

# Build HM Deck

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## Data

First we need to get the SPE9 deck from the OPM repository. There is some confusion over whether the cartesian deck will run, or not. We will try both the cartesian and corner point decks. These decks will be put into a “test” project.

```
# projdir <- "~/gitrepos/spe9hm"
# setwd(projdir)
getwd()

## [1] "/home/gerw/gitrepos/spe9hm"

library(runOPM)
makeproj(basedir="test")

## [1] FALSE

baseurl <- "https://raw.githubusercontent.com/OPM/opm-data/master/spe9/"
infiles <- c("SPE9.DATA", "PERMVALUES.DATA", "TOPSVALUES.DATA", "SPE9_CP.DATA",
             "SPE9.GRDECL")
for(fn in infiles){
  urlin <- paste0(baseurl,fn)
  fnout <- paste0("test/DECKS/",fn)
  if(!file.exists(fnout)){
    download.file(url = urlin, destfile = fnout, method='curl')
  }
}
decks <- findDecks("test")
decks

## [1] "/home/gerw/gitrepos/spe9hm/test/DECKS/PERMVALUES.DATA"
## [2] "/home/gerw/gitrepos/spe9hm/test/DECKS/SPE9_CP.DATA"
## [3] "/home/gerw/gitrepos/spe9hm/test/DECKS/SPE9.DATA"
## [4] "/home/gerw/gitrepos/spe9hm/test/DECKS/TOPSVALUES.DATA"
```

Some of these files look more like include files, and should be in lower level directories

```
for(deck in decks){
  deckname <- basename(deck)
  dk <- readLines(deck, warn = FALSE)
  lnum <- grep(pattern = "^INCLUDE$", x = dk, perl = TRUE)
  if(length(lnum) > 0){
    for(i in 1:length(lnum)){
      print(paste0("deck:", deckname, ", line: ", lnum[i]+1, ", text: ",
                  dk[lnum[i]+1]))
    }
  }
}
```

```
## [1] "deck:SPE9_CP.DATA, line: 86, text: \t'SPE9.GRDECL' /"
```

```
## [1] "deck:SPE9_CP.DATA, line: 109, text: \tPERMVALUES.DATA /"
## [1] "deck:SPE9.DATA, line: 109, text: \tTOPSVALUES.DATA /"
## [1] "deck:SPE9.DATA, line: 132, text: \tPERMVALUES.DATA /"
```

It looks like three include files in two main decks. We will move the include files down a directory, change the extents so they won't be confused with decks anymore, and change the include file names in the main decks. We will put the include in a GRID subdirectory.

```
dir.create(file.path("test", "DECKS", "GRID"))
```

Run the SPE9 decks to see which ones work with flow.

```
#for(deck in decks){
#  runflow(deck, basedir - "test")
#}
```

Next we need to pull out the porosity and permeability, so we can make some rock regions. The intent is to do some kmeans clustering to define rock groups, and then create regions in the deck suitable for history matching.