Untitled

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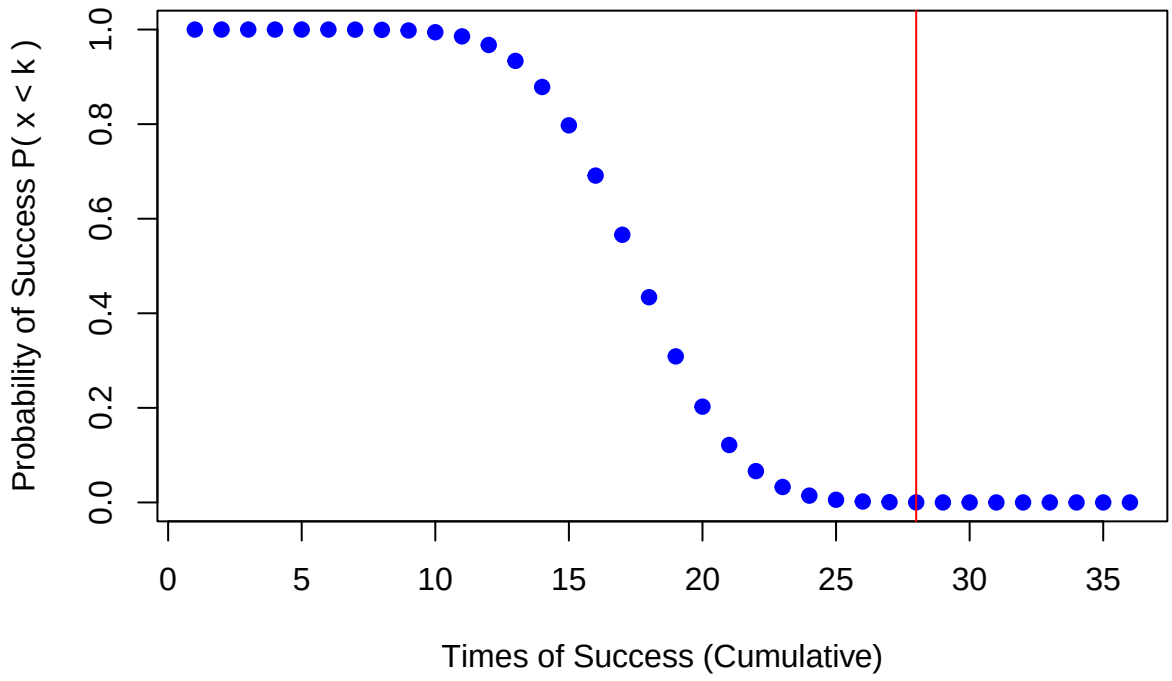
Binomial Distribution If prob = 0.5 (pureguess)

```
success.times <- 1:36

probability.acc <- pbinom(q = success.times, size = 36, prob = 0.5)

plot(success.times, 1 - probability.acc,
  pch = 19, col = "blue",
  xlab = "Times of Success (Cumulative)",
  ylab = "Probability of Success P( x < k )"
)
abline(v = 28, col = "red")
```

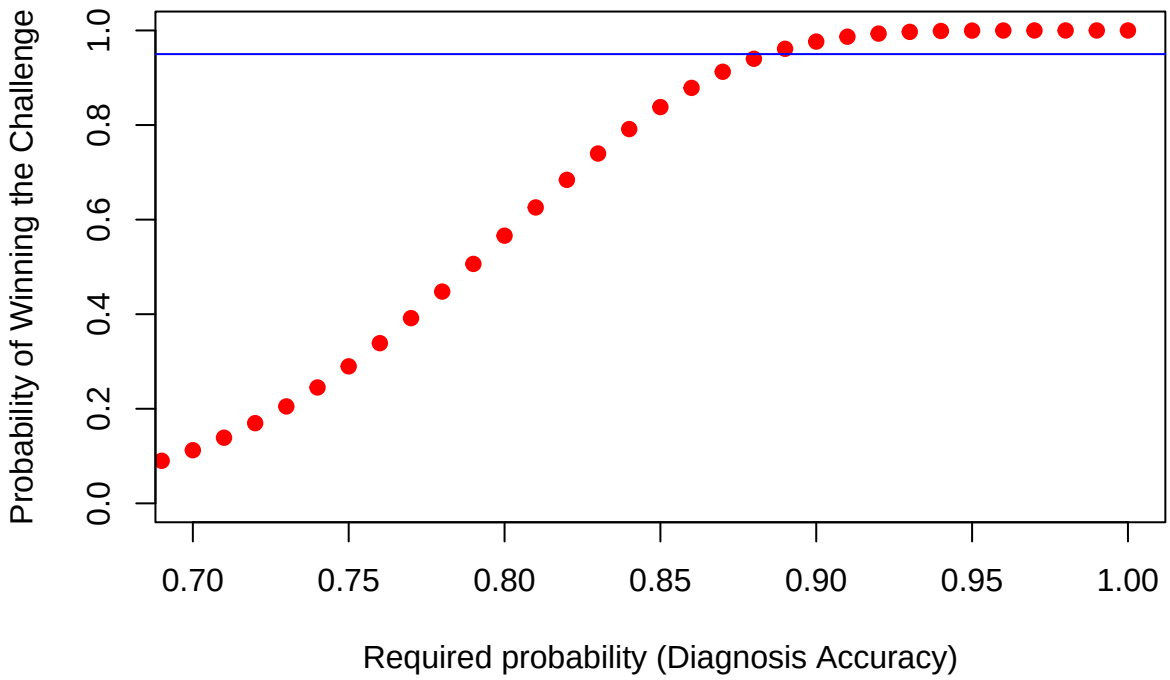



```
pureguess.prob <- 1 - pbinom(q = 28, size = 36, prob = 0.5)
```

If a 95% probability of winning the competition is guaranteed, then the required probability of correct

diagnosis is prob.real

```
prob.real <- seq(0, 1, by = 0.01)
probability.succ <- 1 - pbinom(q = 28, size = 36, prob = prob.real)
plot(prob.real, probability.succ,
  pch = 19,
  col = "red",
  xlab = "Required probability (Diagnosis Accuracy)",
  ylab = "Probability of Winning the Challenge",
  xlim = c(0.7, 1)
)
abline(h = 0.95, col = "blue")
```




```
sessionInfo()
```

```
## R version 4.1.3 (2022-03-10)
## Platform: x86_64-w64-mingw32/x64 (64-bit)
## Running under: Windows 10 x64 (build 22000)
##
## Matrix products: default
##
## locale:
## [1] LC_COLLATE=Chinese (Simplified)_China.936
## [2] LC_CTYPE=Chinese (Simplified)_China.936
## [3] LC_MONETARY=Chinese (Simplified)_China.936
## [4] LC_NUMERIC=C
## [5] LC_TIME=Chinese (Simplified)_China.936
```

```
##
## attached base packages:
## [1] stats     graphics  grDevices utils     datasets  methods   base
##
## loaded via a namespace (and not attached):
##  [1] compiler_4.1.3  magrittr_2.0.3  fastmap_1.1.0   cli_3.2.0
##  [5] tools_4.1.3     htmltools_0.5.2 rstudioapi_0.13 yaml_2.3.5
##  [9] stringi_1.7.6   rmarkdown_2.13  highr_0.9       knitr_1.38
## [13] stringr_1.4.0   xfun_0.30       digest_0.6.29   rlang_1.0.2
## [17] evaluate_0.15
```