Exam 2018-08-27

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## Contents

1 Assignment 1 (3 points)

1.1 Question 1.1

```r
congruential_generator = function(a, m, x_zero, nmax) {

  if (nmax%%1 != 0) stop("nmax has to be an integer")

  storage = vector(mode = "numeric", length = nmax)
  storage[1] = x_zero

  for (i in 1:(nmax-1)) {
    storage[i+1] = ((a * storage[i]) %% m)
  }

  return(storage/m)
}
```
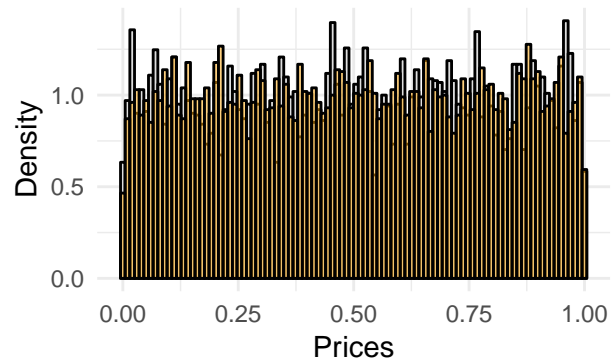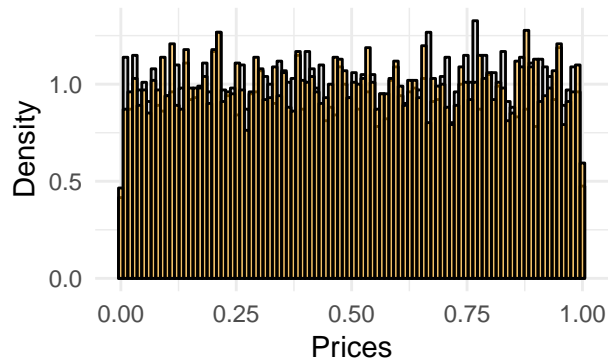
1.2 Question 1.2

```r
prs_1 = congruential_generator(69069, 2^32, 9999, 10000)
prs_2 = congruential_generator(630360016, (2^32-1), 690690, 10000)
prs_3 = congruential_generator(742938285, (2^32-1), 690690, 10000)
prs_4 = congruential_generator(1226874153, (2^32-1), 690690, 10000)

unif_samples = runif(10000)
```

Histrogram with a = 69069 and b = 2^32 Histrogram with a = 69069 and b =
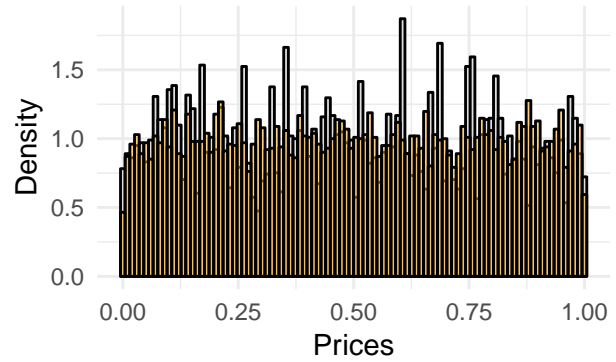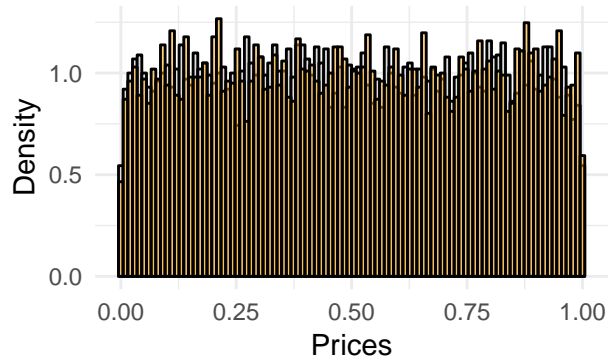
Histrogram with a = 69069 and b = 2^32 Histrogram with a = 69069 and b =

1.3 Question 1.3

2 Assignment 2

2.1 Question 2.1

2.2 Question 2.2

2.3 Question 2.3