Raport5

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25 05 2020

```
#zad 1 i 2
library(Rlab)
```

```
## Rlab 2.15.1 attached.
```

```
##
## Attaching package: 'Rlab'
```

```
## The following objects are masked from 'package:stats':
##
##     dexp, dgamma, dweibull, pexp, pgamma, pweibull, qexp, qgamma,
##     qweibull, rexp, rgamma, rweibull
```

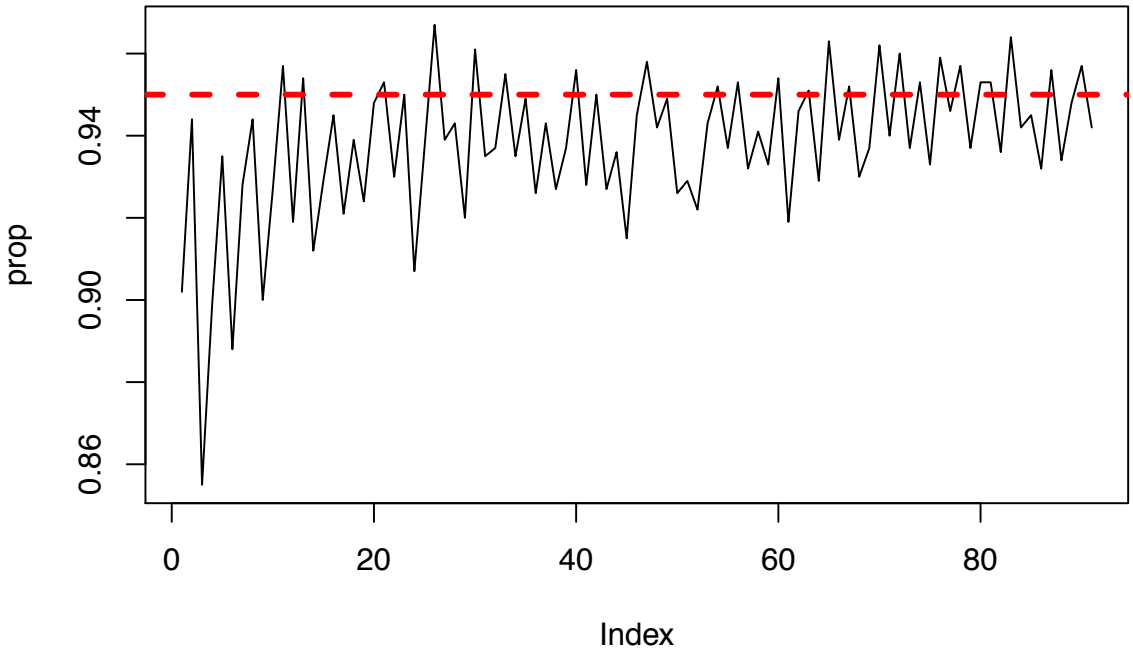
```
## The following object is masked from 'package:datasets':
##
##     precip
```

```
library(DescTools)
library(emplik)

#Wald
prop <- c()
for (j in 10:100){
  k <- 0
  for (i in 1:1000){
    x<-rbern(j,0.5)
    CI <- BinomCI(sum(x[1:j]), j, 0.95, method = "wald")
    if (CI[2]<0.5 && CI[3]>0.5){
      k <- k+1
    }
  }
  prop <- c(prop,k/1000)
}
print(prop)
```

```
##  [1] 0.902 0.944 0.855 0.899 0.935 0.888 0.928 0.944 0.900 0.927 0.957 0.919
## [13] 0.954 0.912 0.929 0.945 0.921 0.939 0.924 0.948 0.953 0.930 0.950 0.907
## [25] 0.937 0.967 0.939 0.943 0.920 0.961 0.935 0.937 0.955 0.935 0.949 0.926
## [37] 0.943 0.927 0.937 0.956 0.928 0.950 0.927 0.936 0.915 0.945 0.958 0.942
## [49] 0.949 0.926 0.929 0.922 0.943 0.952 0.937 0.953 0.932 0.941 0.933 0.954
## [61] 0.919 0.946 0.951 0.929 0.963 0.939 0.952 0.930 0.937 0.962 0.940 0.960
## [73] 0.937 0.953 0.933 0.959 0.946 0.957 0.937 0.953 0.953 0.936 0.964 0.942
## [85] 0.945 0.932 0.956 0.934 0.948 0.957 0.942
```

```r
plot(prop, type="l")
abline(h=0.95, col="red", lwd=3, lty=2)
```



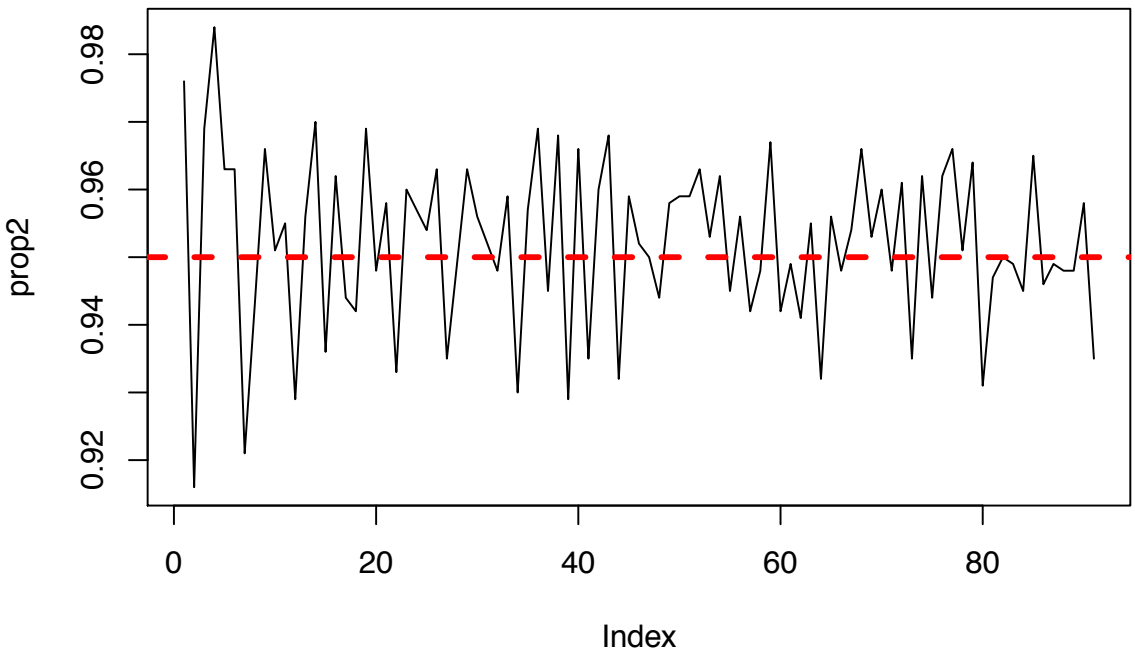

```r
#zad3
 library(proportion)

#Wils

prop2 <- c()
for (j in 10:100){
  k <- 0
  for (i in 1:1000){
    x<-rbern(j,0.5)
    CI <- BinomCI(sum(x[1:j]), j, 0.95, method = "wilson")
    if (CI[2]<0.5 && CI[3]>0.5){
      k <- k+1
    }
  }
  prop2 <- c(prop2, k/1000)
}
print(prop2)
```

```
##  [1] 0.976 0.916 0.969 0.984 0.963 0.963 0.921 0.943 0.966 0.951 0.955 0.929
## [13] 0.956 0.970 0.936 0.962 0.944 0.942 0.969 0.948 0.958 0.933 0.960 0.957
## [25] 0.954 0.963 0.935 0.949 0.963 0.956 0.952 0.948 0.959 0.930 0.957 0.969
## [37] 0.945 0.968 0.929 0.966 0.935 0.960 0.968 0.932 0.959 0.952 0.950 0.944
## [49] 0.958 0.959 0.959 0.963 0.953 0.962 0.945 0.956 0.942 0.948 0.967 0.942
## [61] 0.949 0.941 0.955 0.932 0.956 0.948 0.954 0.966 0.953 0.960 0.948 0.961
## [73] 0.935 0.962 0.944 0.962 0.966 0.951 0.964 0.931 0.947 0.950 0.949 0.945
## [85] 0.965 0.946 0.949 0.948 0.948 0.958 0.935
```

```r
plot(prop2, type="l")
abline(h=0.95, col="red", lwd=3, lty=2)
```

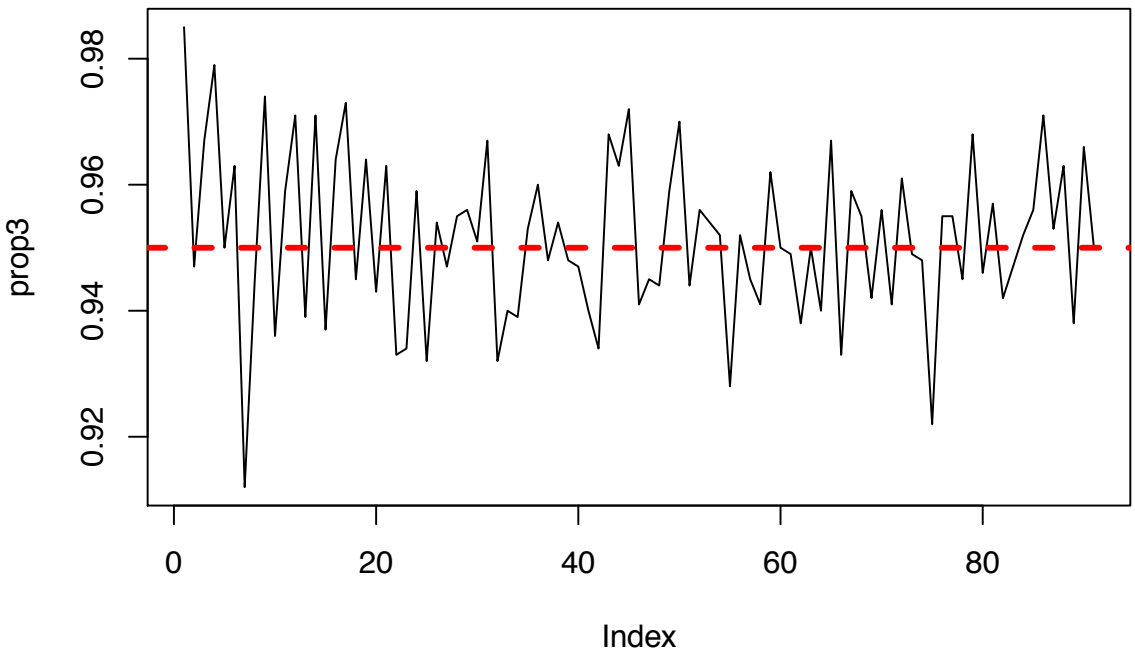



```
#agresti coulla

prop3 <- c()
for (j in 10:100){
  k <- 0
  for (i in 1:1000){
    x<-rbern(j,0.5)
    CI <- BinomCI(sum(x[1:j]), j, 0.95, method = "agresti-coull")
    if (CI[2]<0.5 && CI[3]>0.5){
      k <- k+1
    }
  }
  prop3 <- c(prop3, k/1000)
}
print(prop3)
```

```
##  [1] 0.985 0.947 0.967 0.979 0.950 0.963 0.912 0.945 0.974 0.936 0.959 0.971
## [13] 0.939 0.971 0.937 0.964 0.973 0.945 0.964 0.943 0.963 0.933 0.934 0.959
## [25] 0.932 0.954 0.947 0.955 0.956 0.951 0.967 0.932 0.940 0.939 0.953 0.960
## [37] 0.948 0.954 0.948 0.947 0.940 0.934 0.968 0.963 0.972 0.941 0.945 0.944
## [49] 0.959 0.970 0.944 0.956 0.954 0.952 0.928 0.952 0.945 0.941 0.962 0.950
## [61] 0.949 0.938 0.950 0.940 0.967 0.933 0.959 0.955 0.942 0.956 0.941 0.961
## [73] 0.949 0.948 0.922 0.955 0.955 0.945 0.968 0.946 0.957 0.942 0.947 0.952
## [85] 0.956 0.971 0.953 0.963 0.938 0.966 0.950
```

```
plot(prop3, type="l")
abline(h=0.95 , col="red", lwd=3, lty=2)
```

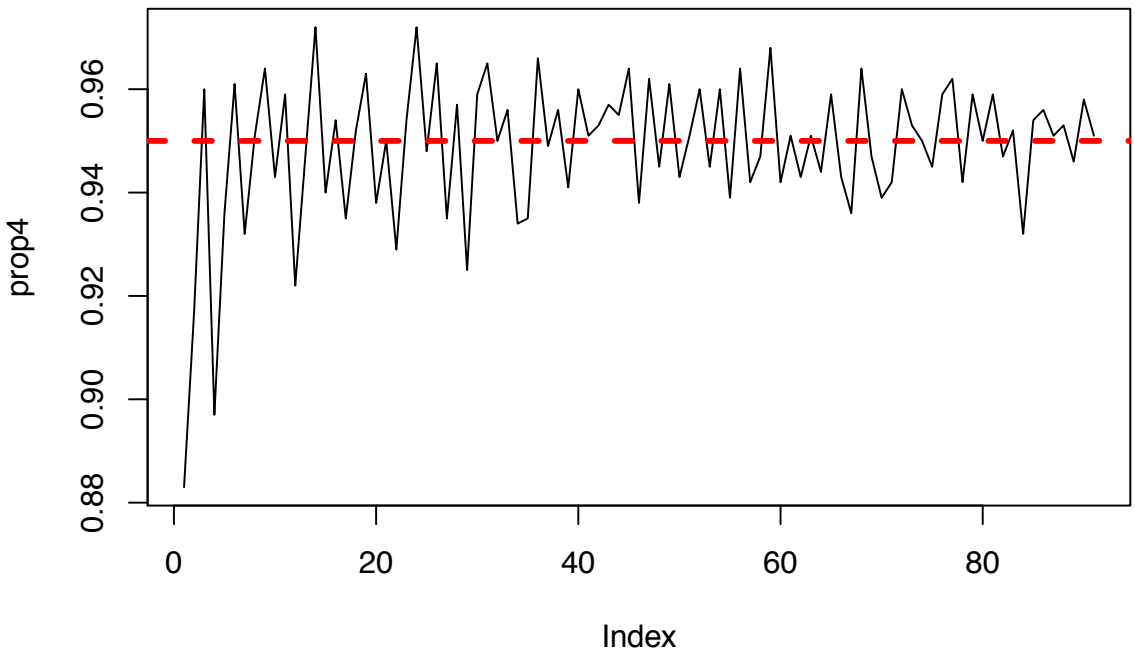



```
#iloraz

prop4 <- c()
for (j in 10:100){
  k <- 0
  for (i in 1:1000){
    x<-rbern(j,0.5)
    CI <- ciLRx(sum(x[1:j]), j, 0.05)
    if (CI[2]<0.5 && CI[3]>0.5){
      k <- k+1
    }
  }
  prop4 <- c(prop4, k/1000)
}
print(prop4)
```

```
##  [1] 0.883 0.917 0.960 0.897 0.936 0.961 0.932 0.951 0.964 0.943 0.959 0.922
## [13] 0.947 0.972 0.940 0.954 0.935 0.952 0.963 0.938 0.950 0.929 0.954 0.972
## [25] 0.948 0.965 0.935 0.957 0.925 0.959 0.965 0.950 0.956 0.934 0.935 0.966
## [37] 0.949 0.956 0.941 0.960 0.951 0.953 0.957 0.955 0.964 0.938 0.962 0.945
## [49] 0.961 0.943 0.951 0.960 0.945 0.960 0.939 0.964 0.942 0.947 0.968 0.942
## [61] 0.951 0.943 0.951 0.944 0.959 0.943 0.936 0.964 0.947 0.939 0.942 0.960
## [73] 0.953 0.950 0.945 0.959 0.962 0.942 0.959 0.950 0.959 0.947 0.952 0.932
## [85] 0.954 0.956 0.951 0.953 0.946 0.958 0.951
```

```
plot(prop4, type="l")
abline(h=0.95 , col="red", lwd=3, lty=2)
```




```
#zad4

var(prop) #Wald
```

```
## [1] 0.0003223433
```

```
var(prop2) #Wilson
```

```
## [1] 0.0001579983
```

```
var(prop3) #AC
```

```
## [1] 0.0001710068
```

```
var(prop4) #iloraz
```

```
## [1] 0.0002027853
```

```
#Po analizie każdej z metod widać że najmniejsze oscylacje posiadają metody Wilson i AC

#Wplyw na to mają również pierwwsze wartośći w metodach Wald i ilorazie, wariancje

#potwierdzaja najelpsze oscylacje metod Wilsona i AC.
```

```
#zad5

p1=0.1
p2=0.2
p3=0.3
p4=0.4
p5=0.5
#Walt
#p1
prop1 <- c()
for (j in 10:100){
  k <- 0
```

```
  for (i in 1:1000){
    x<-rbern(j,p1)
    CI <- BinomCI(sum(x[1:j]), j, 0.95, method = "wald")
    if (CI[2]<p1 && CI[3]>p1){
      k <- k+1
    }
  }
  prop1 <- c(prop1,k/1000)

}
w1<-c()
for (i in 1:length(prop1)){
  if (prop1[i]>= 0.93){
    w1[i]<-prop1[i]
  }
}
w1
```

```
##  [1]    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA    NA
## [13]    NA    NA    NA    NA 0.933 0.945 0.951 0.950    NA    NA    NA    NA
## [25]    NA    NA    NA    NA    NA    NA    NA    NA    NA 0.937    NA 0.934
## [37] 0.958 0.954    NA    NA    NA    NA    NA    NA    NA    NA 0.930    NA
## [49]    NA    NA 0.948 0.943 0.948 0.951    NA    NA    NA    NA    NA    NA
## [61]    NA    NA    NA    NA 0.951    NA 0.933 0.945 0.961    NA    NA    NA
## [73]    NA    NA    NA 0.934    NA 0.934 0.941 0.955 0.961 0.950 0.951    NA
## [85]    NA    NA    NA    NA    NA 0.935 0.931
```

```
#17


#p2
prop2 <- c()
for (j in 10:100){
  k <- 0
  for (i in 1:1000){
    x<-rbern(j,p2)
    CI <- BinomCI(sum(x[1:j]), j, 0.95, method = "wald")
    if (CI[2]<p2 && CI[3]>p2){
      k <- k+1
    }
  }
  prop2 <- c(prop2,k/1000)

}
w2<-c()
for (i in 1:length(prop2)){
  if (prop2[i]>= 0.93){
    w2[i]<-prop2[i]
  }
}
w2
```

```
##  [1]    NA    NA    NA 0.945 0.939    NA    NA    NA    NA    NA    NA    NA
## [13] 0.932 0.957    NA    NA    NA    NA    NA 0.930 0.947 0.942    NA    NA
## [25]    NA    NA    NA 0.945 0.953    NA    NA 0.936 0.932 0.936 0.942 0.950
```

```
## [37]    NA    NA 0.937 0.938 0.933    NA 0.958    NA    NA    NA 0.946 0.945
## [49] 0.952 0.947    NA 0.934    NA 0.930 0.957 0.956    NA    NA    NA 0.931
## [61] 0.931 0.954 0.962 0.931    NA 0.932 0.946 0.945 0.945    NA 0.939 0.938
## [73] 0.943 0.951 0.952 0.941    NA 0.932 0.938 0.951 0.936 0.953    NA    NA
## [85] 0.953 0.938 0.931 0.968 0.942    NA 0.932
```

```
#4

#p3
prop3 <- c()
for (j in 10:100){
  k <- 0
  for (i in 1:1000){
    x<-rbern(j,p3)
    CI <- BinomCI(sum(x[1:j]), j, 0.95, method = "wald")
    if (CI[2]<p3 && CI[3]>p3){
      k <- k+1
    }
  }
  prop3 <- c(prop3,k/1000)

}
w3<-c()
for (i in 1:length(prop3)){
  if (prop3[i]>= 0.93){
    w3[i]<-prop3[i]
  }
}
w3
```

```
##  [1]    NA    NA    NA    NA    NA 0.961    NA    NA    NA    NA 0.952    NA
## [13]    NA    NA 0.943 0.956    NA    NA 0.940 0.946 0.948    NA 0.935 0.938
## [25] 0.936    NA    NA 0.957 0.952    NA    NA 0.938 0.935 0.951 0.937 0.946
## [37] 0.938 0.952 0.930    NA 0.935 0.932    NA 0.935    NA 0.941 0.950 0.932
## [49]    NA 0.937 0.958    NA 0.943 0.948 0.933    NA 0.934 0.959 0.952 0.942
## [61] 0.946 0.951 0.953 0.937    NA 0.941 0.954 0.936    NA 0.953 0.954    NA
## [73] 0.947 0.941 0.951    NA    NA 0.951 0.941 0.931 0.952 0.937 0.947 0.933
## [85] 0.940    NA 0.953 0.931 0.934 0.956 0.953
```

```
#5


#p4
prop4 <- c()
for (j in 10:100){
  k <- 0
  for (i in 1:1000){
    x<-rbern(j,p4)
    CI <- BinomCI(sum(x[1:j]), j, 0.95, method = "wald")
    if (CI[2]<p4 && CI[3]>p4){
      k <- k+1
    }
  }
  prop4 <- c(prop4,k/1000)
```

```
}
w4<-c()
for (i in 1:length(prop4)){
  if (prop4[i]>= 0.93){
    w4[i]<-prop4[i]
  }
}
w4
```

```
##  [1]    NA 0.949    NA    NA 0.930 0.944    NA    NA 0.950    NA 0.933 0.932
## [13] 0.963    NA    NA    NA    NA    NA 0.950    NA    NA    NA 0.962    NA
## [25] 0.945 0.936 0.937 0.945 0.963    NA 0.956 0.937 0.953 0.942 0.958    NA
## [37] 0.950 0.948    NA    NA 0.942    NA 0.937 0.947    NA 0.951 0.946 0.962
## [49] 0.952 0.959    NA 0.944 0.954    NA 0.951 0.941    NA 0.952 0.947 0.939
## [61] 0.952 0.953 0.943 0.935 0.955 0.932 0.941 0.941 0.933 0.944 0.947 0.942
## [73] 0.956 0.946 0.935 0.956 0.940 0.951 0.958    NA 0.942 0.945 0.942 0.931
## [85] 0.952 0.953 0.953 0.951 0.935 0.957 0.947
```

```
#2
#p5
prop5 <- c()
for (j in 10:100){
  k <- 0
  for (i in 1:1000){
    x<-rbern(j,p5)
    CI <- BinomCI(sum(x[1:j]), j, 0.95, method = "wald")
    if (CI[2]<p5 && CI[3]>p5){
      k <- k+1
    }
  }
  prop5 <- c(prop5,k/1000)

}
w5<-c()
for (i in 1:length(prop5)){
  if (prop5[i]>= 0.93){
    w5[i]<-prop5[i]
  }
}
w5
```

```
##  [1]    NA 0.931    NA    NA 0.945    NA    NA 0.964    NA 0.935 0.953    NA
## [13] 0.946    NA 0.950 0.959    NA 0.953    NA 0.943 0.950    NA 0.953    NA
## [25] 0.936 0.960 0.941 0.957 0.935 0.948 0.933 0.936 0.936 0.939 0.962 0.939
## [37] 0.957    NA 0.947 0.959    NA 0.944 0.932 0.954 0.936 0.947 0.958 0.944
## [49] 0.939 0.937 0.932 0.934 0.950 0.954    NA 0.954    NA 0.936    NA 0.952
## [61] 0.950 0.953 0.955 0.958 0.953 0.934 0.950    NA 0.959 0.960 0.938 0.959
## [73] 0.931 0.949 0.943 0.943 0.935 0.943    NA 0.943 0.946 0.940 0.951 0.933
## [85] 0.946 0.943 0.952    NA 0.949 0.954 0.941
```

```
#2
```

```r
#AC


#p1
prop1 <- c()
for (j in 10:100){
  k <- 0
  for (i in 1:1000){
    x<-rbern(j,p1)
    CI <- BinomCI(sum(x[1:j]), j, 0.95, method = "agresti-coull")
    if (CI[2]<p1 && CI[3]>p1){
      k <- k+1
    }
  }
  prop1 <- c(prop1,k/1000)

}
w1<-c()
for (i in 1:length(prop1)){
  if (prop1[i]>= 0.93){
    w1[i]<-prop1[i]
  }
}
w1
```

```
##  [1]    NA 0.983 0.972 0.969 0.951 0.947 0.987 0.980 0.975 0.957 0.965 0.944
## [13] 0.975 0.979 0.968 0.953 0.963 0.954 0.983 0.977 0.973 0.969 0.966 0.968
## [25] 0.955 0.978 0.983 0.968 0.977 0.969 0.963 0.981 0.963 0.960 0.966 0.968
## [37] 0.957 0.949 0.966 0.968 0.965 0.970 0.959 0.972 0.949 0.985 0.975 0.976
## [49] 0.970 0.965 0.946 0.956 0.953 0.971 0.966 0.966 0.958 0.957 0.957 0.958
## [61] 0.966 0.968 0.961 0.963 0.948 0.960 0.939 0.942 0.967 0.965 0.964 0.966
## [73] 0.952 0.960 0.942 0.973 0.975 0.966 0.955 0.964 0.952 0.957 0.939 0.962
## [85] 0.963 0.967 0.964 0.958 0.960 0.959 0.971
```

```r
#1


#p2
prop2 <- c()
for (j in 10:100){
  k <- 0
  for (i in 1:1000){
    x<-rbern(j,p2)
    CI <- BinomCI(sum(x[1:j]), j, 0.95, method = "wald")
    if (CI[2]<p2 && CI[3]>p2){
      k <- k+1
    }
  }
  prop2 <- c(prop2,k/1000)

}
w2<-c()
for (i in 1:length(prop2)){
  if (prop2[i]>= 0.93){
```

```
    w2[i]<-prop2[i]
  }
}
w2
```

```
##  [1]    NA    NA    NA 0.941 0.952    NA    NA    NA    NA    NA    NA 0.946
## [13] 0.935 0.942    NA    NA    NA    NA    NA    NA 0.947 0.955    NA    NA
## [25]    NA 0.932 0.937 0.938 0.949    NA    NA 0.934 0.933    NA 0.931 0.947
## [37]    NA    NA 0.931 0.931 0.930 0.952 0.952    NA    NA    NA 0.944    NA
## [49] 0.944 0.943    NA    NA 0.935 0.941 0.949 0.949    NA    NA 0.931 0.935
## [61] 0.942 0.939 0.951    NA    NA    NA 0.946 0.945 0.951    NA    NA 0.935
## [73] 0.936 0.941 0.947 0.961 0.933 0.935    NA 0.946 0.949 0.940    NA 0.934
## [85] 0.951 0.942 0.932 0.958 0.939 0.936 0.937
```

```
#4

#p3
prop3 <- c()
for (j in 10:100){
  k <- 0
  for (i in 1:1000){
    x<-rbern(j,p3)
    CI <- BinomCI(sum(x[1:j]), j, 0.95, method = "wald")
    if (CI[2]<p3 && CI[3]>p3){
      k <- k+1
    }
  }
  prop3 <- c(prop3,k/1000)

}
w3<-c()
for (i in 1:length(prop3)){
  if (prop3[i]>= 0.93){
    w3[i]<-prop3[i]
  }
}
w3
```

```
##  [1]    NA    NA    NA    NA    NA 0.955    NA    NA    NA 0.931 0.945    NA
## [13]    NA    NA 0.949 0.960    NA    NA    NA 0.937 0.957    NA 0.936 0.939
## [25] 0.939    NA    NA 0.942 0.943    NA 0.933 0.931 0.932 0.938    NA 0.944
## [37] 0.944 0.943    NA 0.939 0.940    NA 0.936 0.936 0.936 0.946 0.953 0.932
## [49] 0.942 0.945 0.948 0.939 0.946 0.940 0.950    NA 0.941 0.951 0.957 0.935
## [61]    NA 0.942 0.939    NA 0.932    NA 0.947    NA 0.930 0.940 0.943 0.941
## [73] 0.935 0.942 0.961 0.932    NA 0.959 0.951 0.931 0.937 0.956 0.939 0.941
## [85] 0.941 0.951 0.936 0.937 0.944 0.961 0.964
```

```
#6


#p4
prop4 <- c()
for (j in 10:100){
  k <- 0
  for (i in 1:1000){
```

```
    x<-rbern(j,p4)
    CI <- BinomCI(sum(x[1:j]), j, 0.95, method = "wald")
    if (CI[2]<p4 && CI[3]>p4){
      k <- k+1
    }
  }
  prop4 <- c(prop4,k/1000)

}
w4<-c()
for (i in 1:length(prop4)){
  if (prop4[i]>= 0.93){
    w4[i]<-prop4[i]
  }
}
w4
```

```
##  [1]    NA 0.936    NA    NA 0.942 0.938    NA    NA 0.945    NA    NA 0.932
## [13] 0.952    NA 0.935    NA    NA    NA 0.958    NA 0.933    NA 0.944    NA
## [25] 0.945 0.949 0.939 0.942 0.958    NA 0.949 0.944 0.943 0.935 0.961 0.932
## [37] 0.946 0.948 0.938 0.935 0.945    NA 0.945 0.940    NA 0.938 0.935 0.935
## [49] 0.949 0.939 0.941 0.951 0.952 0.936 0.948 0.948 0.951 0.930 0.954    NA
## [61] 0.944 0.937 0.950 0.941 0.967    NA 0.945 0.950 0.935 0.935 0.957 0.950
## [73] 0.947 0.945 0.940 0.958 0.938 0.942 0.946    NA 0.944 0.944 0.944 0.939
## [85] 0.953 0.937 0.937 0.946 0.943 0.952 0.954
```

```
#2

#p5
prop5 <- c()
for (j in 10:100){
  k <- 0
  for (i in 1:1000){
    x<-rbern(j,p5)
    CI <- BinomCI(sum(x[1:j]), j, 0.95, method = "wald")
    if (CI[2]<p5 && CI[3]>p5){
      k <- k+1
    }
  }
  prop5 <- c(prop5,k/1000)

}
w5<-c()
for (i in 1:length(prop5)){
  if (prop5[i]>= 0.93){
    w5[i]<-prop5[i]
  }
}
w5
```

```
##  [1]    NA    NA    NA    NA 0.938    NA    NA 0.960    NA 0.933 0.961 0.941
## [13] 0.946    NA 0.932 0.953    NA 0.944    NA 0.940 0.968    NA 0.936    NA
## [25] 0.936 0.959 0.937 0.952 0.937 0.942    NA 0.943 0.953 0.932 0.955    NA
## [37] 0.940    NA 0.939 0.958 0.942 0.942 0.951 0.941    NA 0.947 0.966 0.934
## [49] 0.953 0.930 0.960    NA 0.940 0.955 0.936 0.949 0.934 0.945 0.930 0.952
```

```
## [61] 0.934 0.939 0.964 0.945 0.959 0.946 0.943 0.957 0.945 0.960 0.939 0.965
## [73] 0.945 0.965 0.933 0.957 0.938 0.953 0.937 0.951 0.950 0.948 0.949    NA
## [85] 0.945 0.940 0.955 0.935 0.946 0.965 0.951
```

```
#2

ag<-matrix(c(17,4,5,2,2,1,4,6,2,2),nrow=2, ncol=5, TRUE)
al<-data.frame(ag)
colnames(al)<-c("p1=0.1","p2=0.2","p3=0.3","p4=0.4","p5=0.5")
rownames(al)<-c("Wald method", "AC method")
al
```

```
##             p1=0.1 p2=0.2 p3=0.3 p4=0.4 p5=0.5
## Wald method     17      4      5      2      2
## AC method        1      4      6      2      2
```

```
#Widać, że metoda Agresti-Coulla przyjmuje zdecydowanie szybciej pożądane #prawdopobieństwo ( w tym prz
#przy 17. prawd, AC- juz przy 1. @ przypadku wiekszych prawdopobienstw szybkosc
#przyjecia danego prawdopodobienstwa jest bardziej wyrownwana.
```