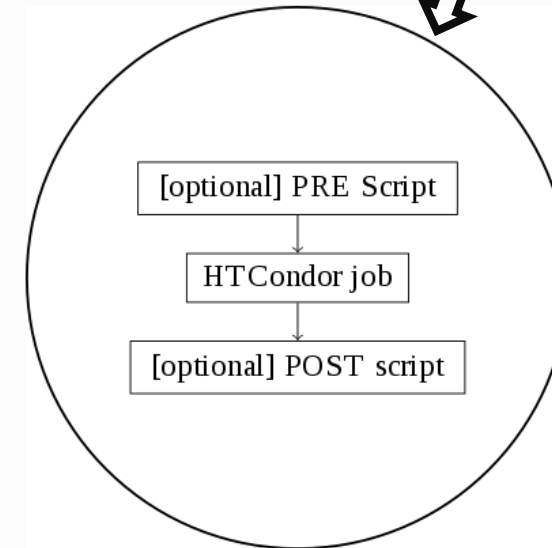
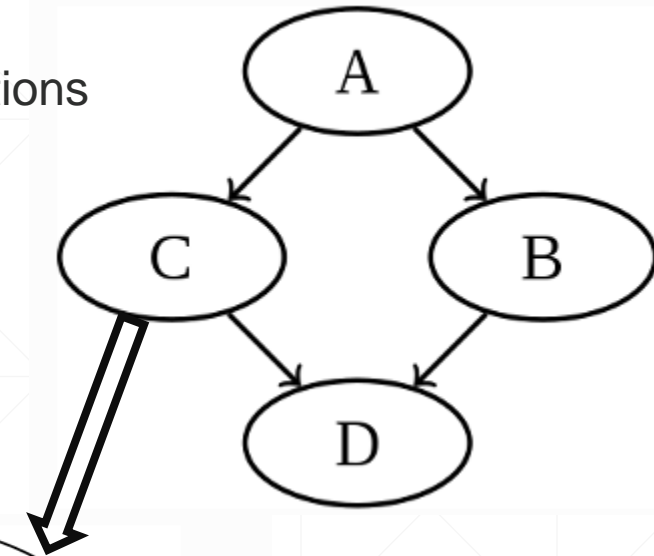


# DAG setup

- One DAGjob/node
  1. Pre-script: check input files, generate submit-file, skip job under certain conditions
  2. HTC job: `.sub` file
  3. Post-script: check output-files, throw errors based on output and trigger resubmission
- To “convert” HTCondor jobs to DAGman workflow:
  - Create `.dag` file specifying dependencies

```
JOB A A.condor.sub
JOB B B.condor.sub
JOB C C.condor.sub
JOB D D.condor.sub
PARENT A CHILD B C
PARENT B C CHILD D
SCRIPT PRE A input_A.sh
SCRIPT POST A input_A.sh
SCRIPT PRE B input_B.sh
PRE_SKIP B 123
```

- `condor_submit_dag file.dag`



# SixDag

- As example: [SixDesk](#)
  1. MAD-X jobs to create fort input files for X seeds
    - a) Process separately additional MAD-X output (Twiss, PTC\_NORMAL)
  2. [Sixtrack](#) jobs using X fort input files and for Y particles
  3. Run [SixDeskDB](#) to get DA
    - could be one DAGMan workflow
- Setup with Pre-/Post-scripts still allows step by step execution and checks
- Small incomplete example [here](#)
- Issues:
  - Handling of input-/output-files tedious
  - Technology lock-in (requires HTC on machine, BOINC, LSF, SLURM not nicely integrated, see instead [Pegasus](#))
- Further reading: [ReadTheDocs](#), [HTC Week 2016](#), [2018](#)