Domaći zadatak 2015/2016:
Neuralne mreže

Roško, Bojan
2013/0102 SI

Veinović, Relja
2013/0432 SI

26. januar 2016.

Sažetak:

Cilj vežbe je obučavanje perceptronske i višeslojne feedforward neuralne mreže za klasifikovanje podataka, kao i demonstracija tehnike ranog zaustavljanja.

Zadatak je rađen sa podacima iz grupe 0, PodaciA1.txt i PodaciB1.txt, sa brojevima neurona po skrivenim slojevima ([8], [20], [3,8], [25,25]), i sa aktivacionim funkcijama po slojevima ('logsig','logsig')

1. Podaci A1:

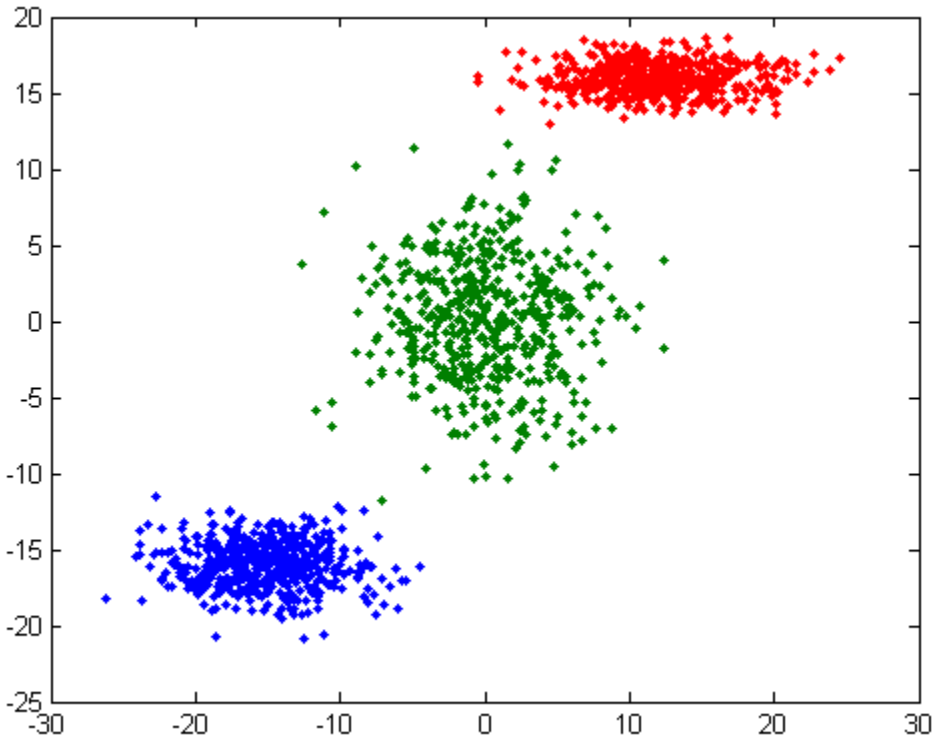

Figure 1: Podaci A1

(a) Perceptron:

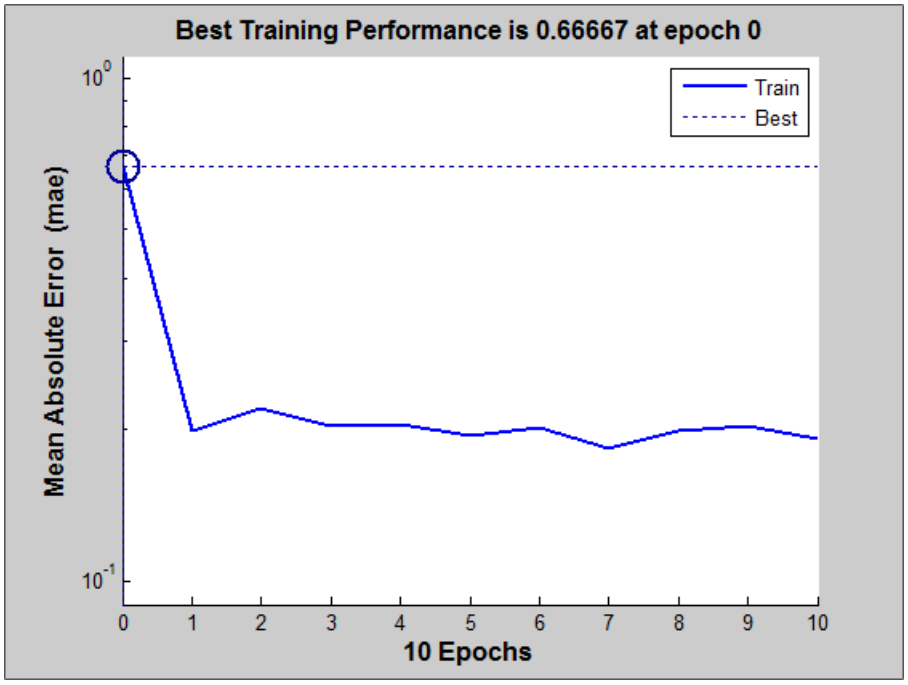

Figure 2: Performanse treniranja perceptrona

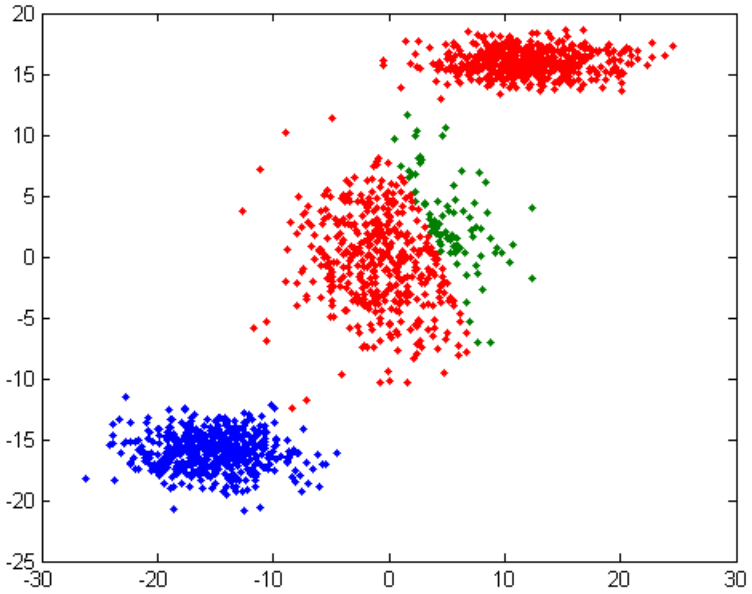

Figure 3: Izlaz perceptrona za iste ulazne podatke

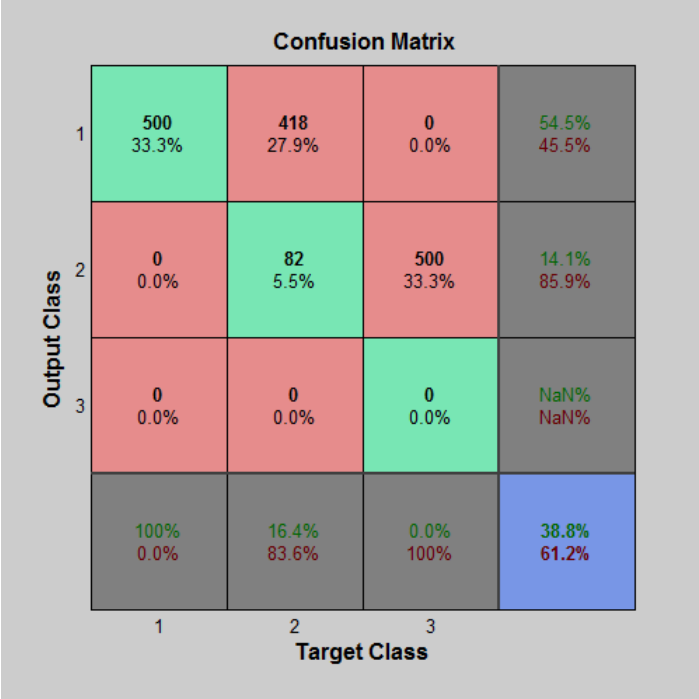

Figure 4: Confussion matrix

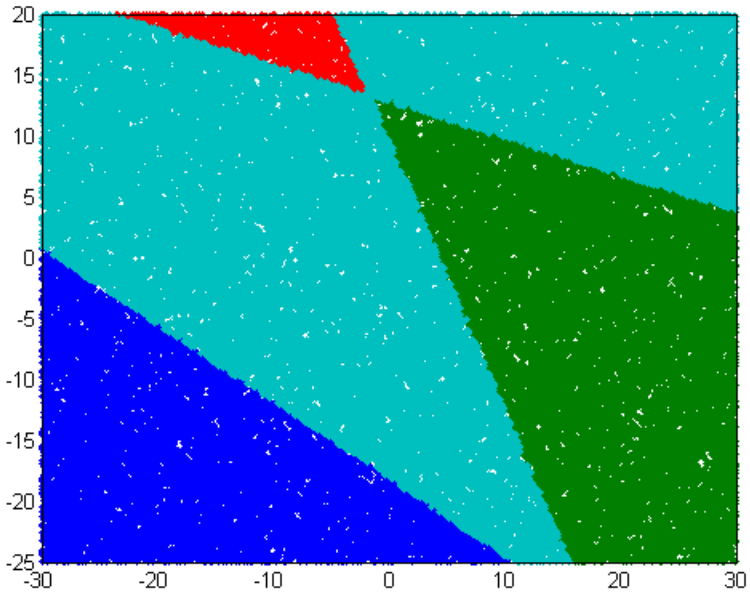

Figure 5: Izlaz perceptrona na celom opsegu

(b) Feedforward 1 sa ranim zaustavljanjem:

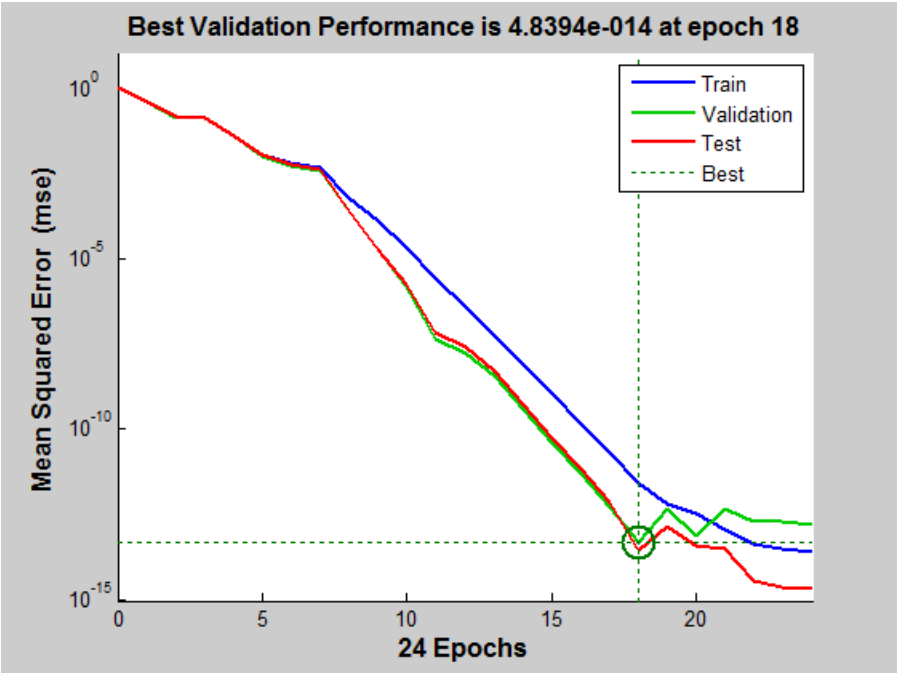

Figure 6: Performanse treniranja ff mreze sa ranim zaustavljanjem

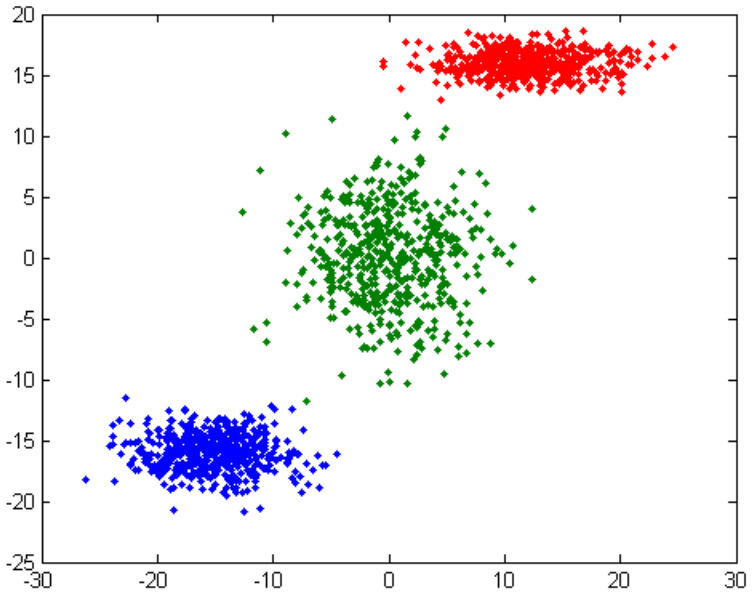

Figure 7: Izlaz ff mreze za iste ulazne podatke

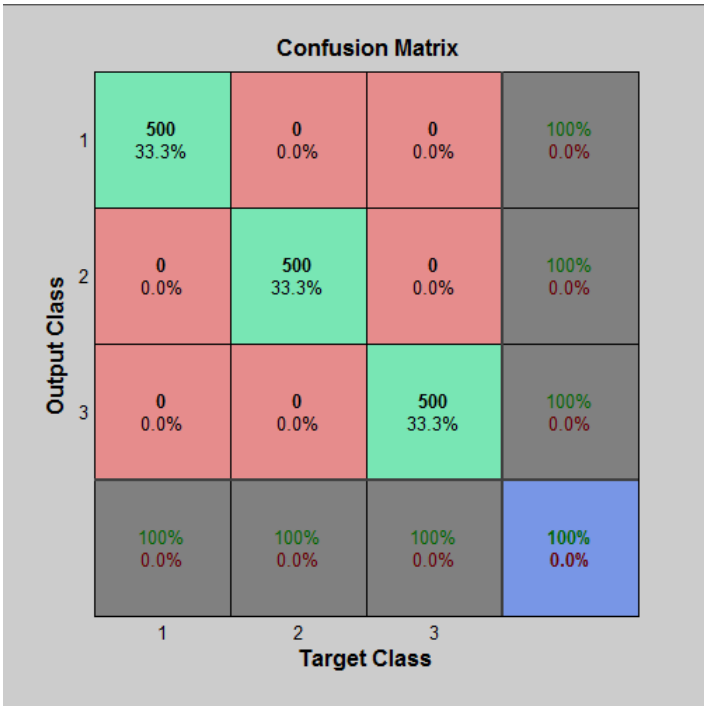

Figure 8: Confusion matrix

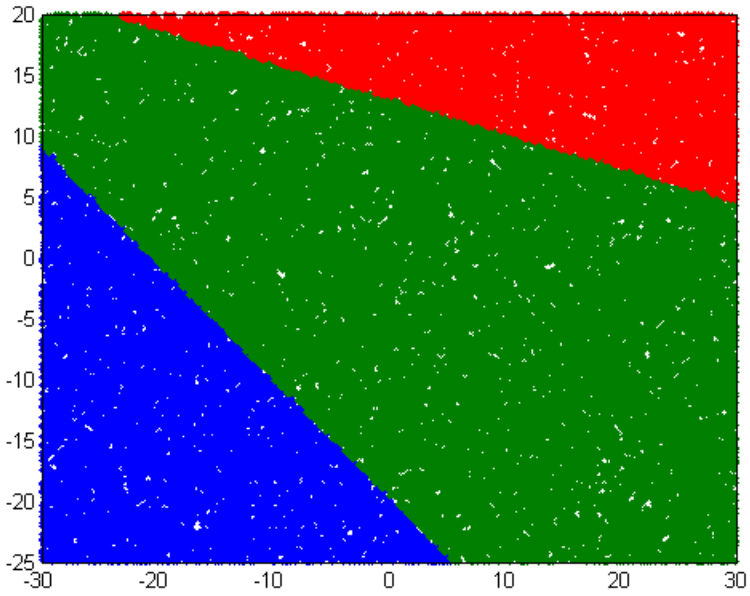

Figure 9: Izlaz ff mreze na celom opsegu

(c) Feedforward 1 bez ranog zaustavljanja:

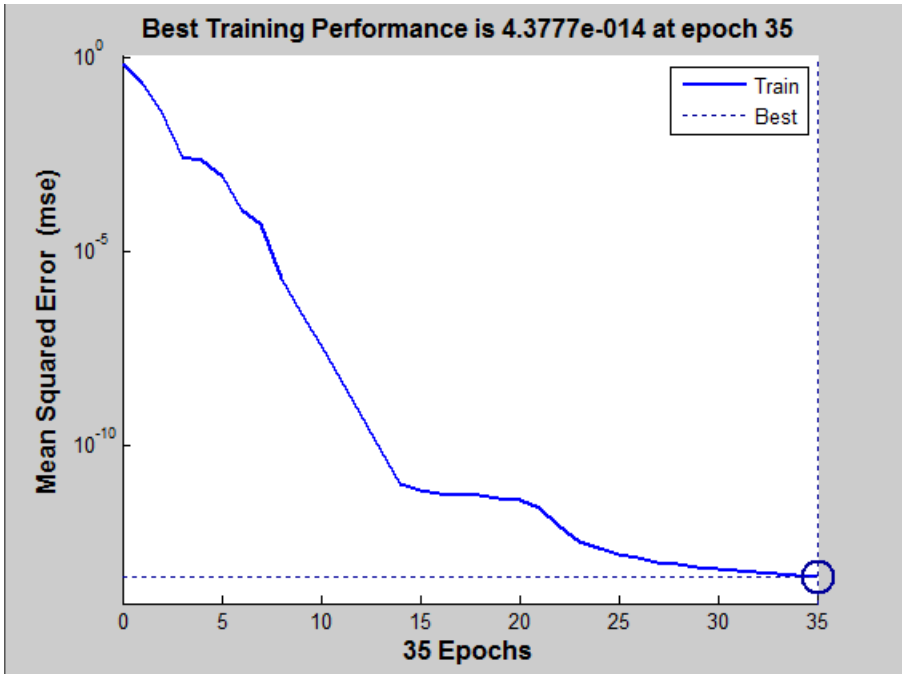

Figure 10: Performanse treniranja ff mreze sa ranim zaustavljanjem

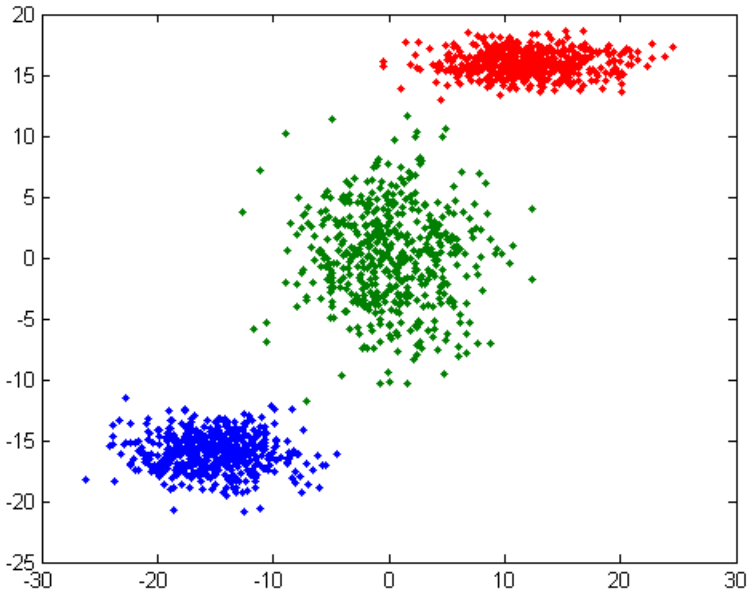

Figure 11: Izlaz ff mreze za iste ulazne podatke

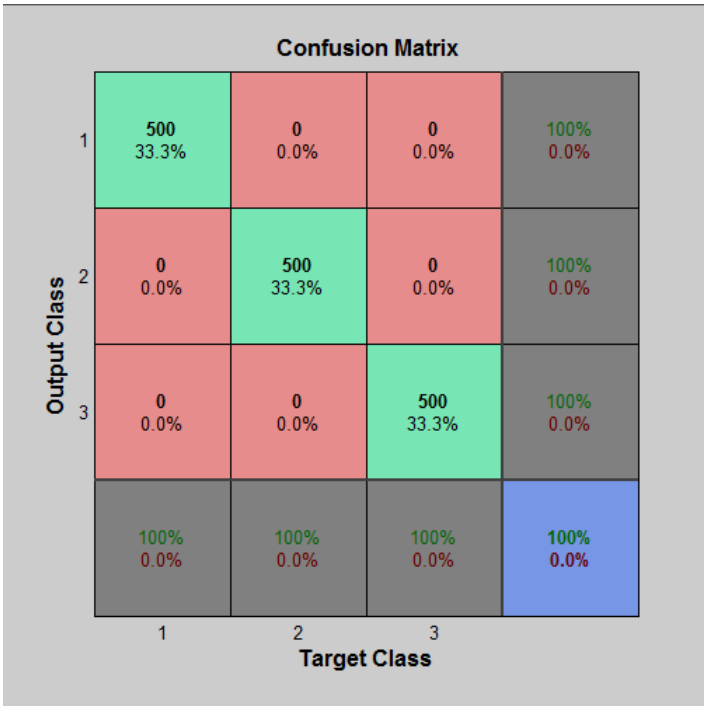

Figure 12: Confusion matrix

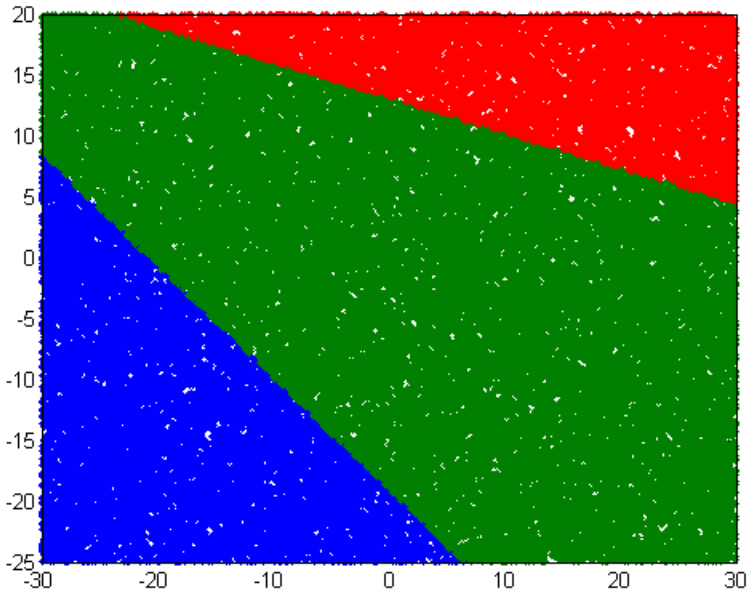

Figure 13: Izlaz ff mreze na celom opsegu

(d) Feedforward 2 sa ranim zaustavljanjem:

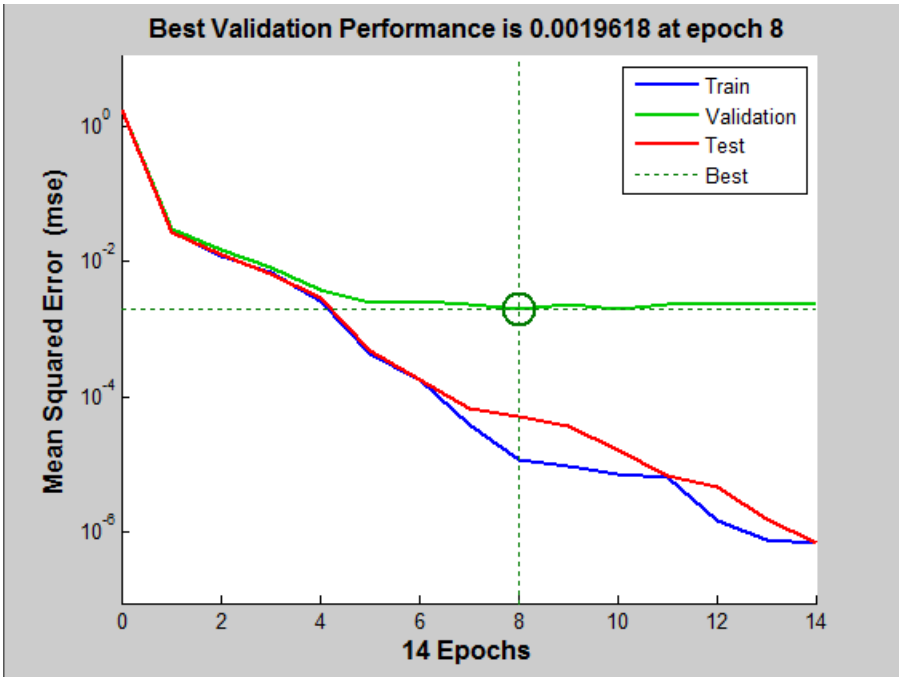

Figure 14: Performanse treniranja ff mreze sa ranim zaustavljanjem

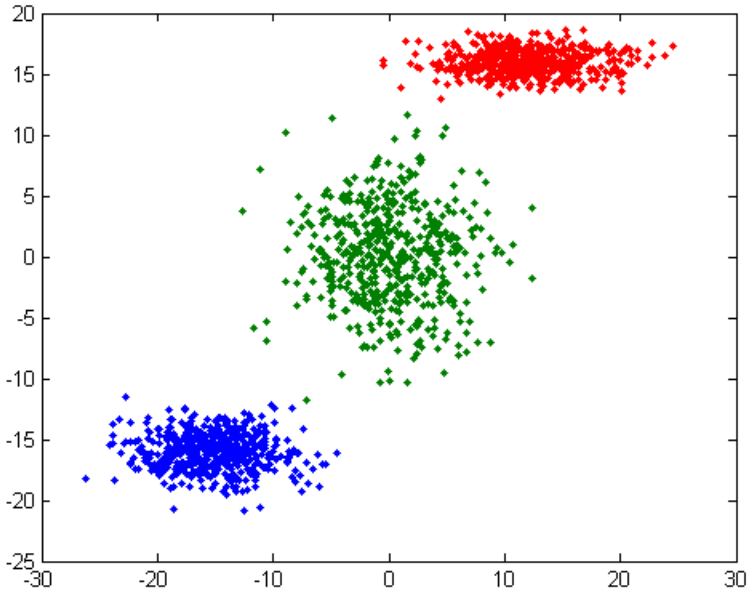

Figure 15: Izlaz ff mreze za iste ulazne podatke

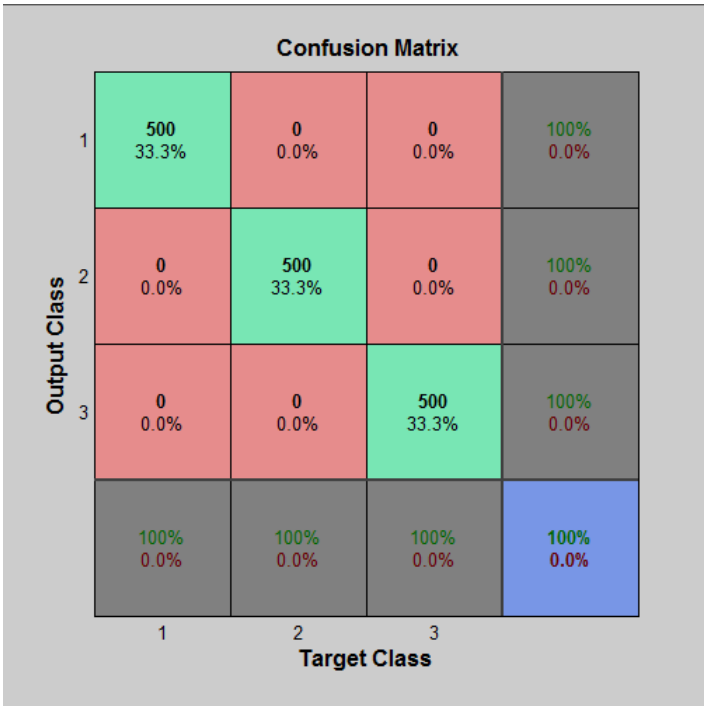

Figure 16: Confusion matrix

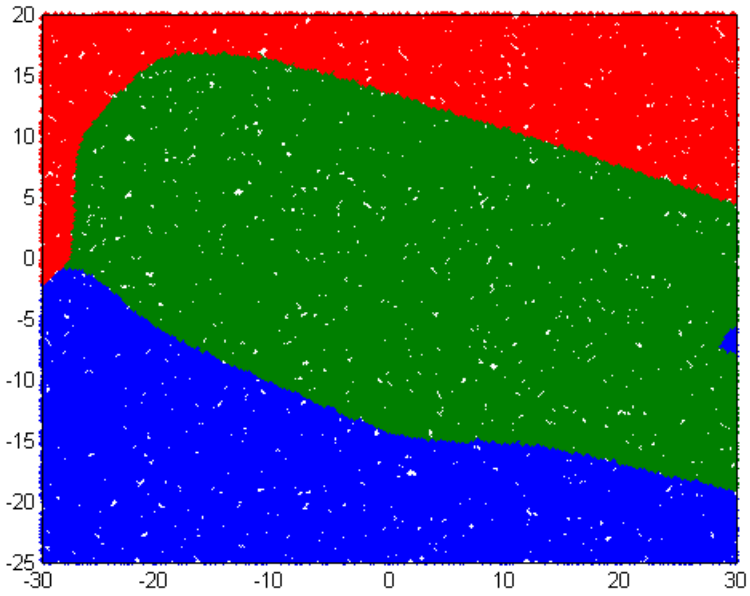

Figure 17: Izlaz ff mreze na celom opsegu

(e) Feedforward 2 bez ranog zaustavljanja:

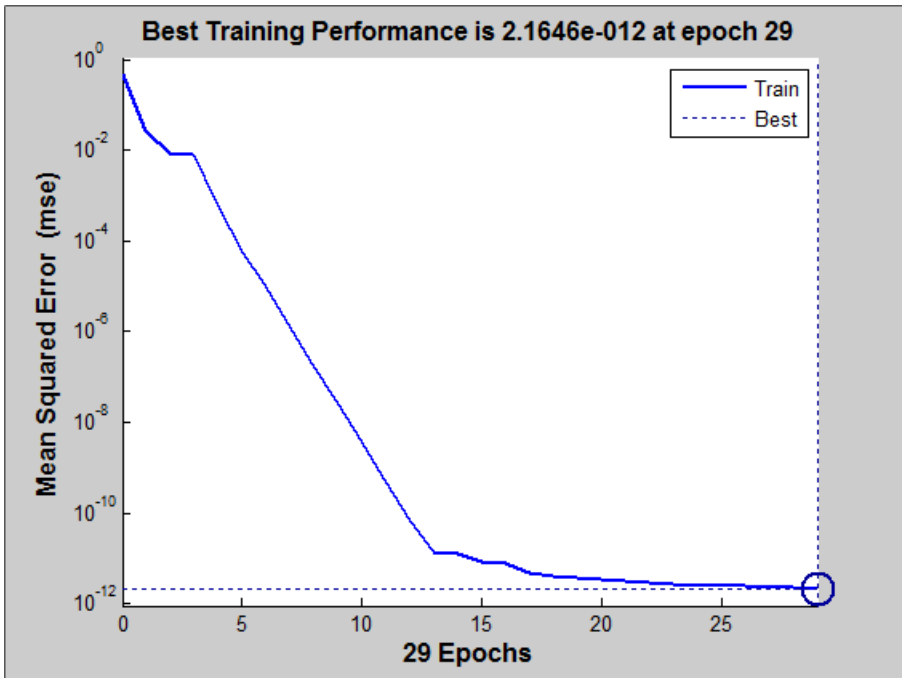

Figure 18: Performanse treniranja ff mreze sa ranim zaustavljanjem

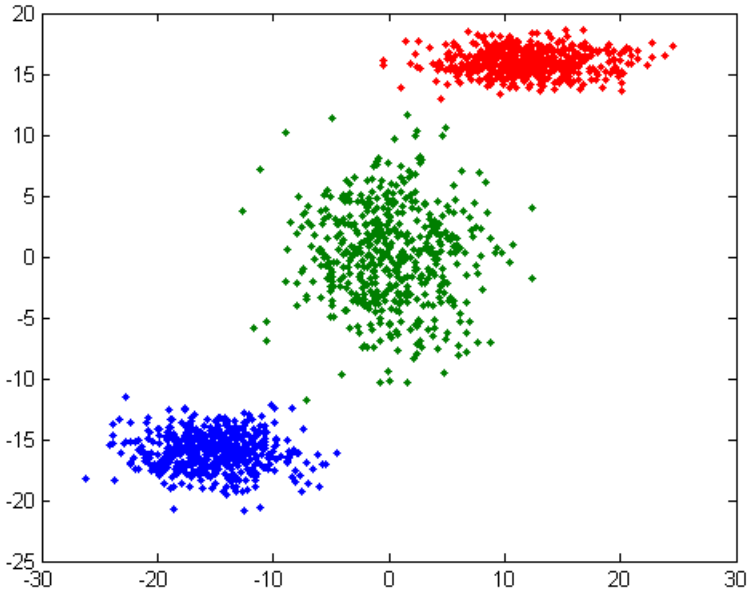

Figure 19: Izlaz ff mreze za iste ulazne podatke

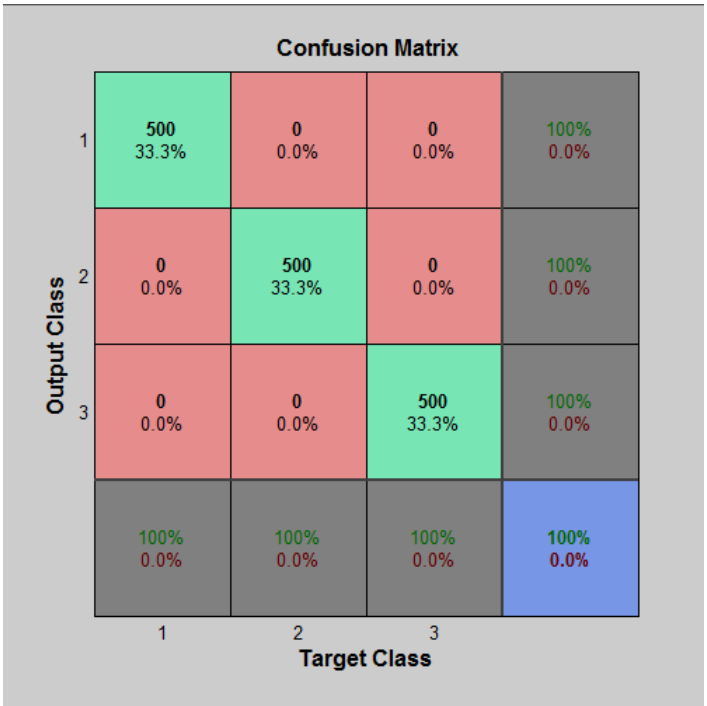

Figure 20: Confusion matrix

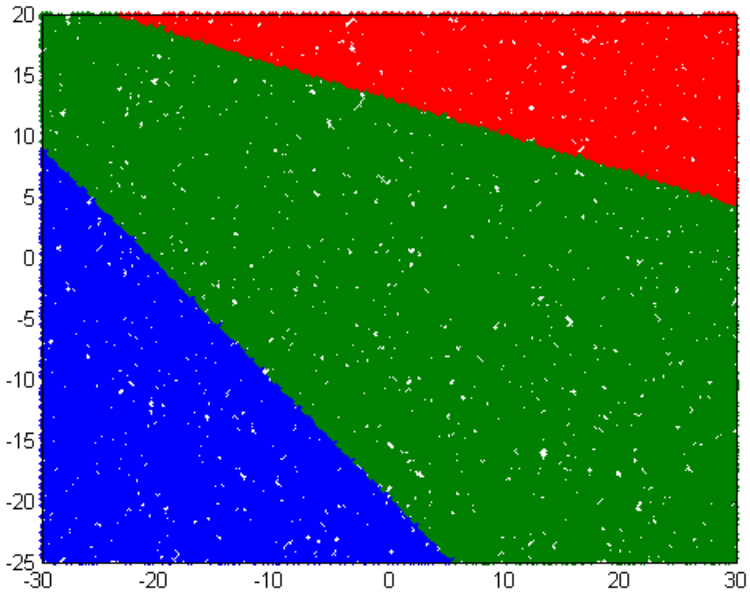

Figure 21: Izlaz ff mreze na celom opsegu

(f) Feedforward 3 sa ranim zaustavljanjem:

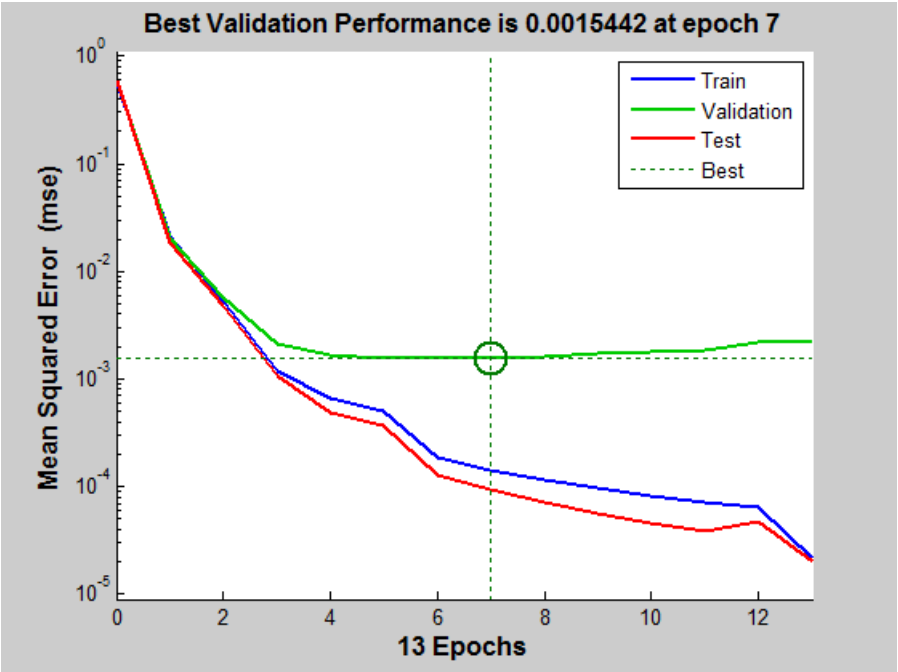

Figure 22: Performanse treniranja ff mreze sa ranim zaustavljanjem

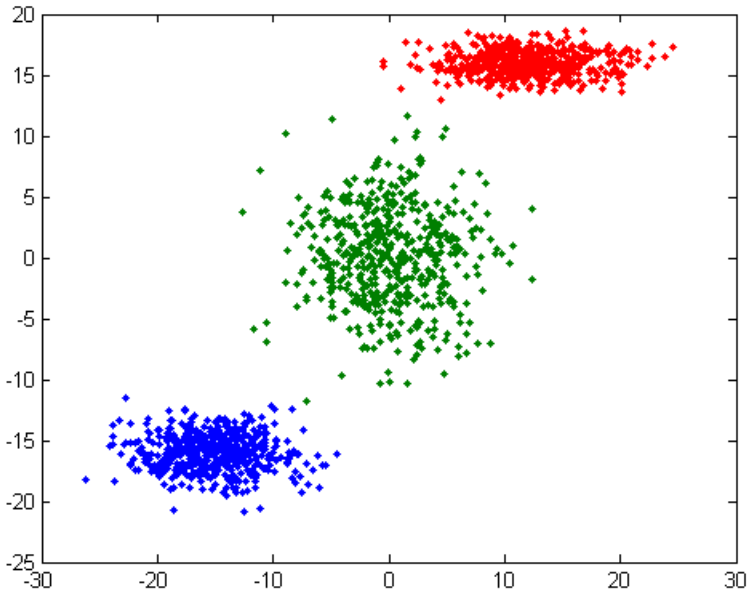

Figure 23: Izlaz ff mreze za iste ulazne podatke

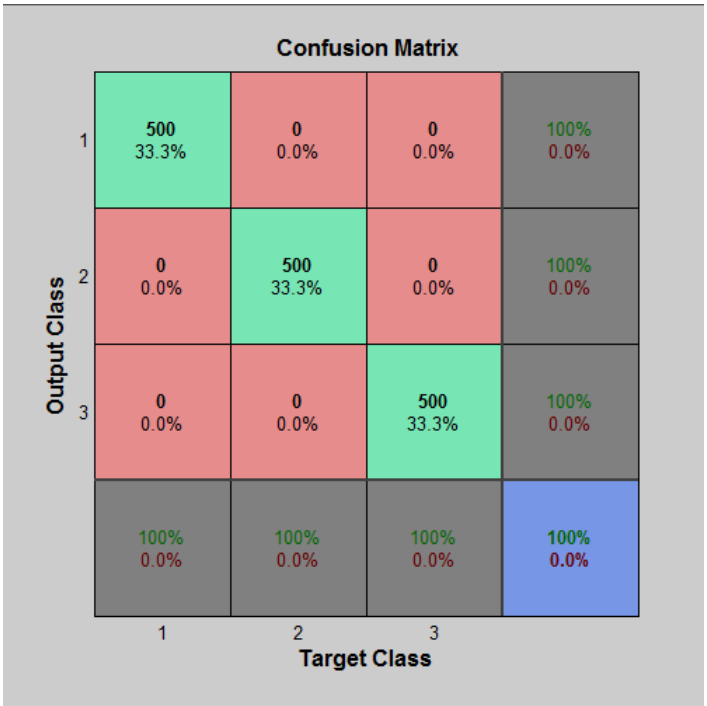

Figure 24: Confusion matrix

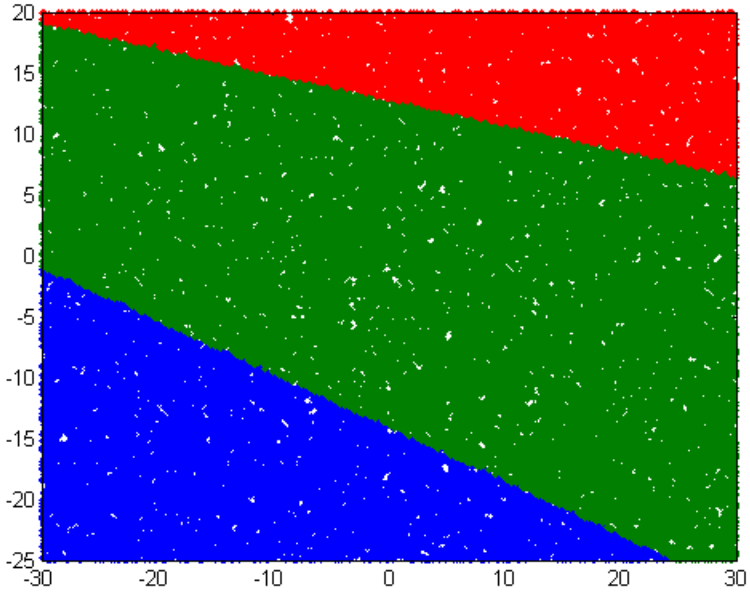

Figure 25: Izlaz ff mreze na celom opsegu

(g) Feedforward 3 bez ranog zaustavljanja:

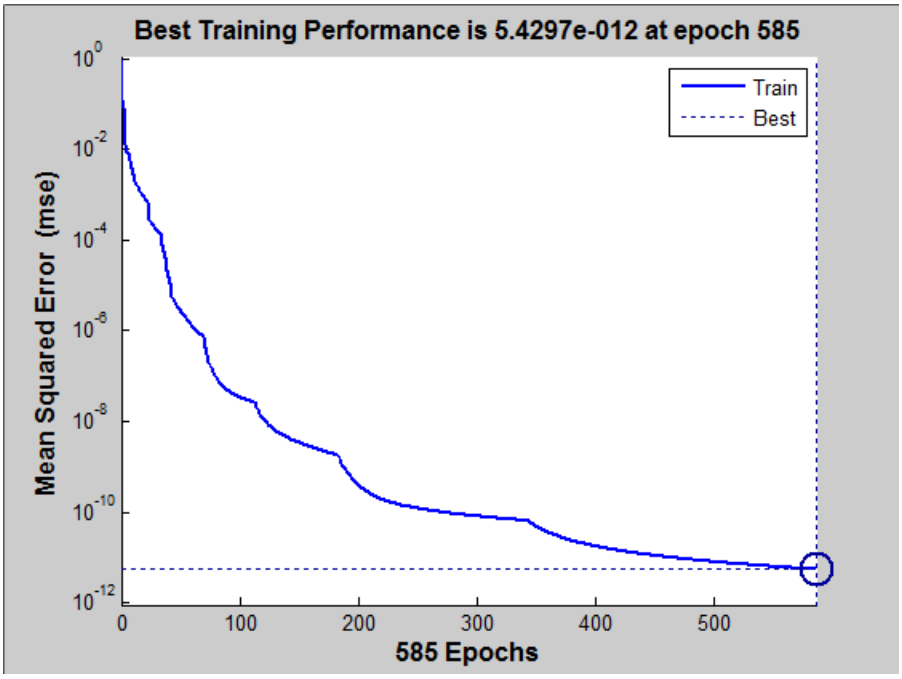

Figure 26: Performanse treniranja ff mreze sa ranim zaustavljanjem

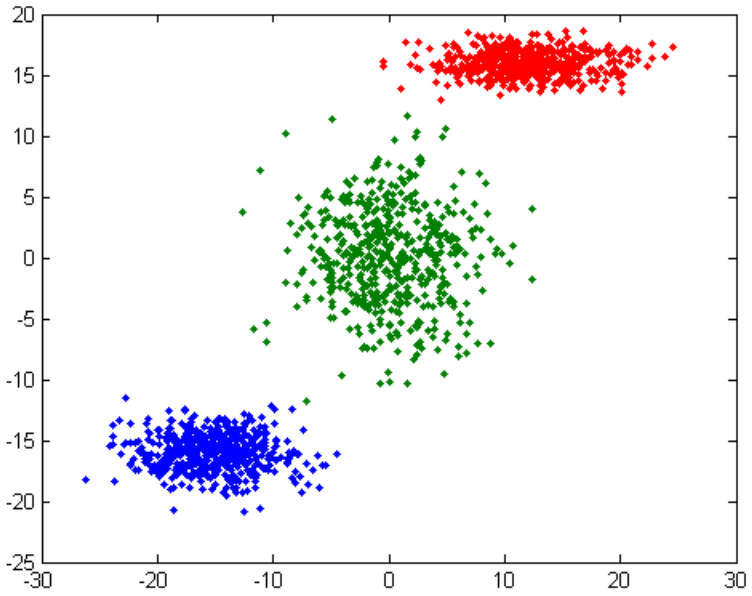

Figure 27: Izlaz ff mreze za iste ulazne podatke

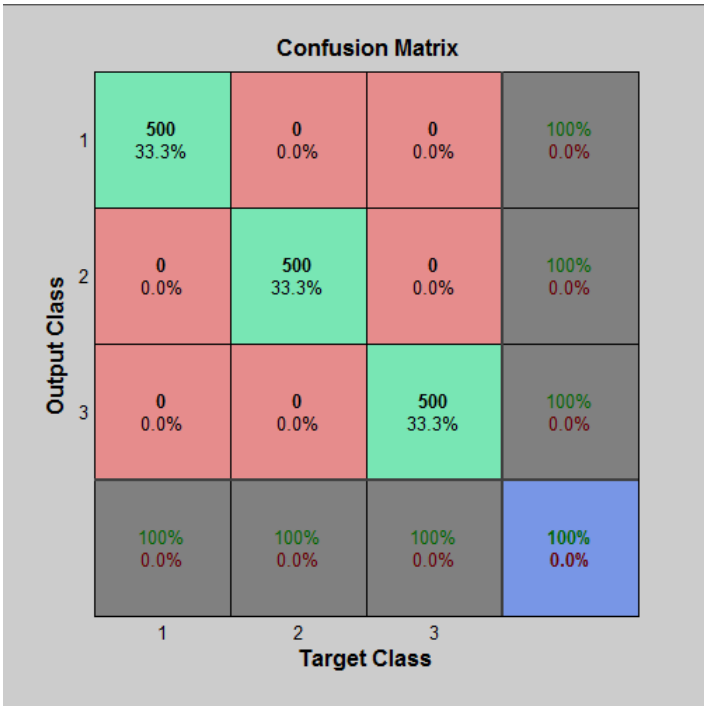

Figure 28: Confusion matrix

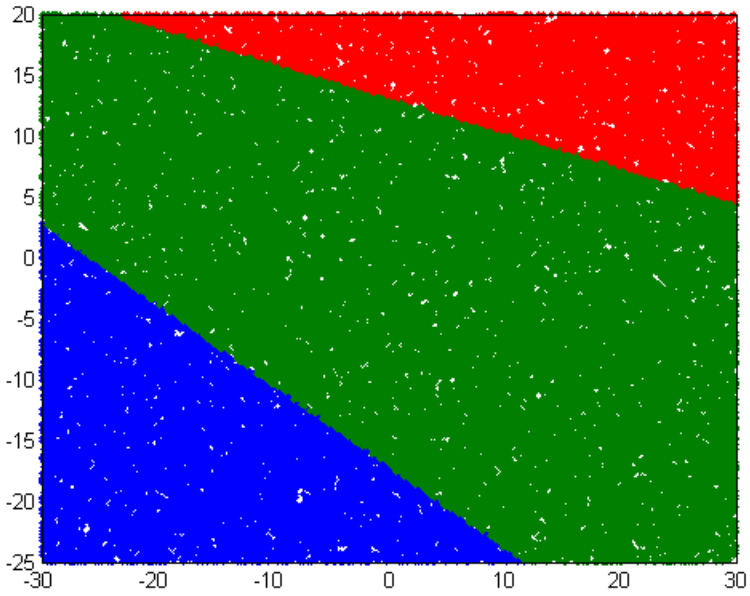

Figure 29: Izlaz ff mreze na celom opsegu

(h) Feedforward 4 sa ranim zaustavljanjem:

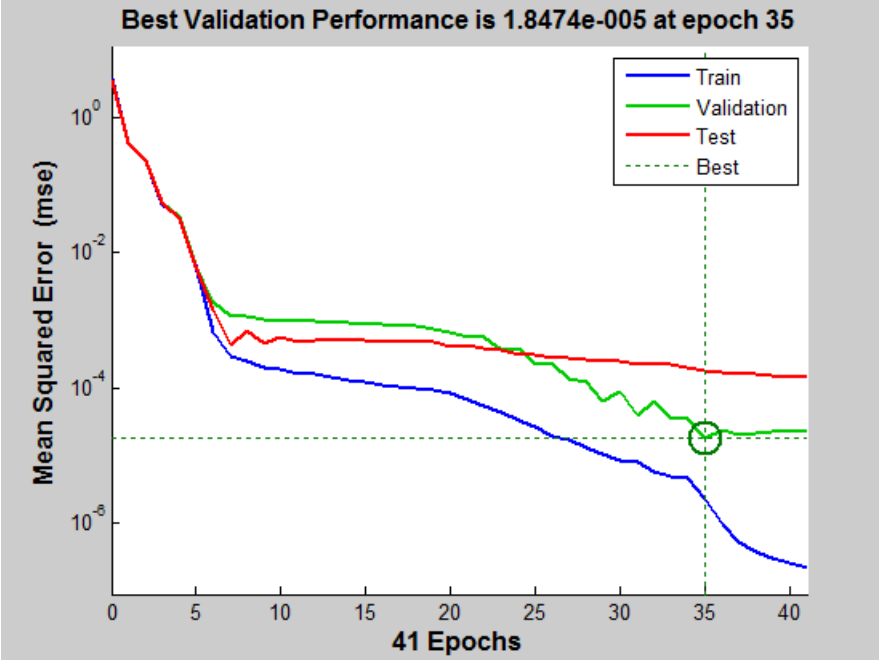

Figure 30: Performanse treniranja ff mreze sa ranim zaustavljanjem

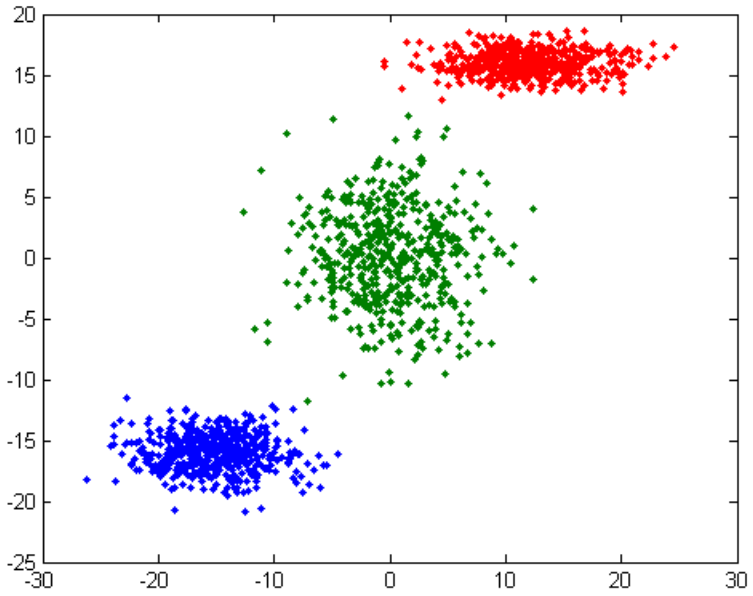

Figure 31: Izlaz ff mreze za iste ulazne podatke

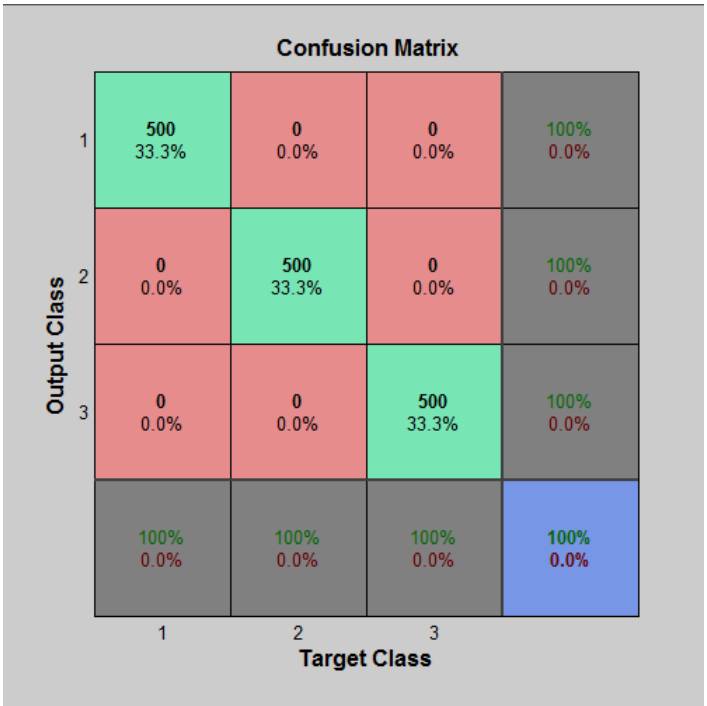

Figure 32: Confusion matrix

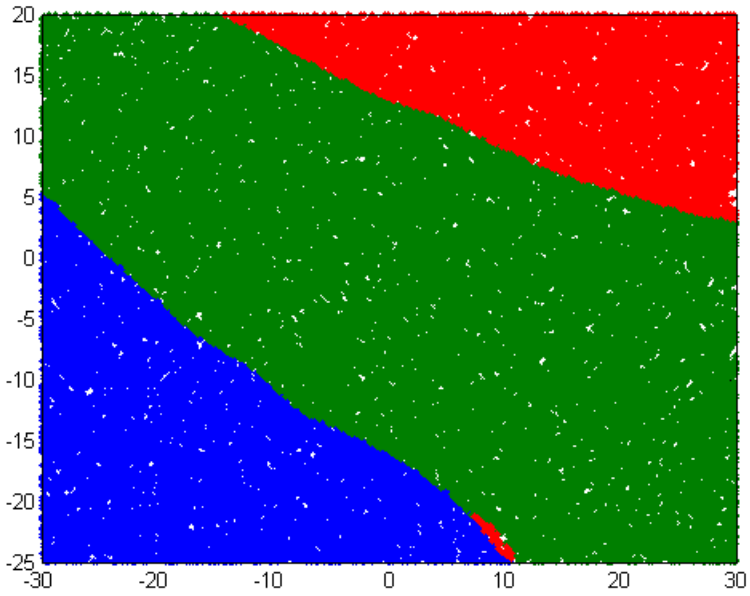

Figure 33: Izlaz ff mreze na celom opsegu

(i) Feedforward 4 bez ranog zaustavljanja:

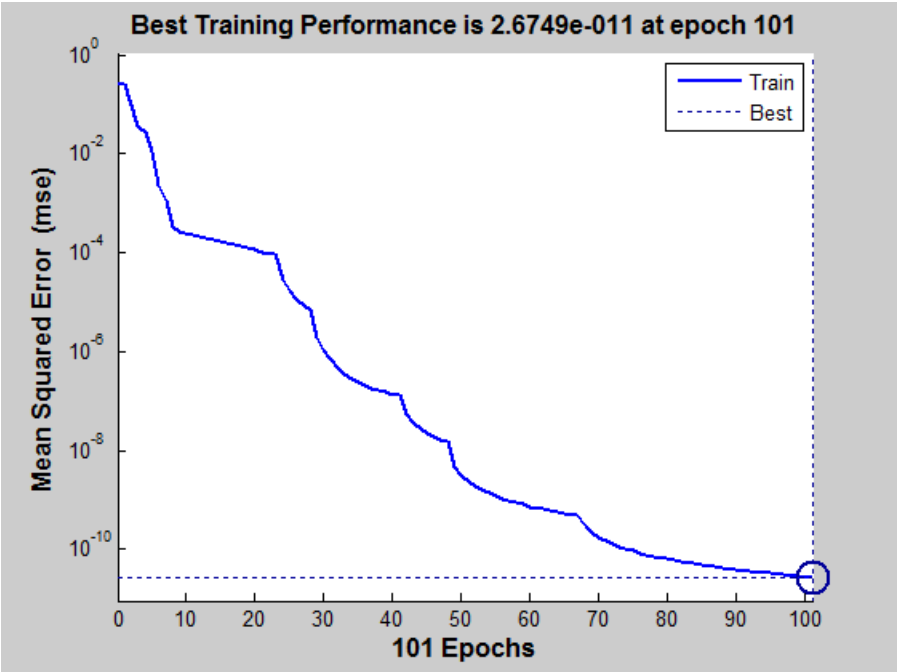

Figure 34: Performanse treniranja ff mreze sa ranim zaustavljanjem

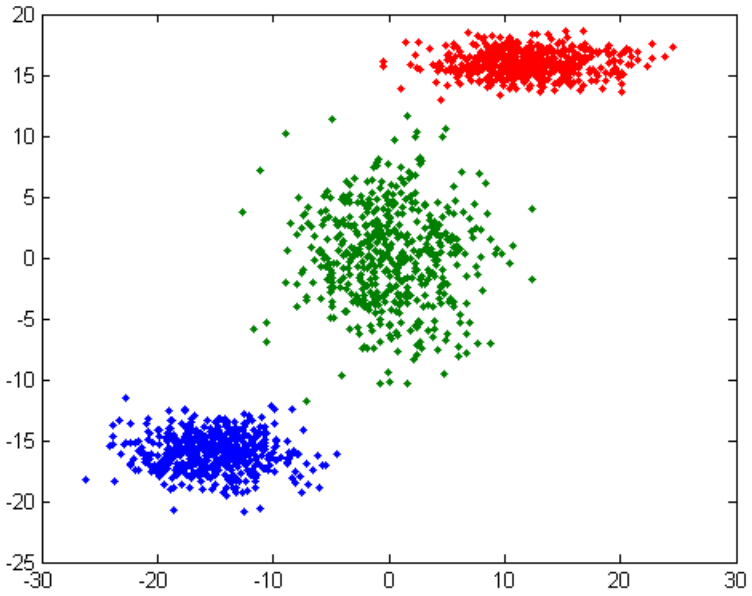

Figure 35: Izlaz ff mreze za iste ulazne podatke

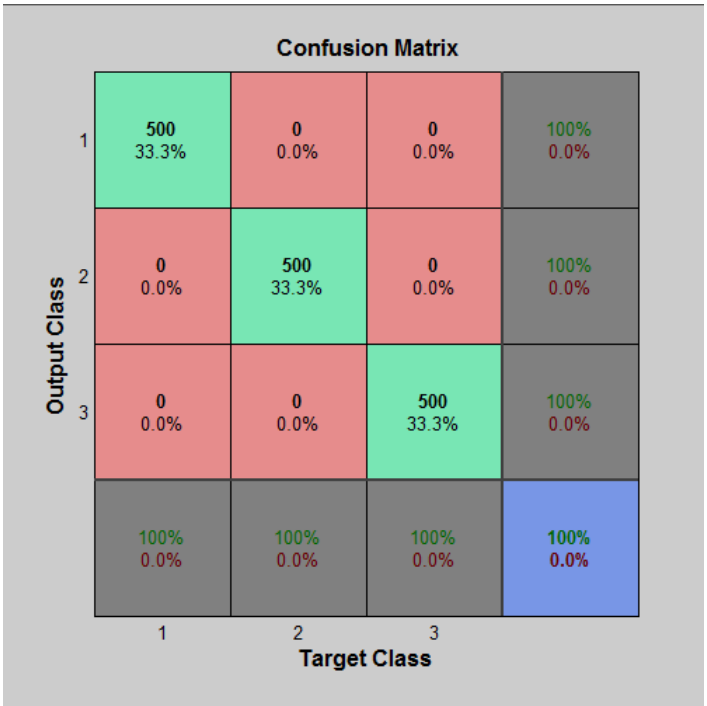

Figure 36: Confusion matrix

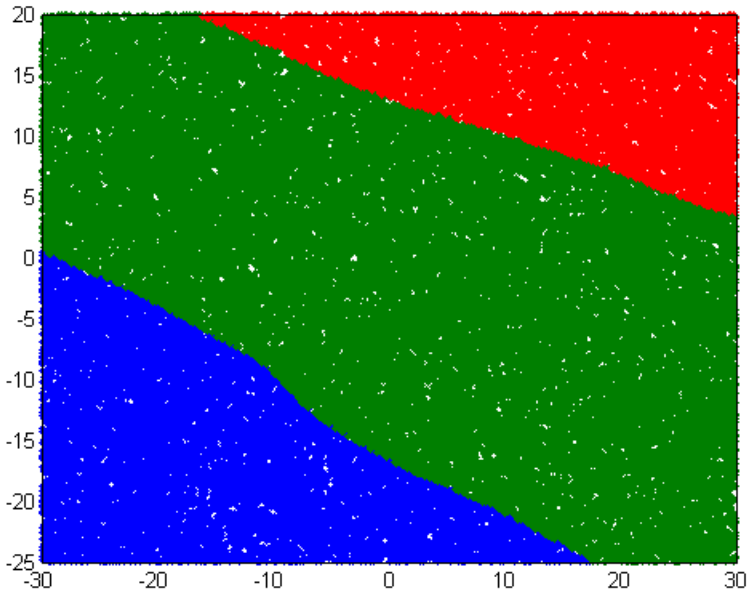

Figure 37: Izlaz ff mreze na celom opsegu

2. Podaci B1:

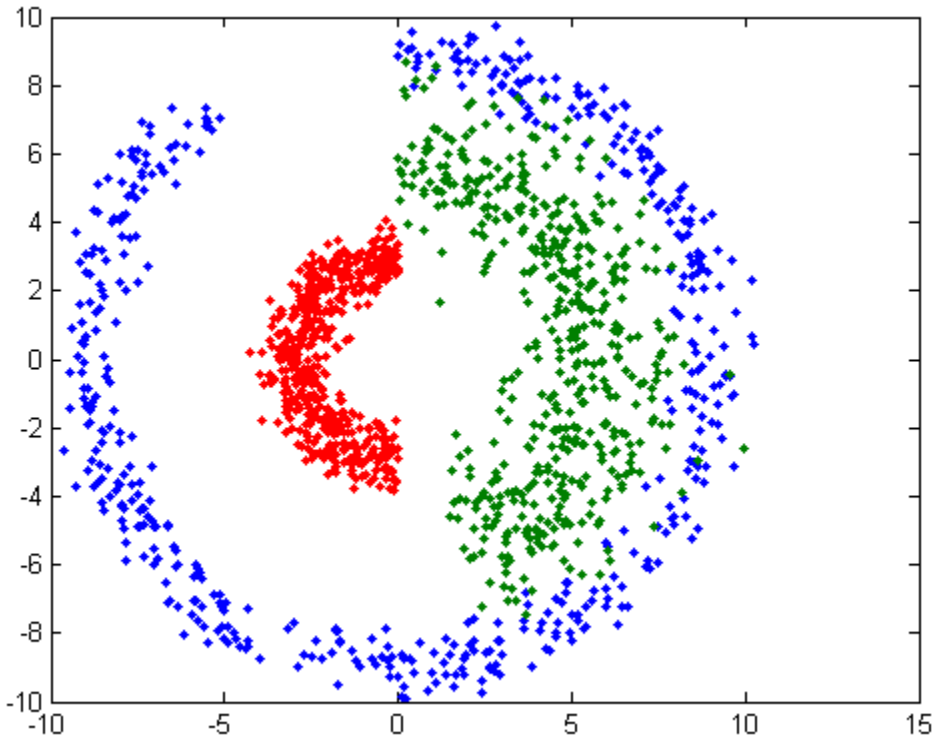

Figure 38: Podaci B1

(a) Perceptron:

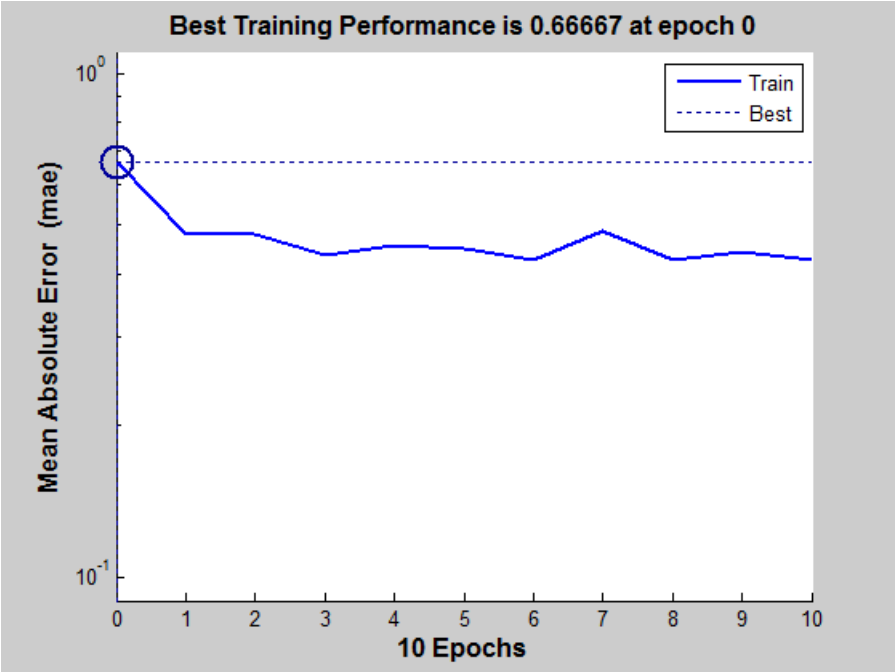

Figure 39: Performanse treniranja perceptrona

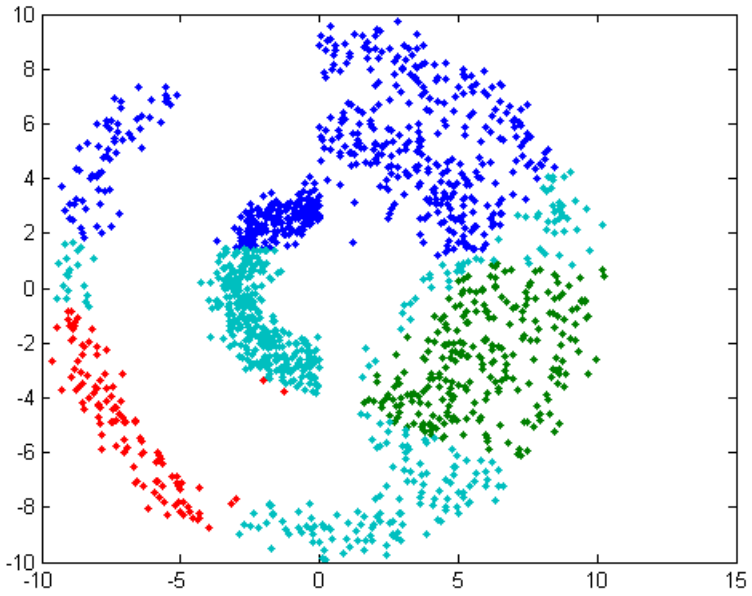

Figure 40: Izlaz perceptrona za iste ulazne podatke

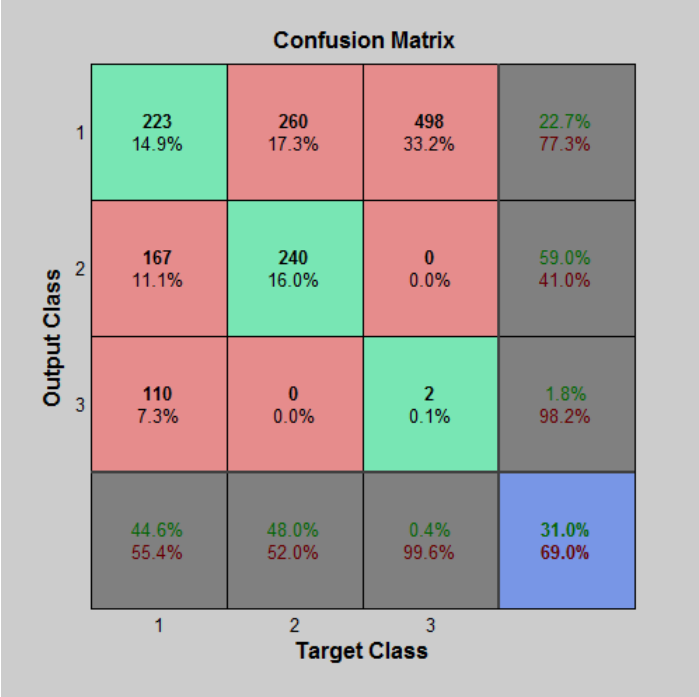

Figure 41: Confussion matrix

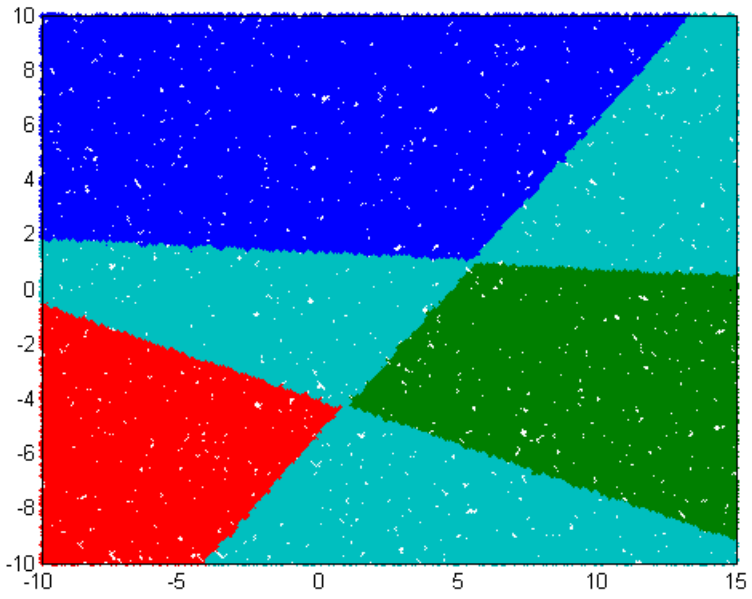

Figure 42: Izlaz perceptrona na celom opsegu

(b) Feedforward 1 sa ranim zaustavljanjem:

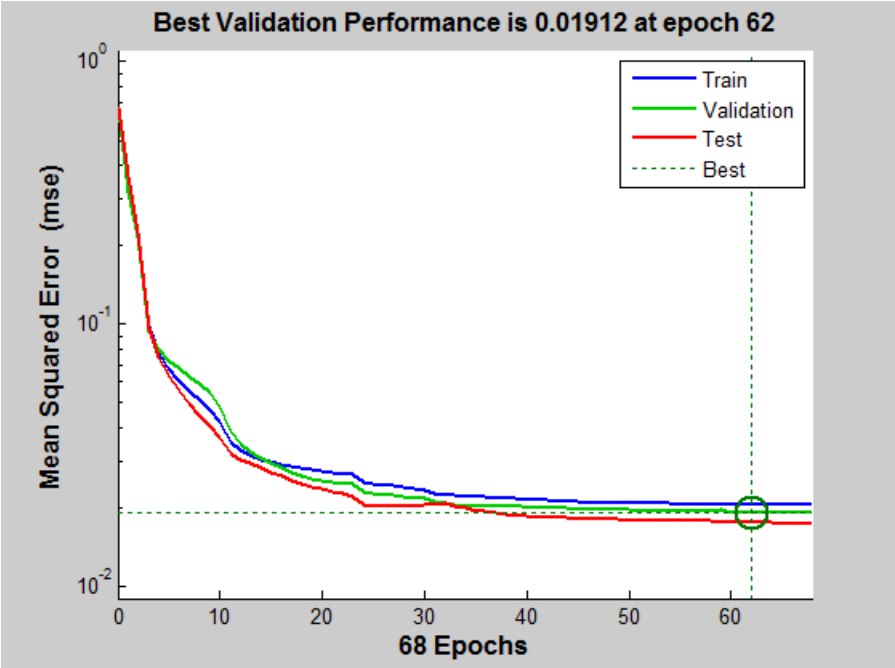

Figure 43: Performanse treniranja ff mreze sa ranim zaustavljanjem

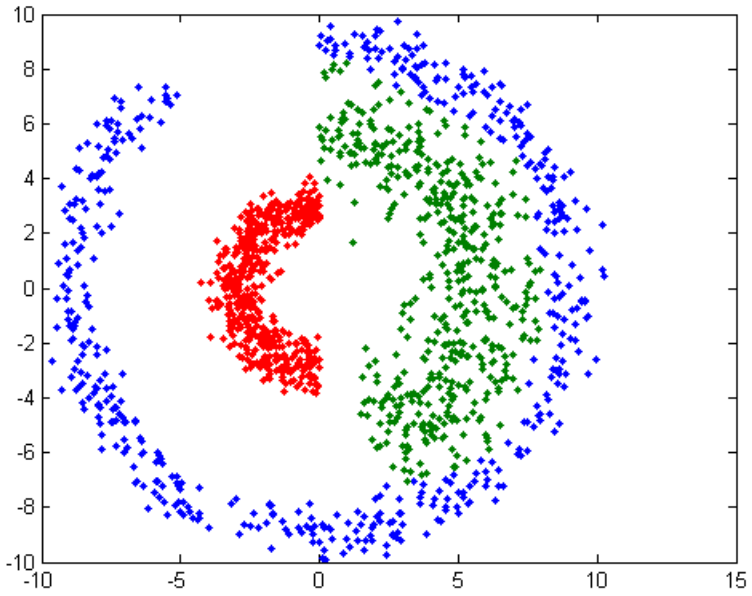

Figure 44: Izlaz ff mreze za iste ulazne podatke

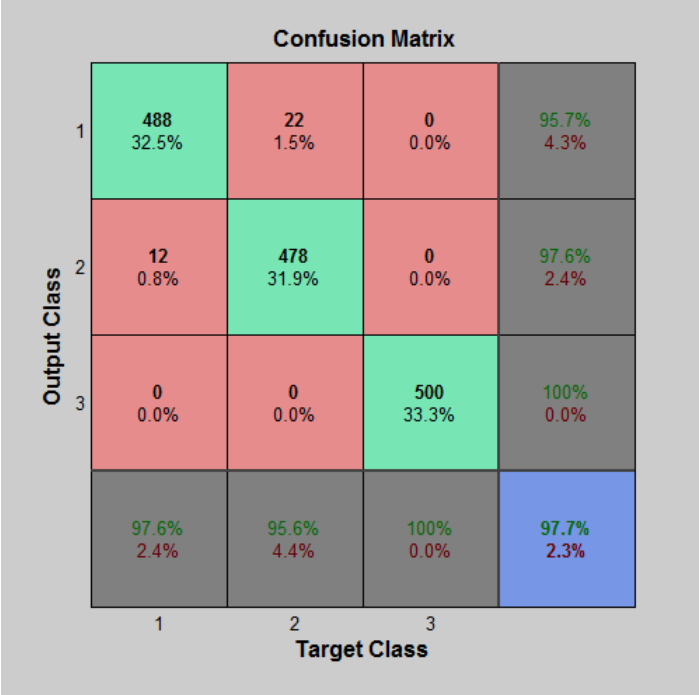

Figure 45: Confusion matrix

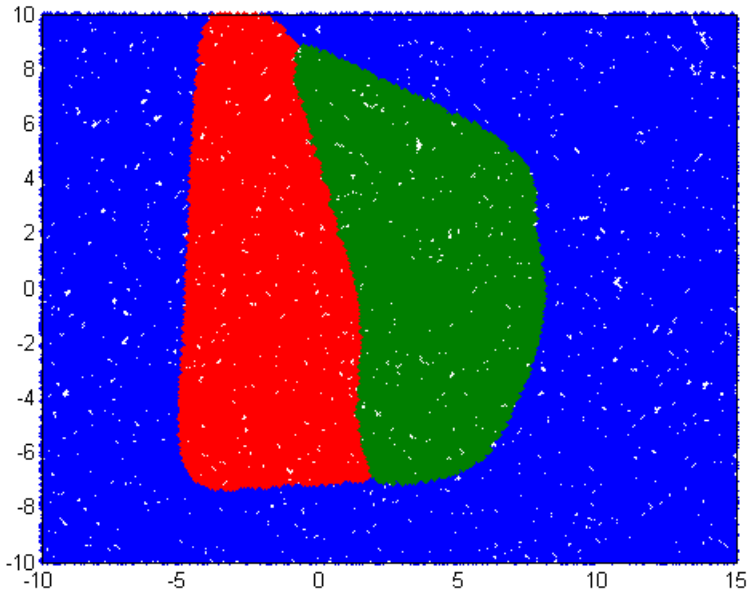

Figure 46: Izlaz ff mreze na celom opsegu

(c) Feedforward 1 bez ranog zaustavljanja:

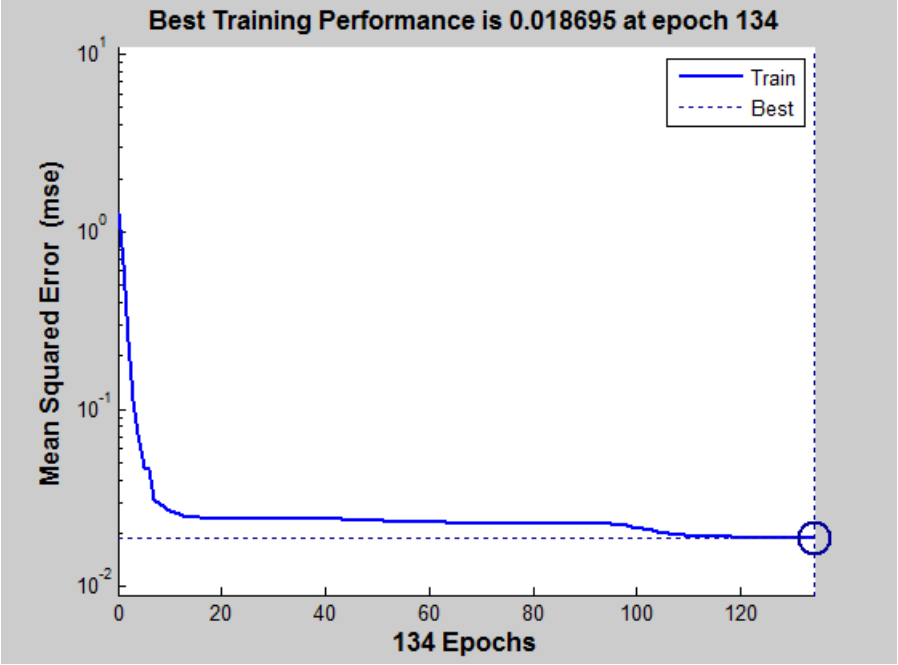

Figure 47: Performanse treniranja ff mreze sa ranim zaustavljanjem

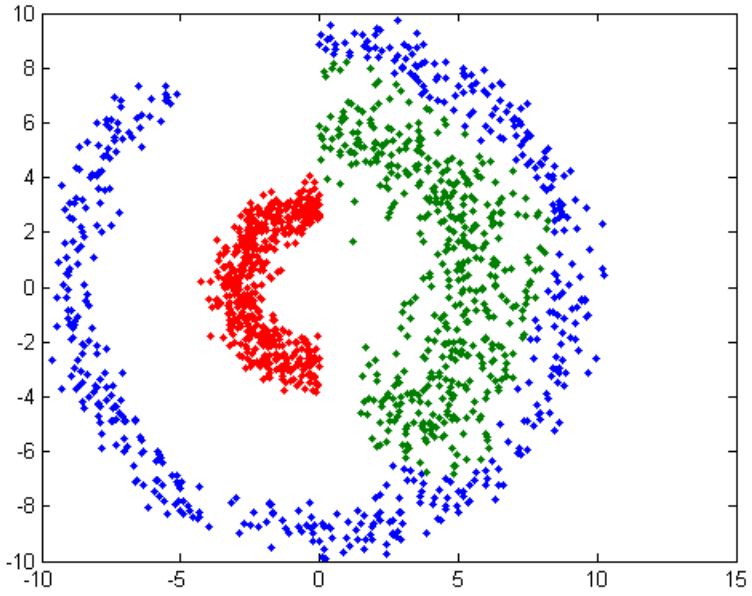

Figure 48: Izlaz ff mreze za iste ulazne podatke

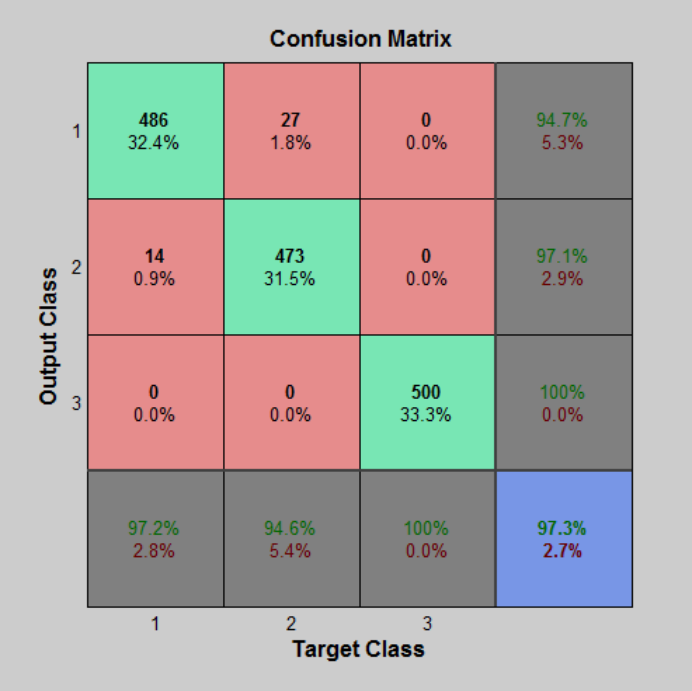

Figure 49: Confusion matrix

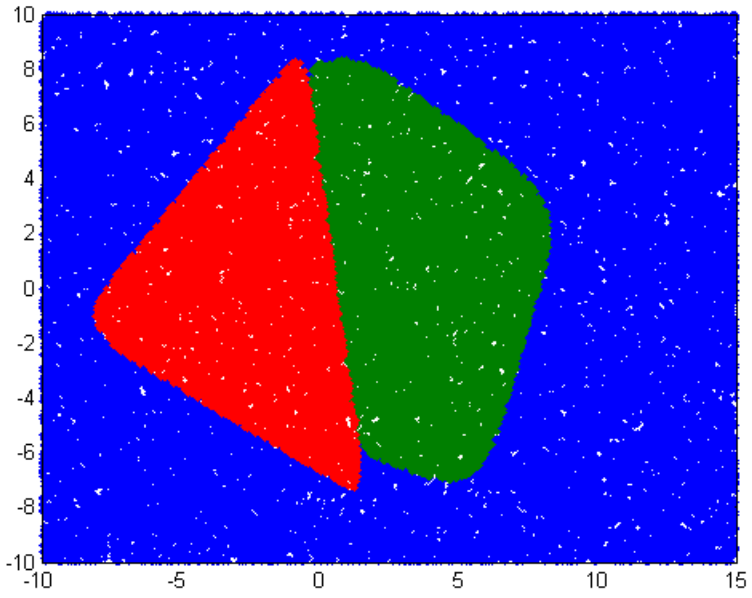

Figure 50: Izlaz ff mreze na celom opsegu

(d) Feedforward 2 sa ranim zaustavljanjem:

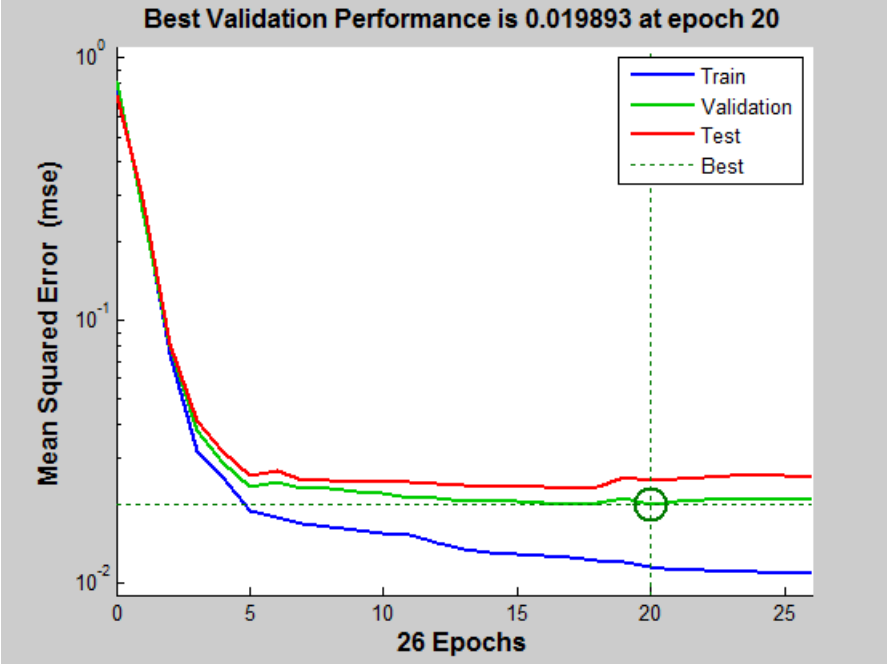

Figure 51: Performanse treniranja ff mreze sa ranim zaustavljanjem

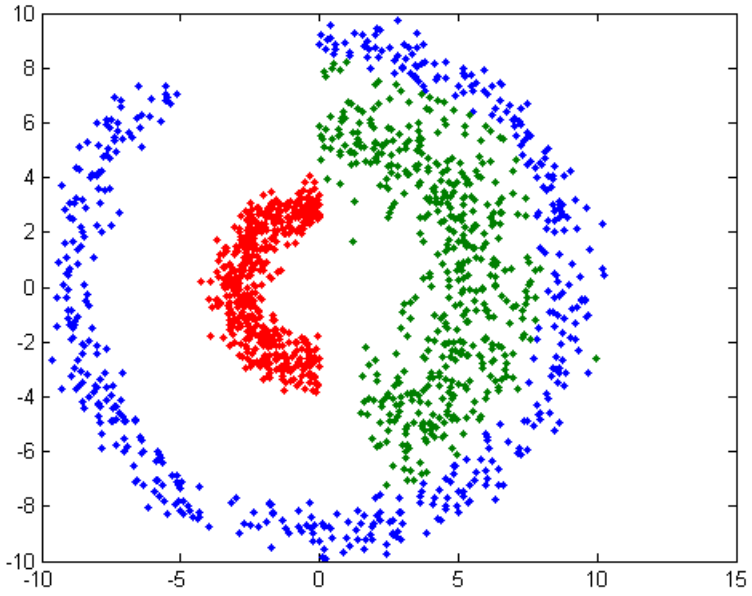

Figure 52: Izlaz ff mreze za iste ulazne podatke

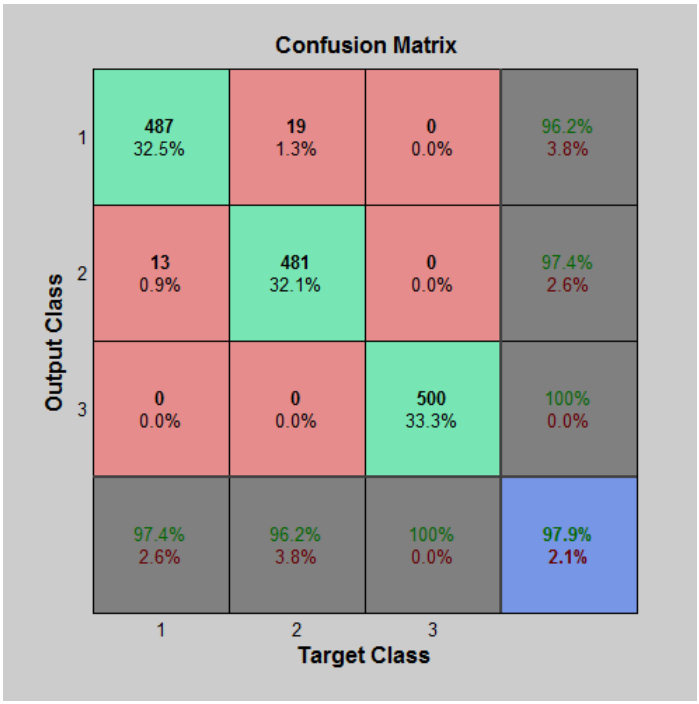

Figure 53: Confusion matrix

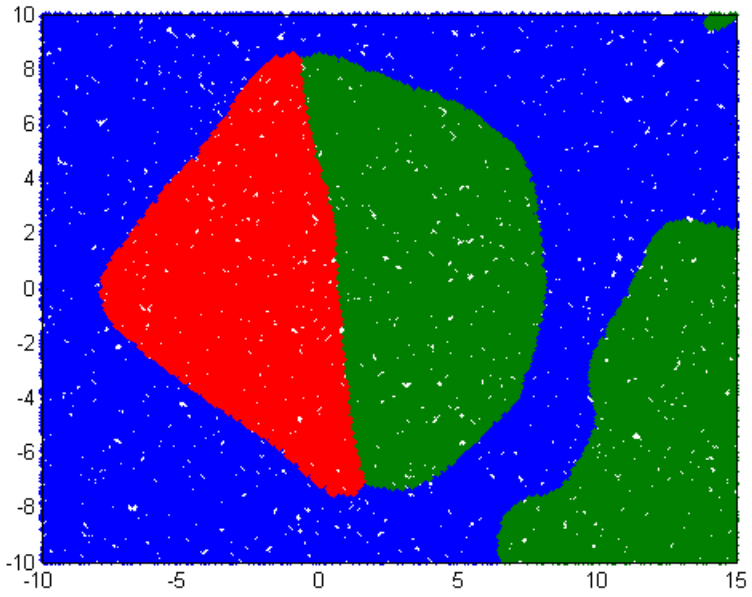

Figure 54: Izlaz ff mreze na celom opsegu

(e) Feedforward 2 bez ranog zaustavljanja:

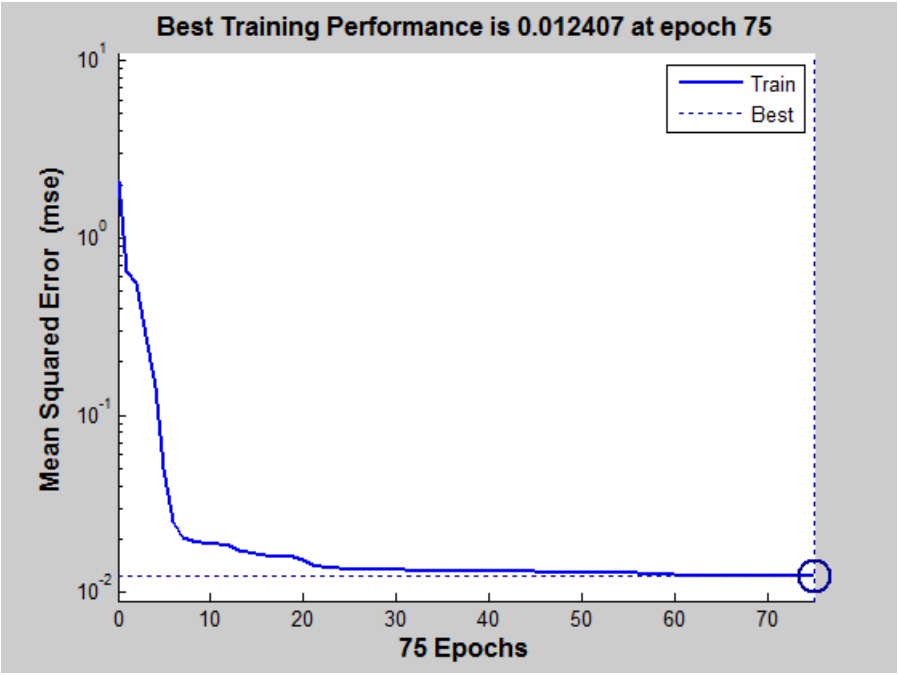

Figure 55: Performanse treniranja ff mreze sa ranim zaustavljanjem

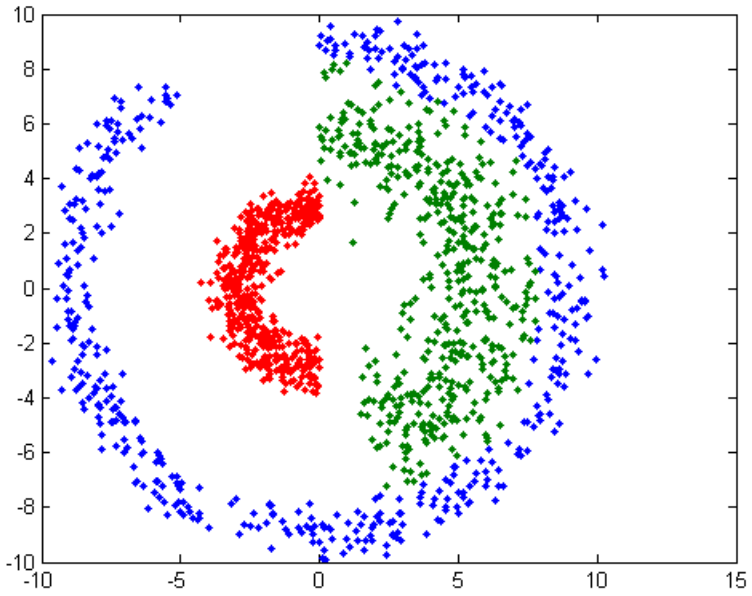

Figure 56: Izlaz ff mreze za iste ulazne podatke

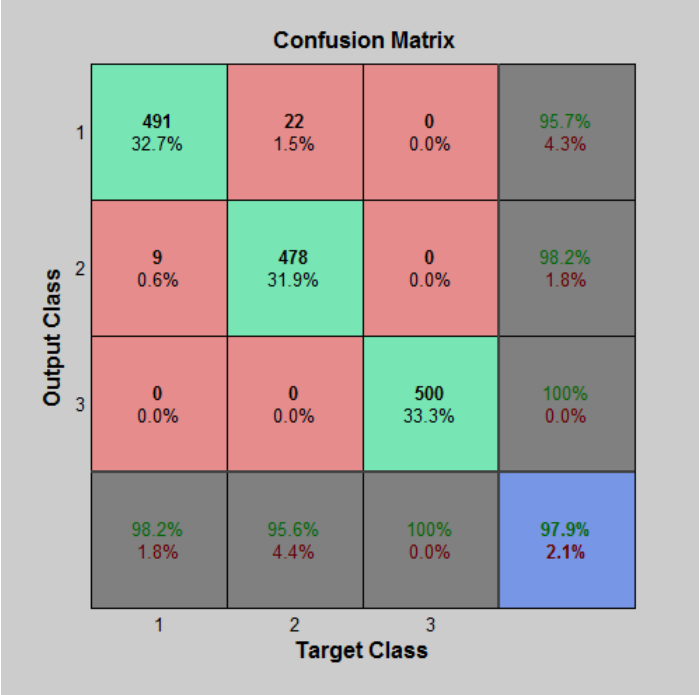

Figure 57: Confusion matrix

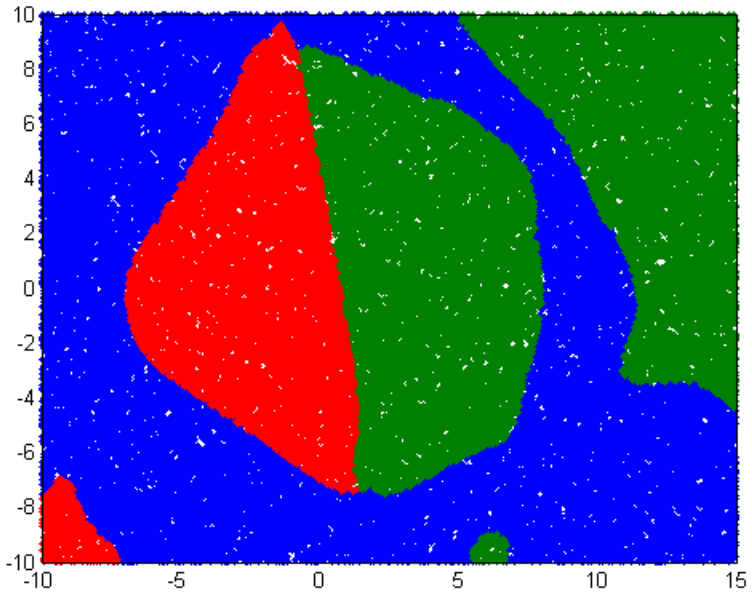

Figure 58: Izlaz ff mreze na celom opsegu

(f) Feedforward 3 sa ranim zaustavljanjem:

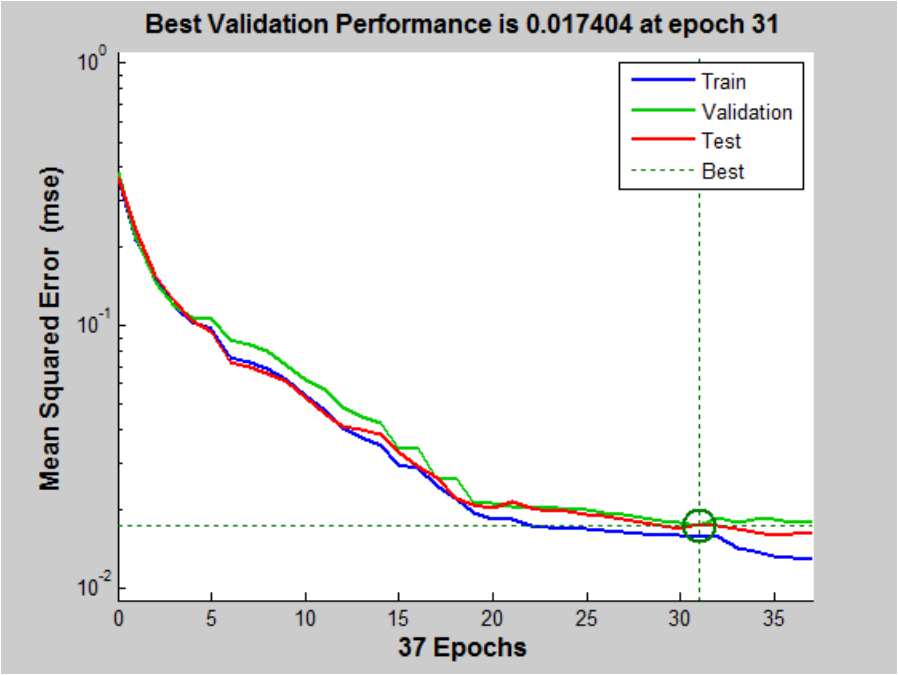

Figure 59: Performanse treniranja ff mreze sa ranim zaustavljanjem

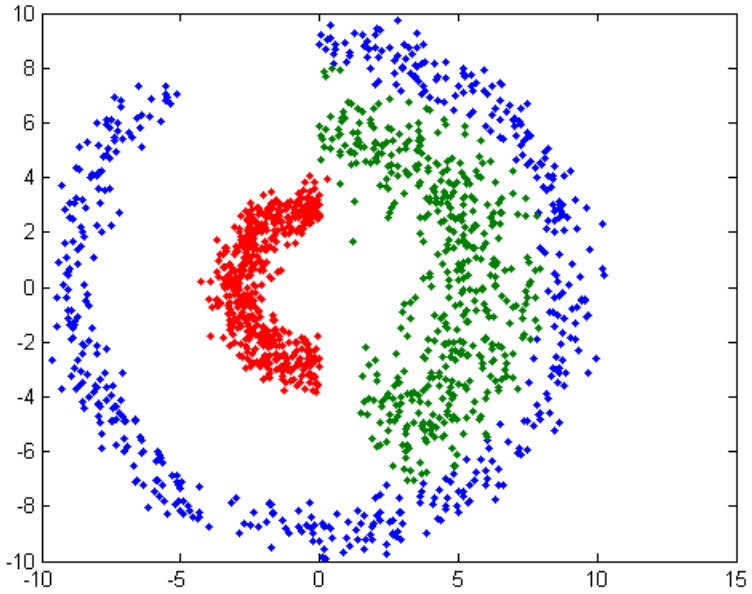

Figure 60: Izlaz ff mreze za iste ulazne podatke

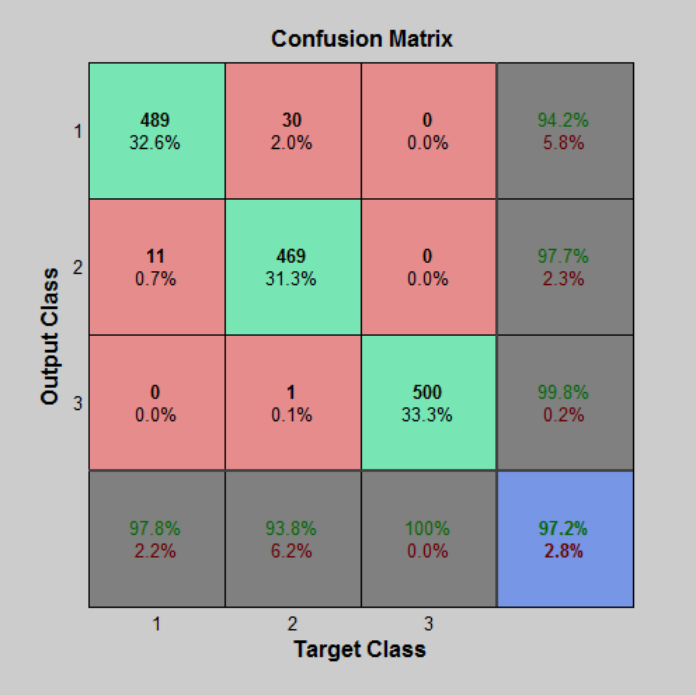

Figure 61: Confusion matrix

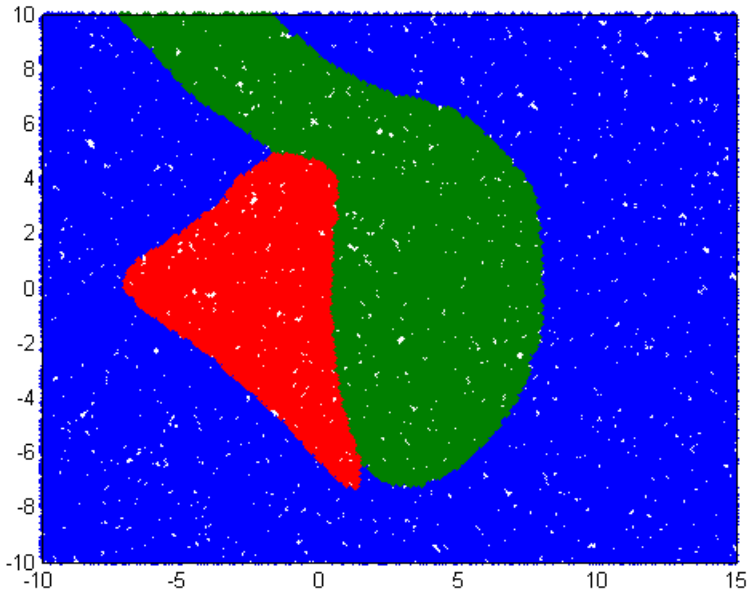

Figure 62: Izlaz ff mreze na celom opsegu

(g) Feedforward 3 bez ranog zaustavljanja:

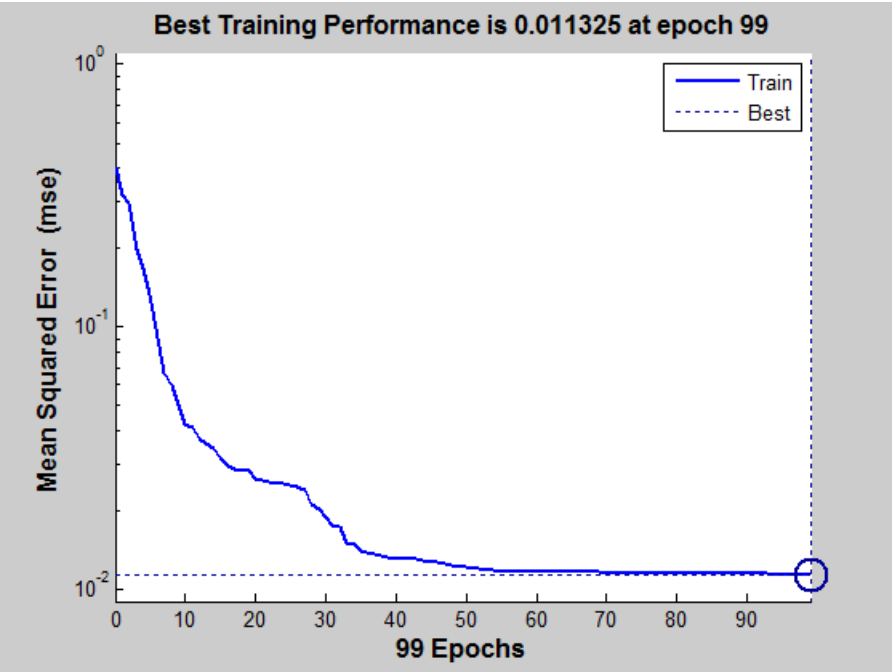

Figure 63: Performanse treniranja ff mreze sa ranim zaustavljanjem

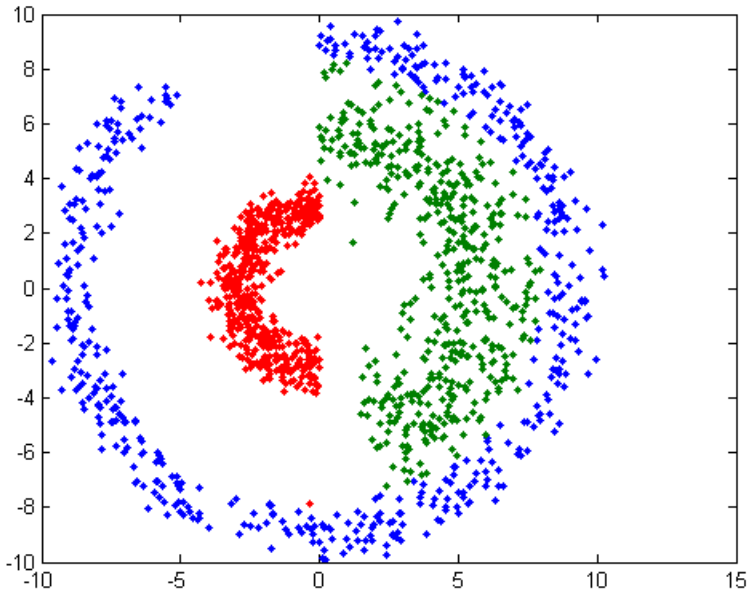

Figure 64: Izlaz ff mreze za iste ulazne podatke

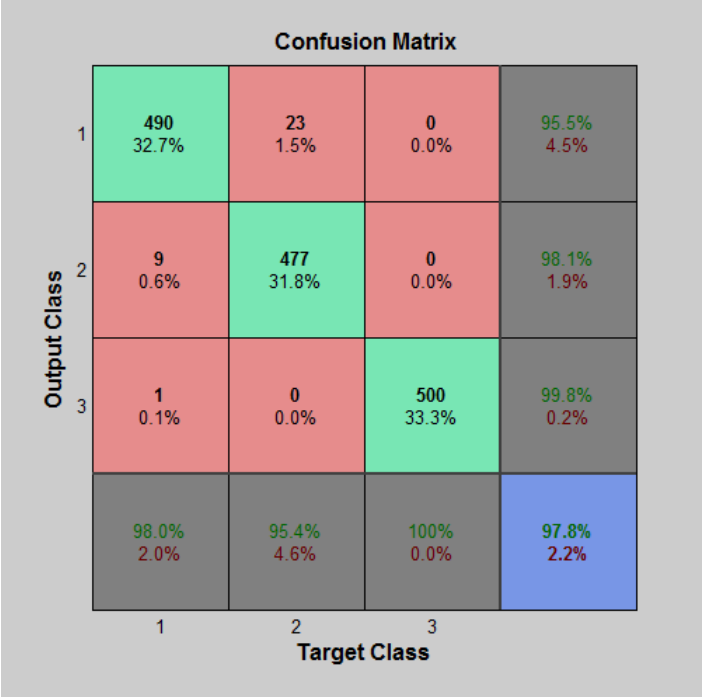

Figure 65: Confusion matrix

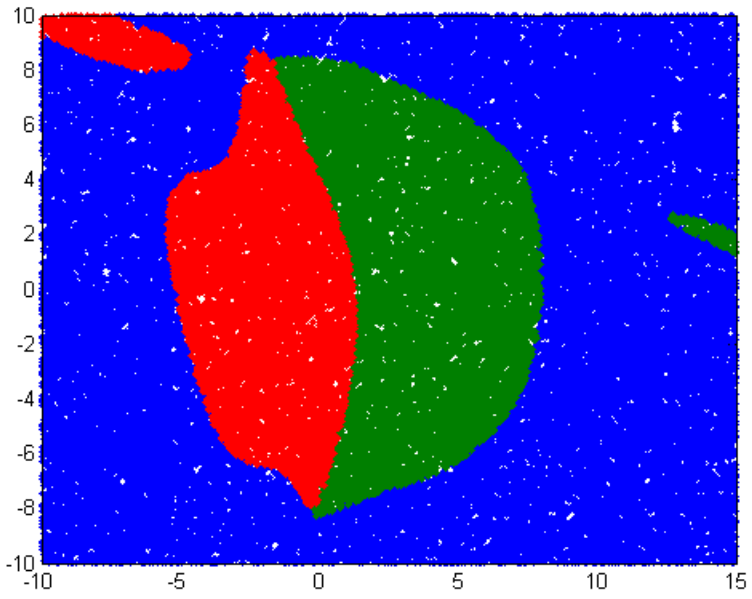

Figure 66: Izlaz ff mreze na celom opsegu

(h) Feedforward 4 sa ranim zaustavljanjem:

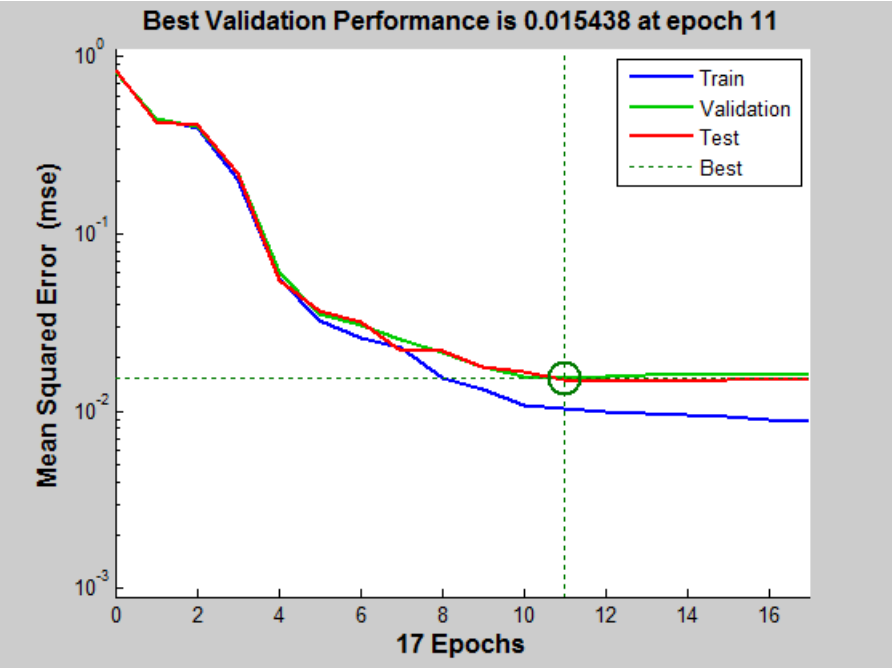

Figure 67: Performanse treniranja ff mreze sa ranim zaustavljanjem

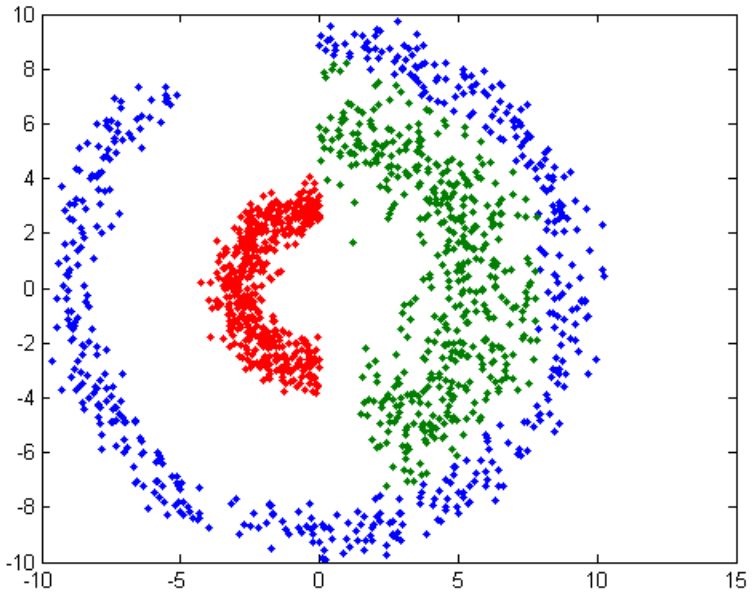

Figure 68: Izlaz ff mreze za iste ulazne podatke

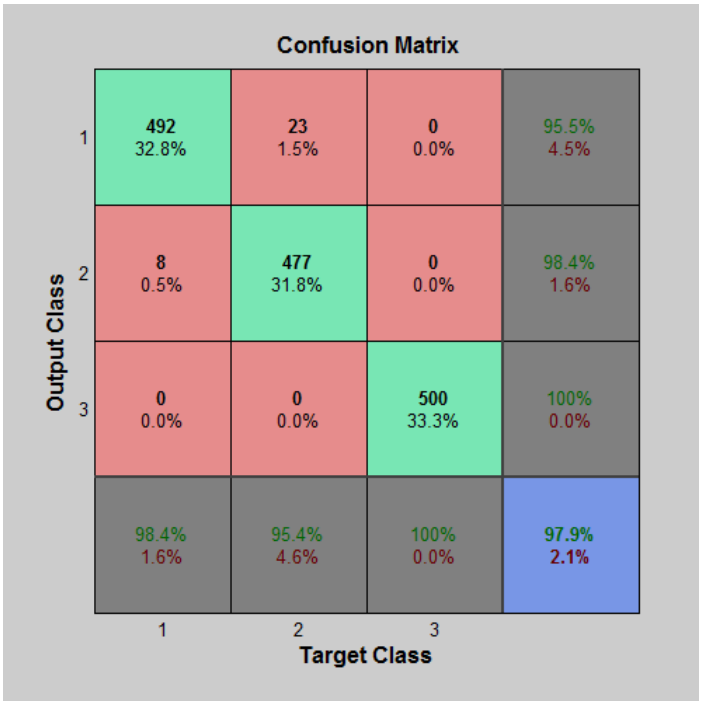

Figure 69: Confusion matrix

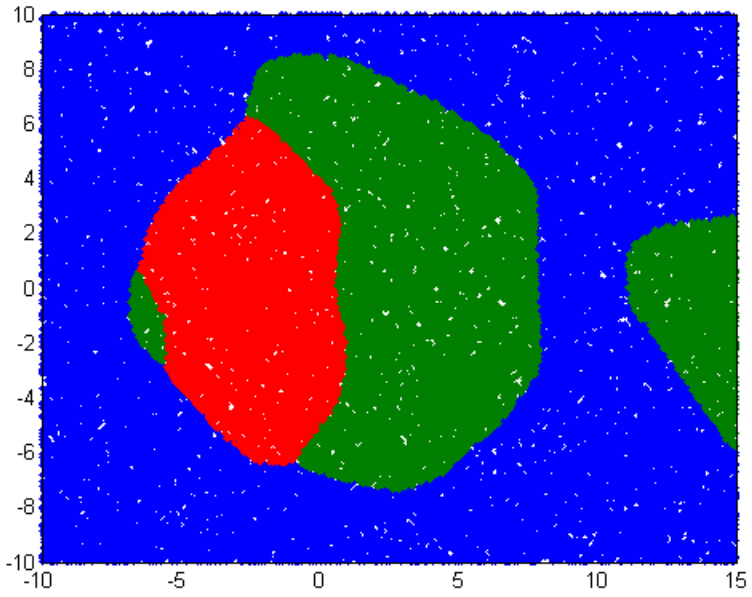

Figure 70: Izlaz ff mreze na celom opsegu

(i) Feedforward 4 bez ranog zaustavljanja:

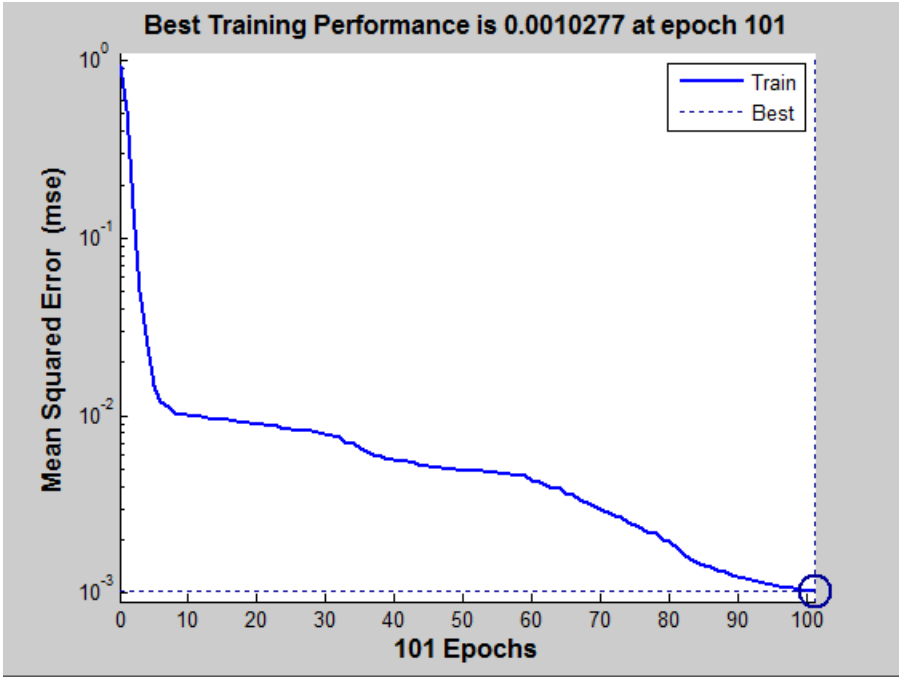

Figure 71: Performanse treniranja ff mreze sa ranim zaustavljanjem

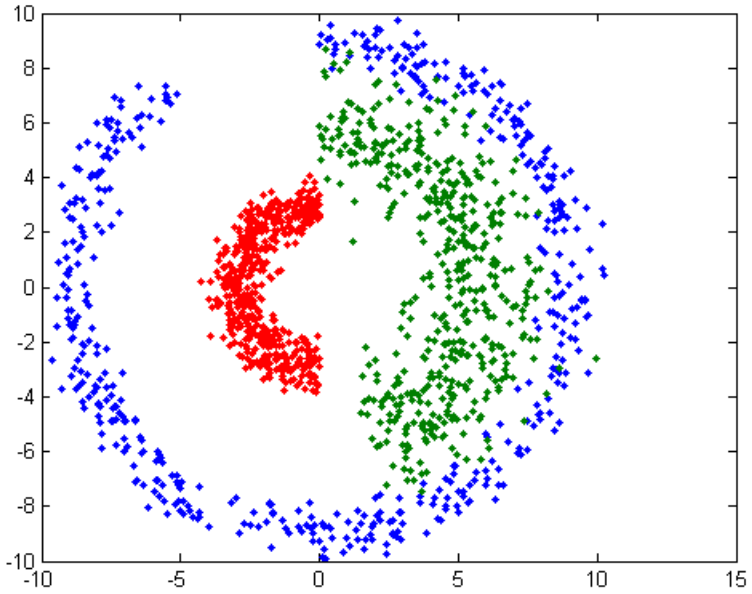

Figure 72: Izlaz ff mreze za iste ulazne podatke

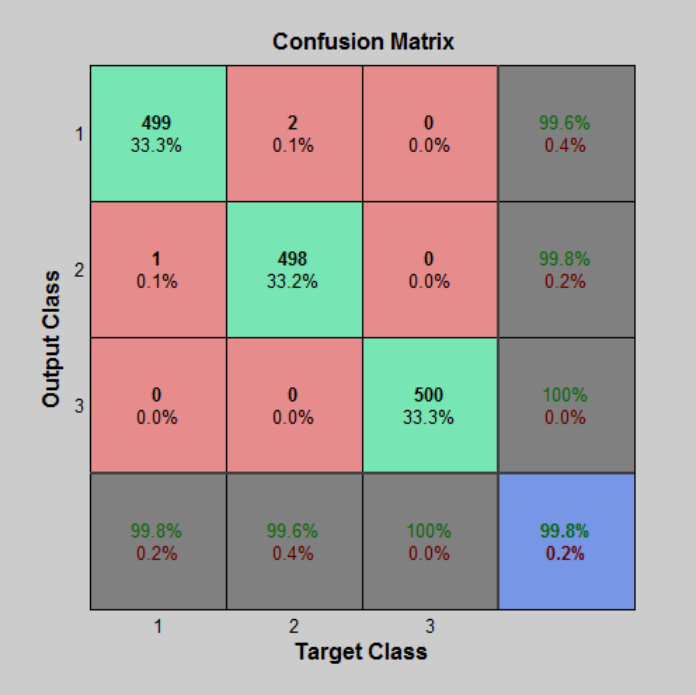

Figure 73: Confusion matrix

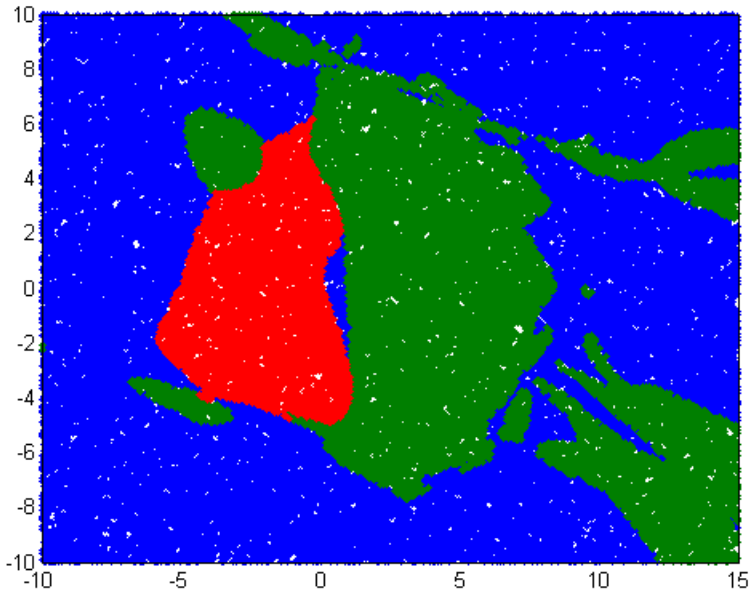

Figure 74: Izlaz ff mreze na celom opsegu