

# Projekt zaliczeniowy

Patryk Blacha, Karolina Nitsch

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## Wstęp

## Wyniki

### Alpine01 2D

**PRS:**

- średnia: 0.0690072

**GA:**

- średnia: 0.004257

### Alpine01 10D

**PRS:**

- średnia: 9.7843879

**GA:**

- średnia: 3.2833722

### Alpine01 20D

**PRS:**

- średnia: 28.9029524

**GA:**

- średnia: 10.5712228

## **Alpine02 2D**

### **PRS:**

- średnia: -6.0698837

### **GA:**

- średnia: -6.1217208

## **Alpine02 10D**

### **PRS:**

- średnia: -903.4830969

### **GA:**

- średnia: -1158.8920016

## **Alpine02 20D**

### **PRS:**

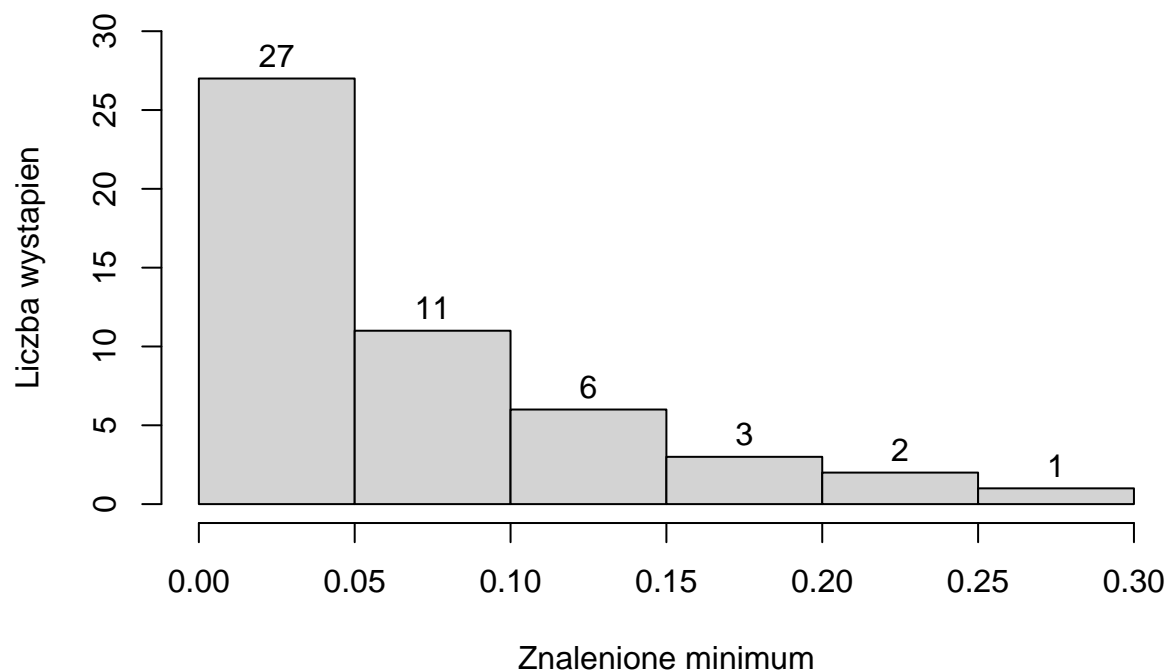
- średnia: -3.514881e+04

### **GA:**

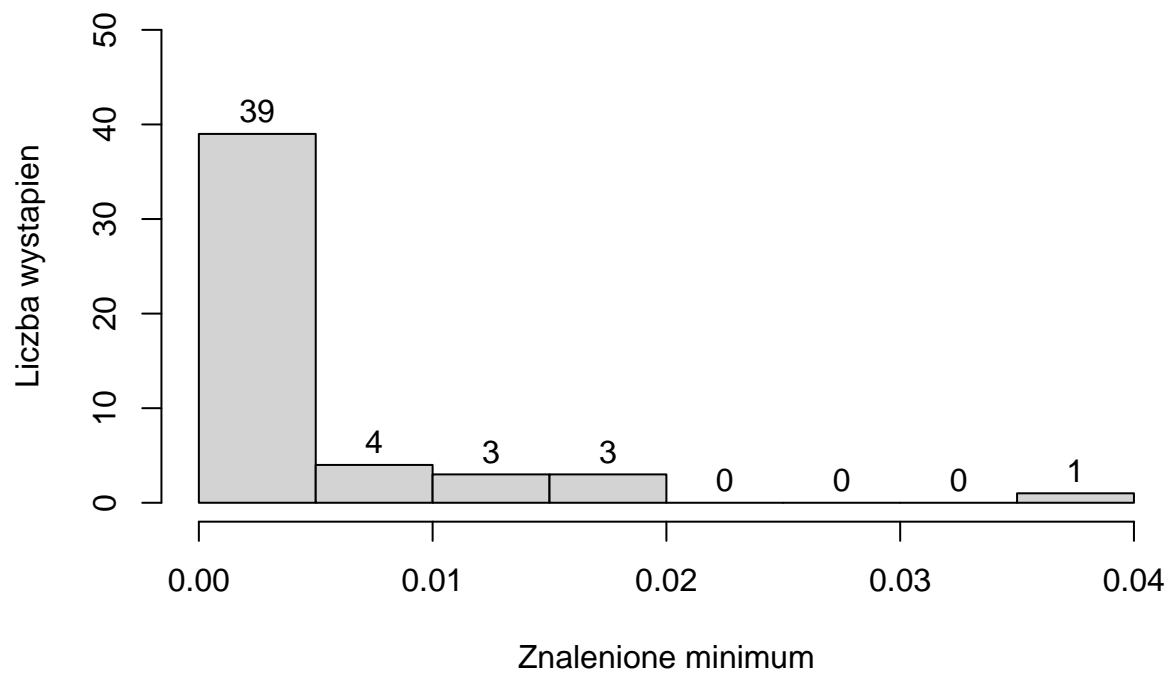
- średnia: -1.25902e+05

## Histogramy

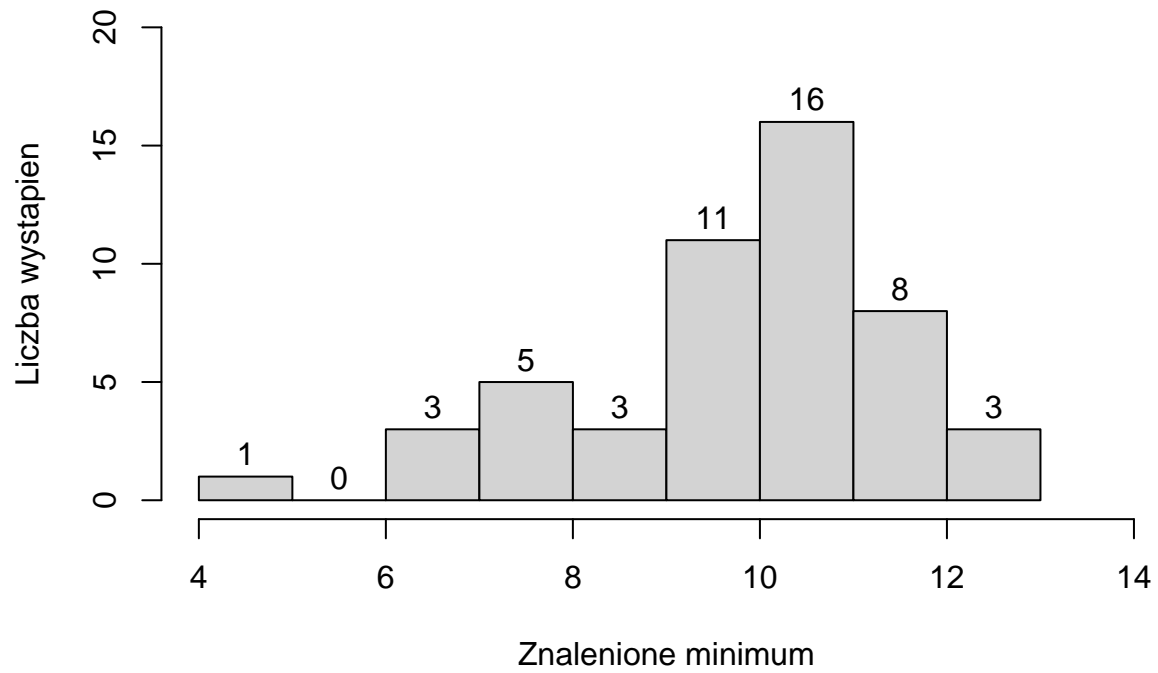
**Alpine01 2D, PRS**



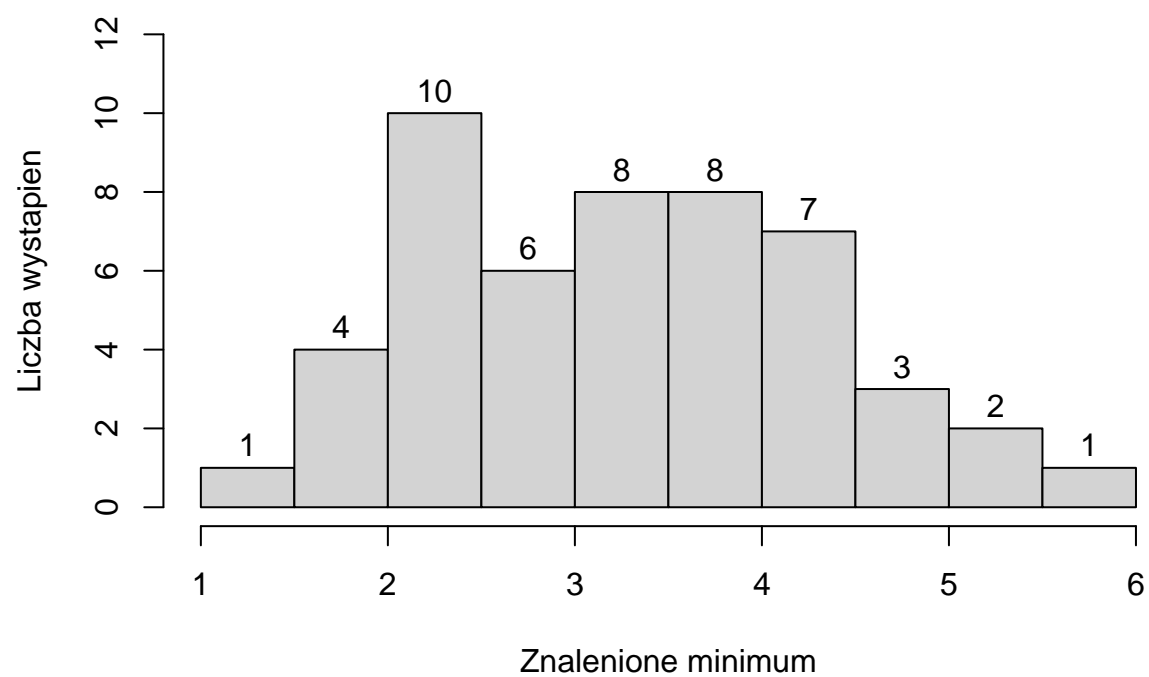
**Alpine01 2D, GA**



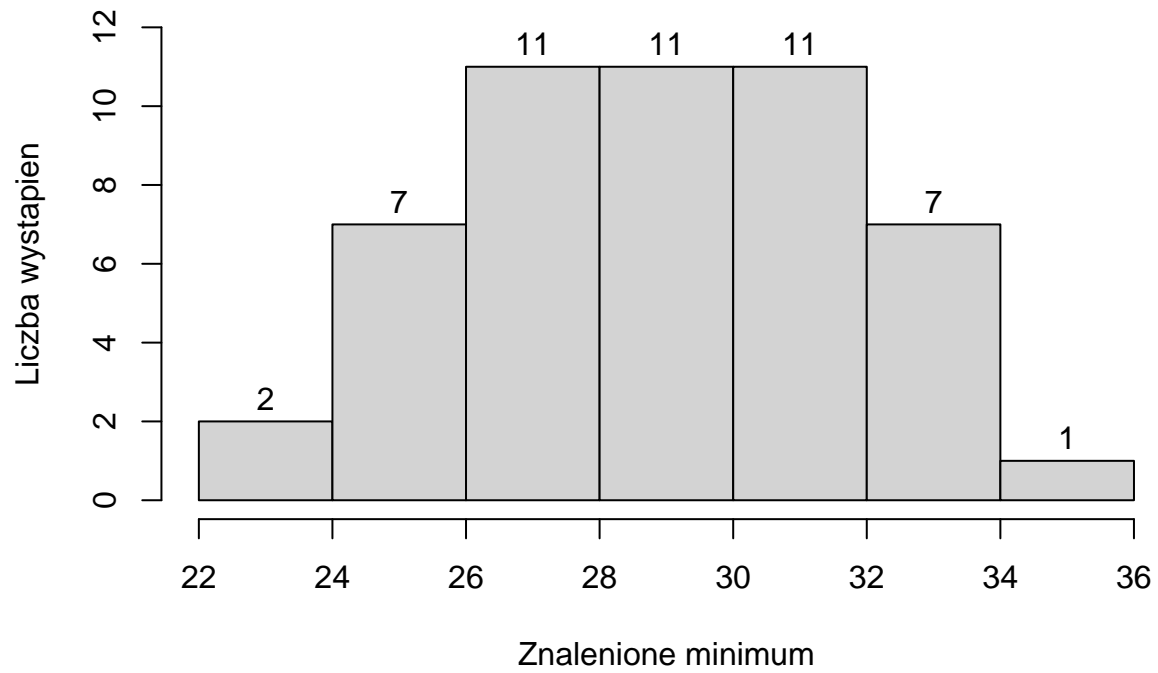
### Alpine01 10D, PRS



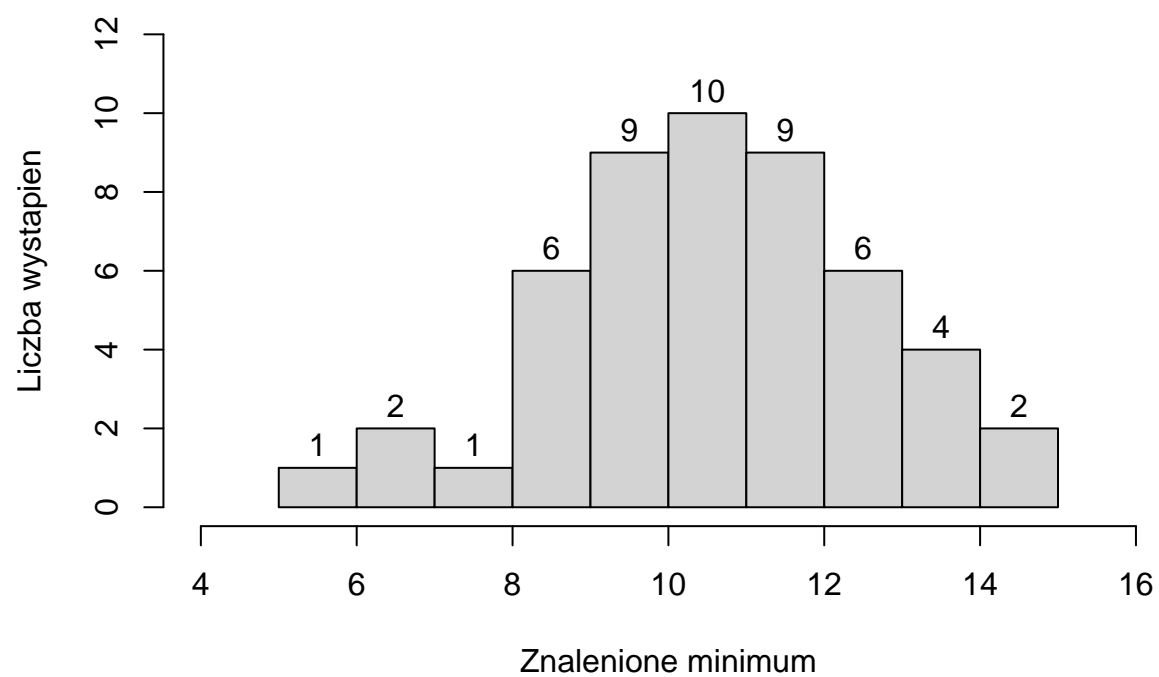
### Alpine01 10D, GA



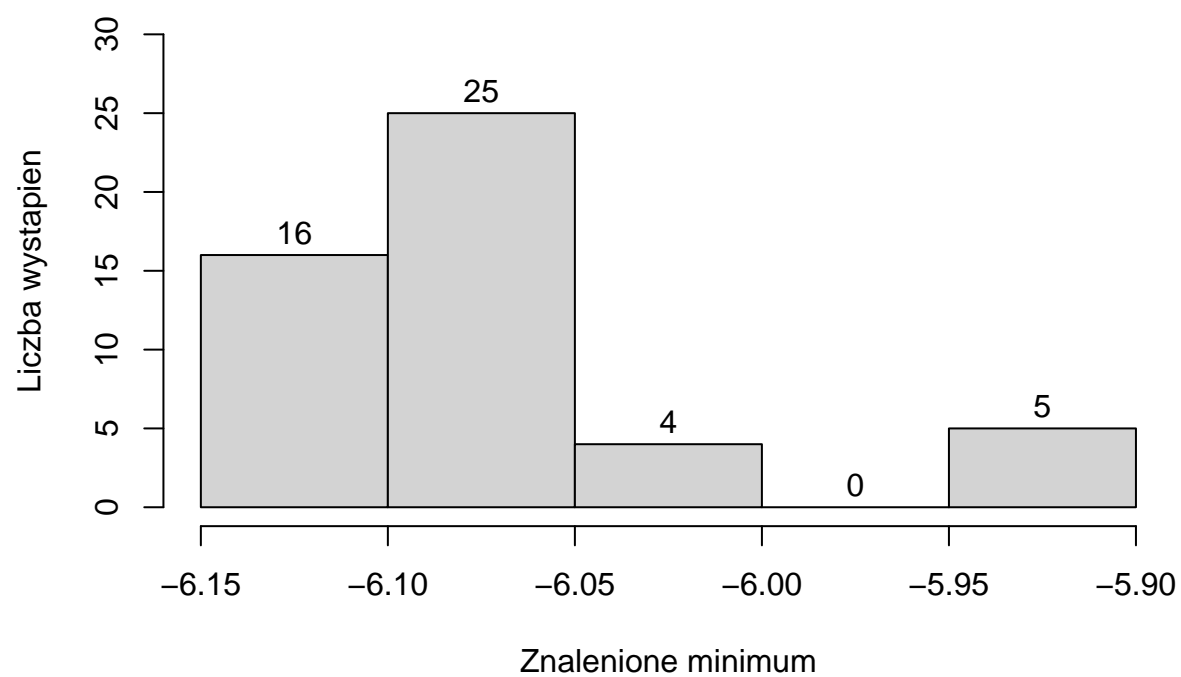
### Alpine01 20D, PRS



### Alpine01 20D, GA

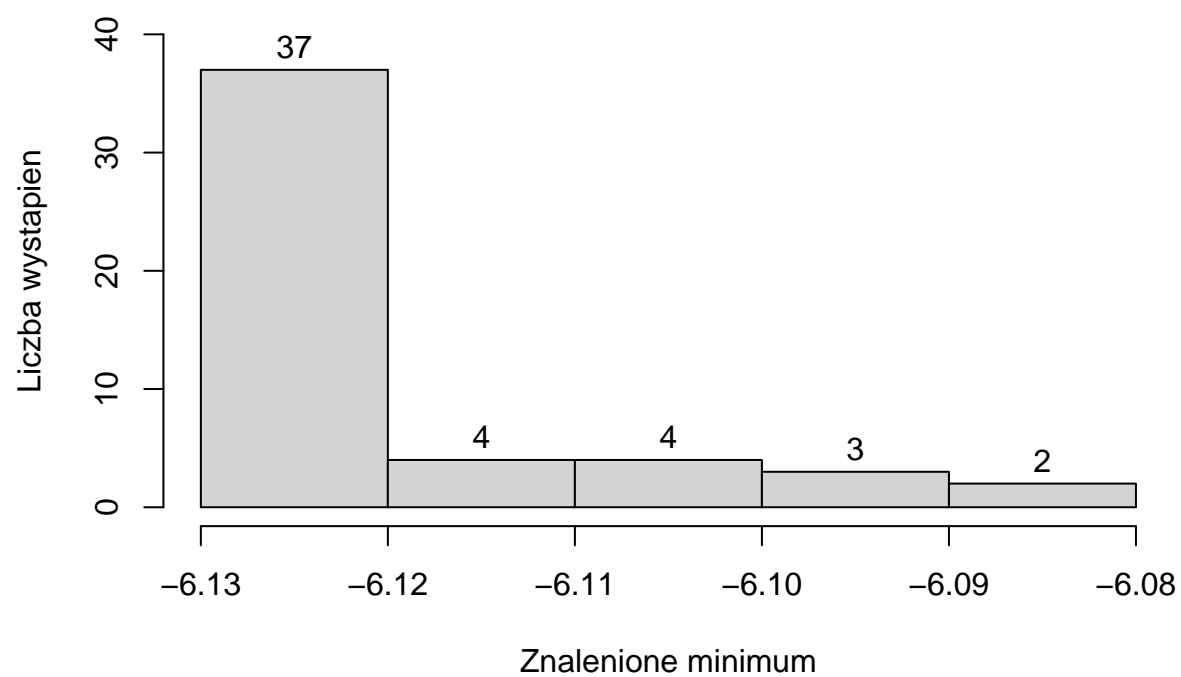


### Alpine02 2D, PRS

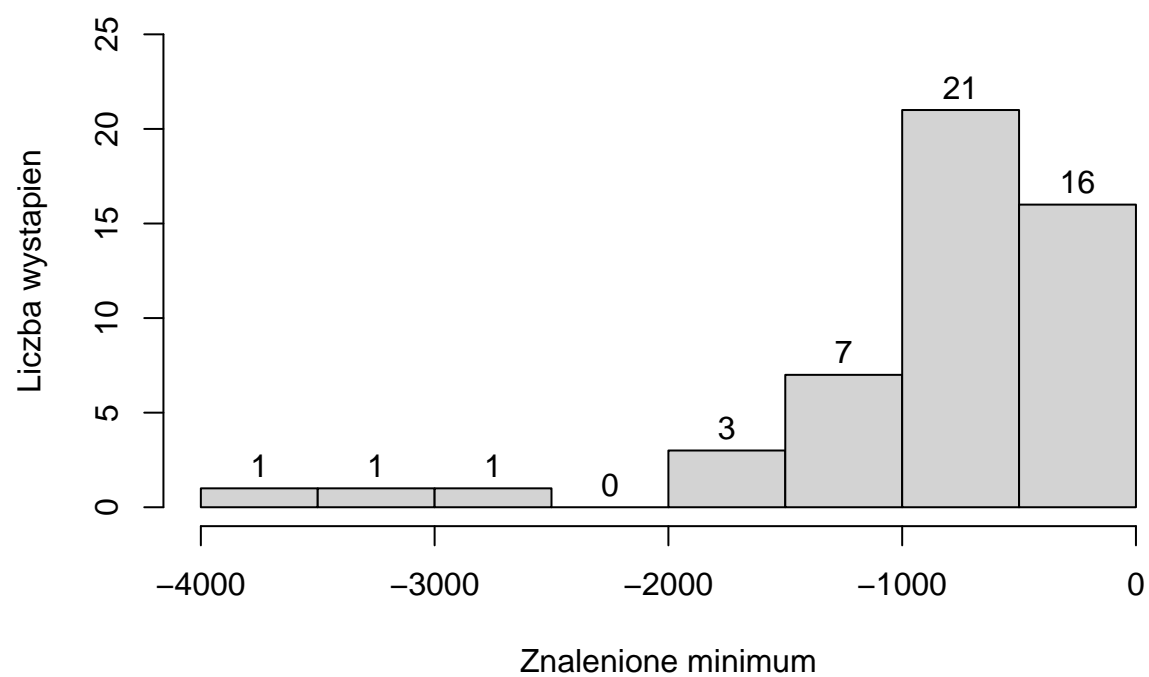




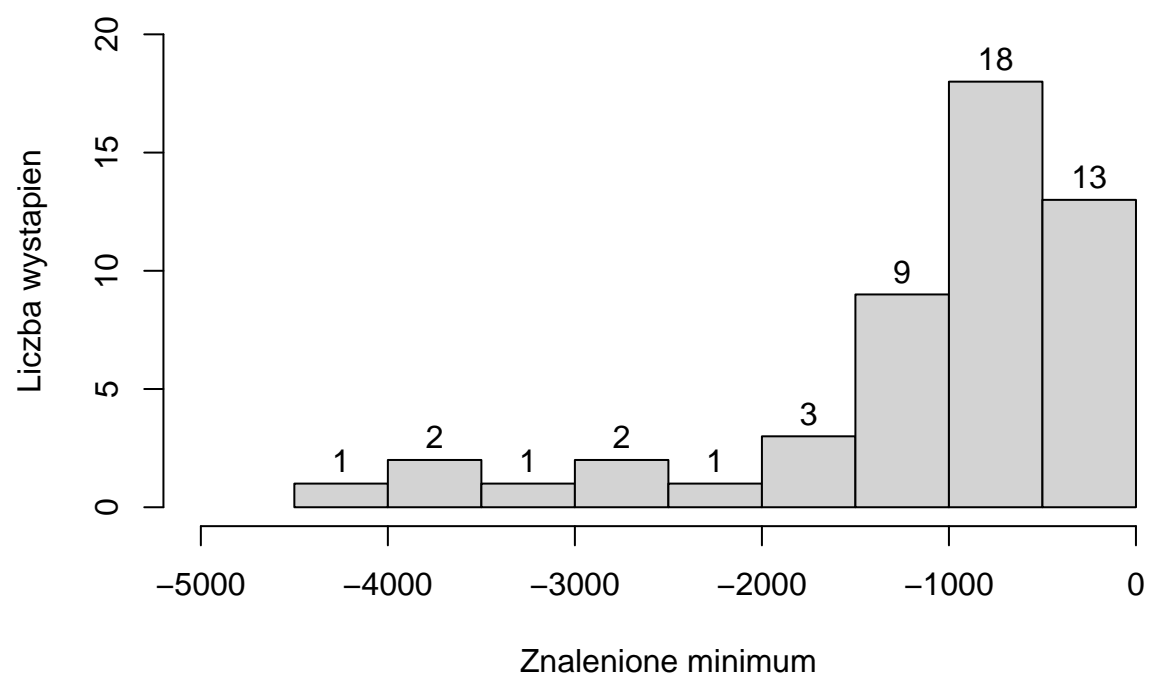
### Alpine02 2D, GA



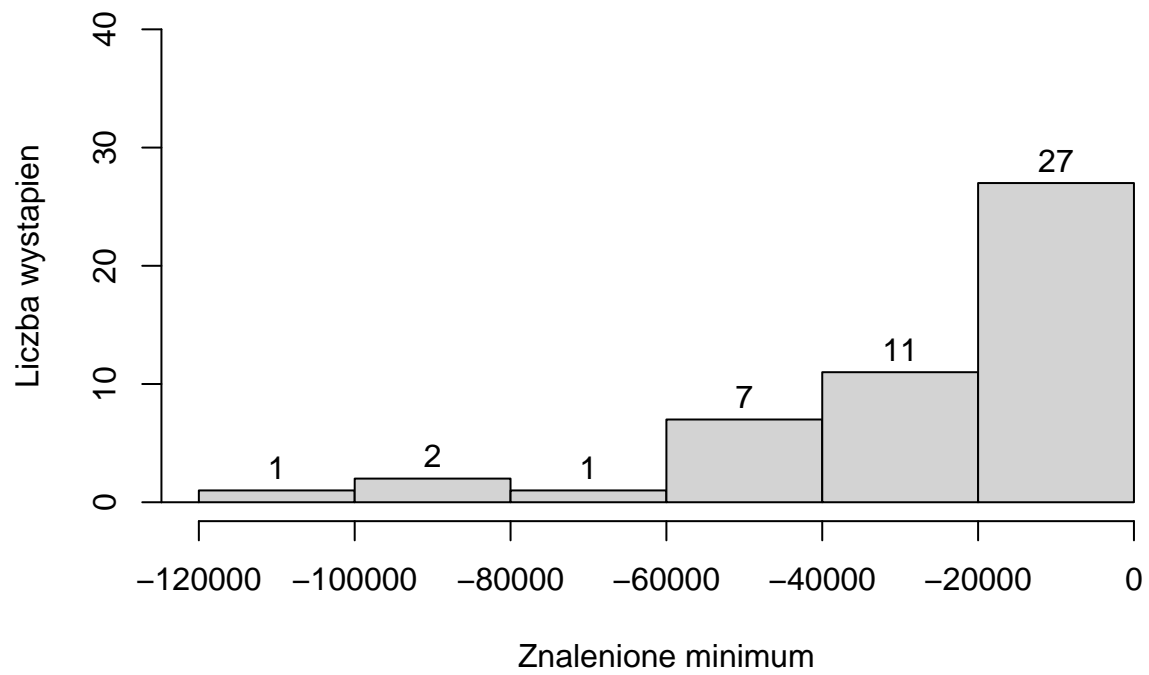
### Alpine02 10D, PRS



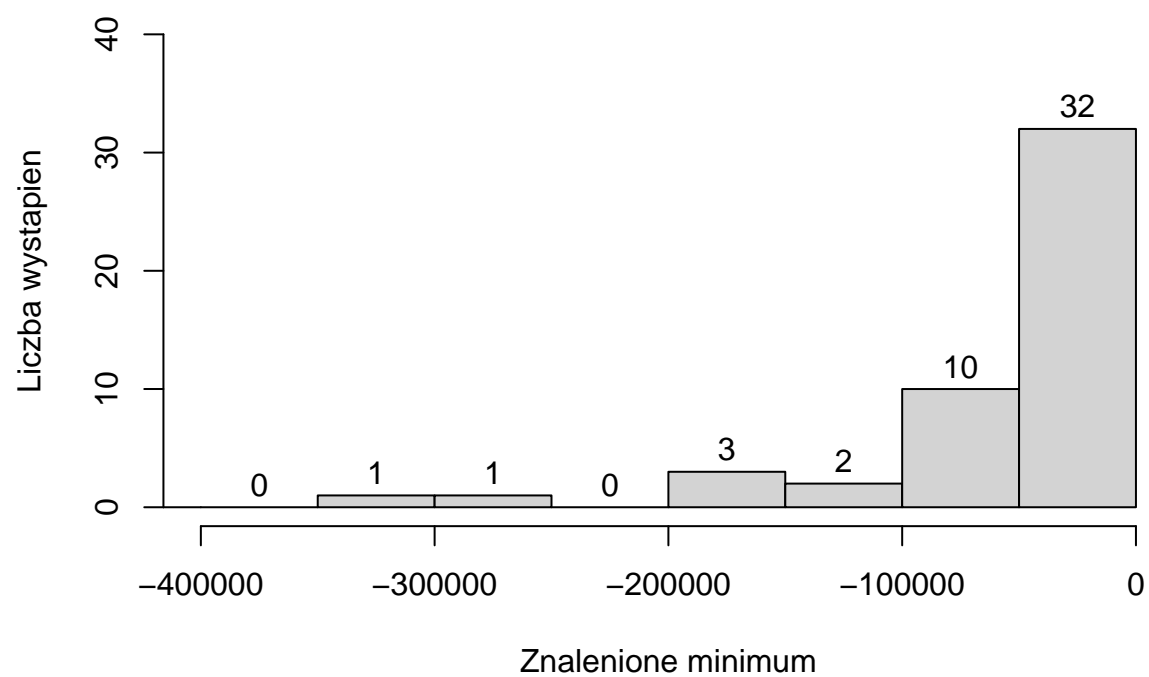
### Alpine02 10D, GA



### Alpine02 20D, PRS

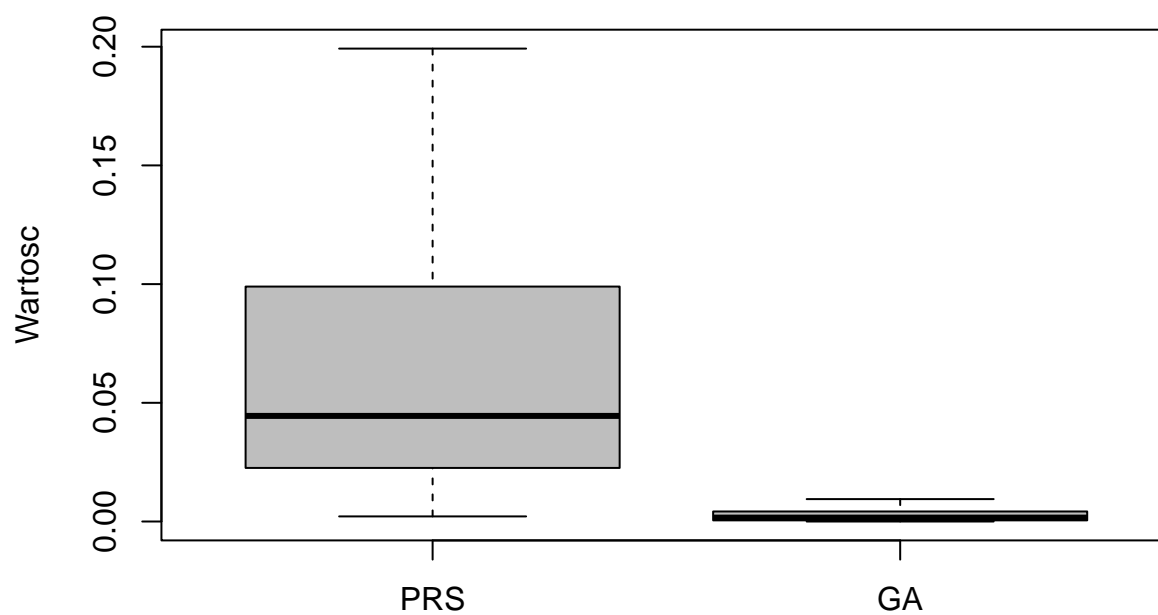


### Alpine02 20D, GA

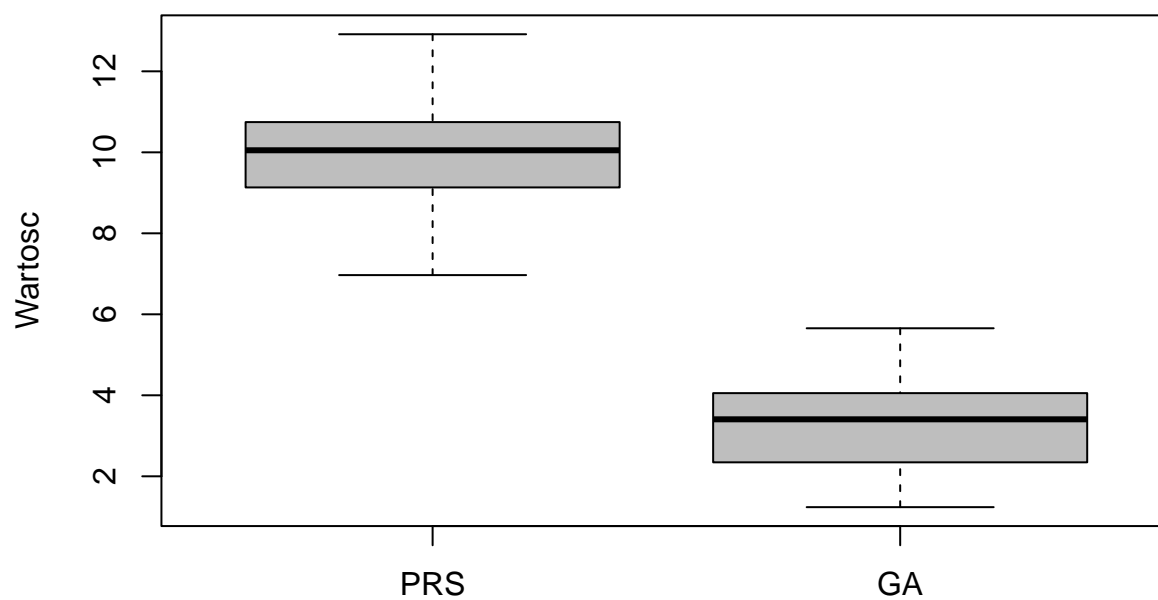


## Wykresy pudełkowe

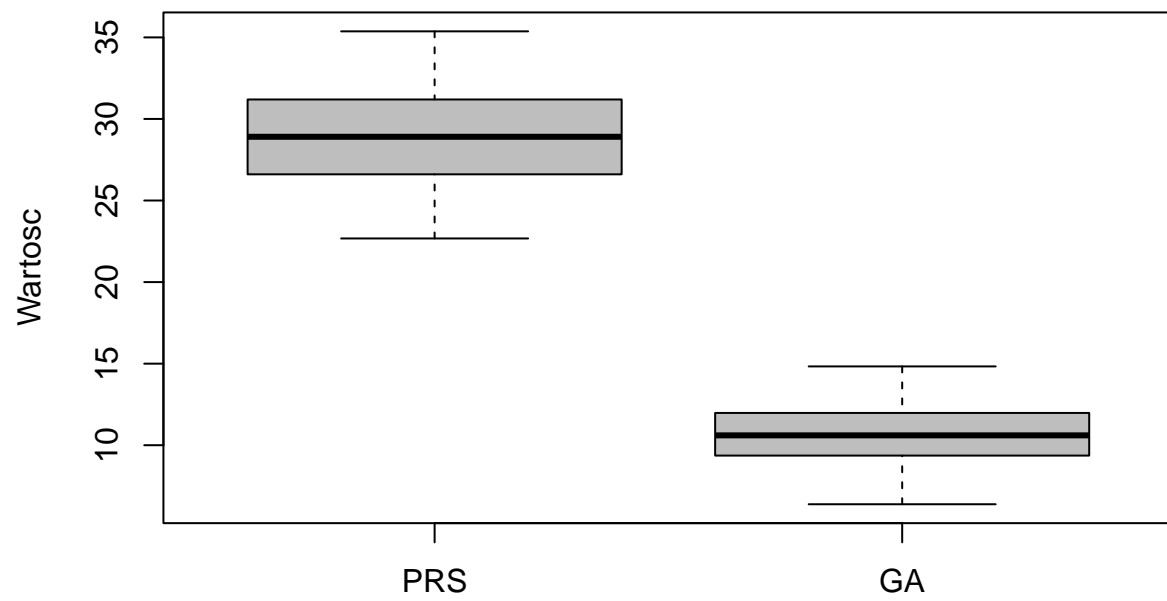
**Funkcja Alpine01, 2D**



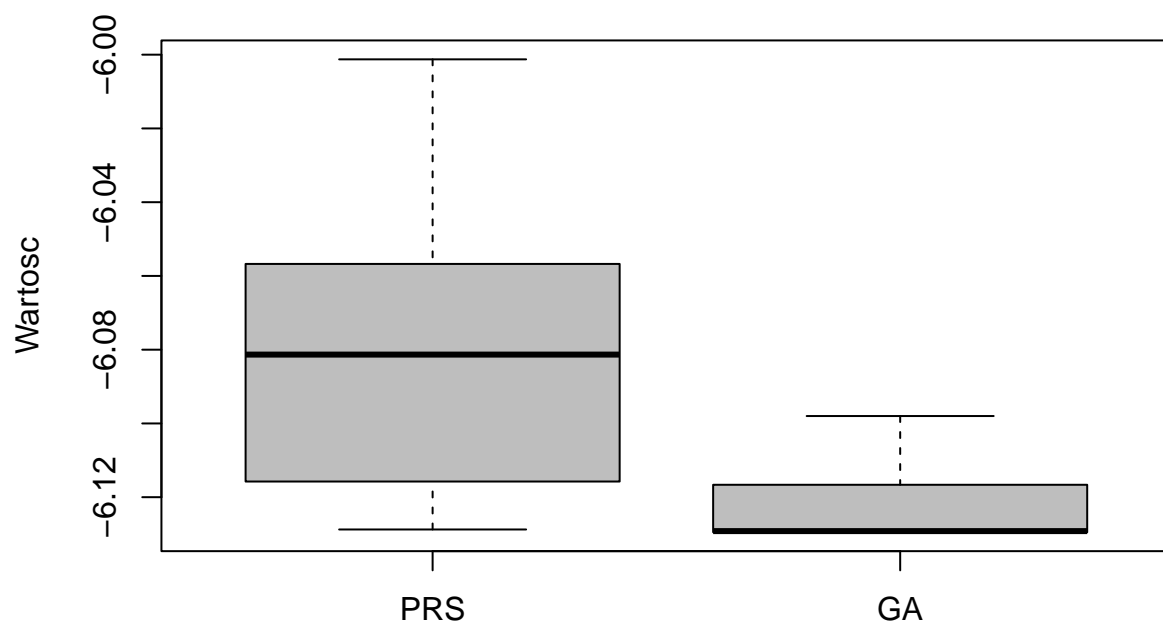
**Funkcja Alpine01, 10D**



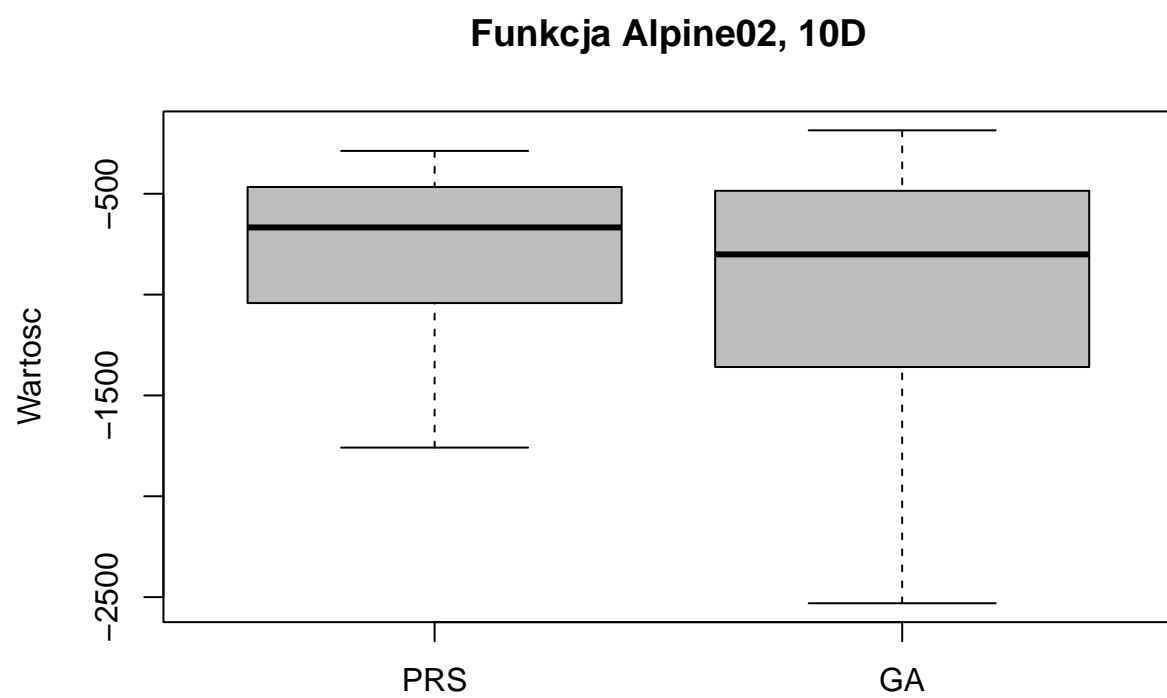
## Funkcja Alpine01, 20D

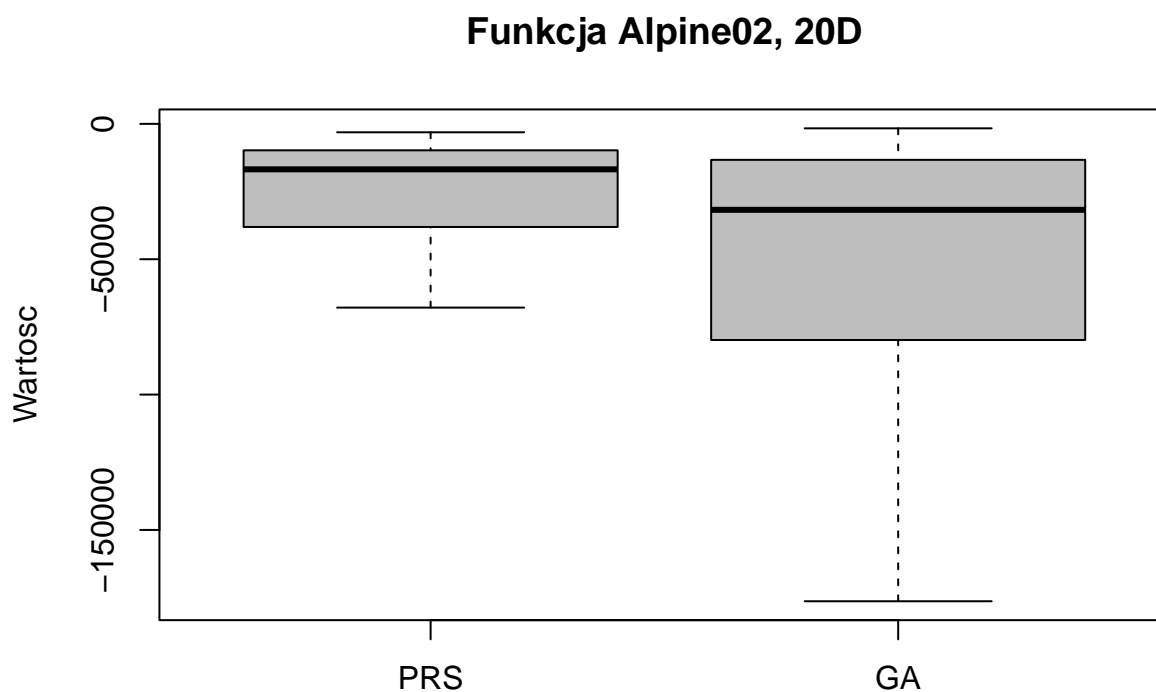


## Funkcja Alpine02, 2D









## T testy

Dla hipotezy zerowej twierdzącej że średnie są sobie równe

### Funkcja Alpine01, 2D

```
##
## Paired t-test
##
## data:  alpine01prs2D and alpine01ga2D
## t = 6.8048, df = 49, p-value = 0.00000001331
## alternative hypothesis: true mean difference is not equal to 0
## 95 percent confidence interval:
##  0.04562829 0.08387201
## sample estimates:
## mean difference
##      0.06475015
```

### Funkcja Alpine01, 10D

```
##
## Paired t-test
##
```

```
## data: alpine01prs10D and alpine01ga10D
## t = 22.47, df = 49, p-value < 2.2e-16
## alternative hypothesis: true mean difference is not equal to 0
## 95 percent confidence interval:
## 5.919608 7.082423
## sample estimates:
## mean difference
## 6.501016
```

### Funkcja Alpine01, 20D

```
##
## Paired t-test
##
## data: alpine01prs20D and alpine01ga20D
## t = 33.604, df = 49, p-value < 2.2e-16
## alternative hypothesis: true mean difference is not equal to 0
## 95 percent confidence interval:
## 17.23546 19.42800
## sample estimates:
## mean difference
## 18.33173
```

### Funkcja Alpine02, 2D

```
##
## Paired t-test
##
## data: alpine02prs2D and alpine02ga2D
## t = 6.4609, df = 49, p-value = 0.0000000454
## alternative hypothesis: true mean difference is not equal to 0
## 95 percent confidence interval:
## 0.03571393 0.06796025
## sample estimates:
## mean difference
## 0.05183709
```

### Funkcja Alpine02, 10D

```
##
## Paired t-test
##
## data: alpine02prs10D and alpine02ga10D
## t = 1.6992, df = 49, p-value = 0.09563
## alternative hypothesis: true mean difference is not equal to 0
## 95 percent confidence interval:
## -46.65886 557.47667
## sample estimates:
## mean difference
## 255.4089
```

## Funkcja Alpine02, 20D

```
##  
## Paired t-test  
##  
## data: alpine02prs20D and alpine02ga20D  
## t = 1.2644, df = 49, p-value = 0.2121  
## alternative hypothesis: true mean difference is not equal to 0  
## 95 percent confidence interval:  
## -53483.91 234990.32  
## sample estimates:  
## mean difference  
## 90753.21
```

## Wniosek:

GA okazało się istotnie lepsze dla funkcji Alpine01 we wszystkich badanych wymiarach. Dla funkcji Alpine02 istotną różnicę odnotowaliśmy jedynie dla 2 wymiarów. Podsumowując na podstawie przeprowadzonych testów można stwierdzić że algorytm genetyczny(GA) w większości przypadków osiąga lepsze wyniki niż metoda czysto losowa(PRS).