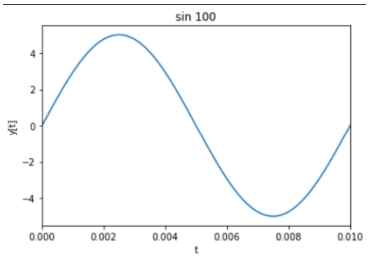
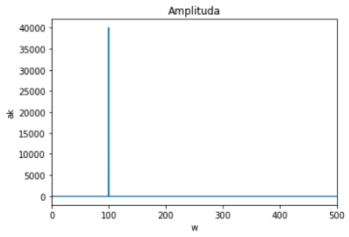
SIGNALI I SISTEMI

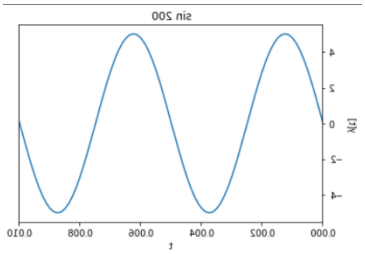
LJUBICA MURAVLJOV
2020/0071

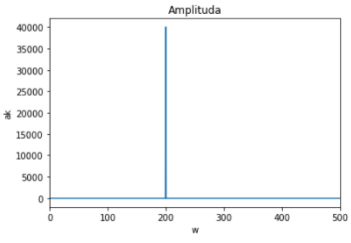
Zadatak 1.

a)



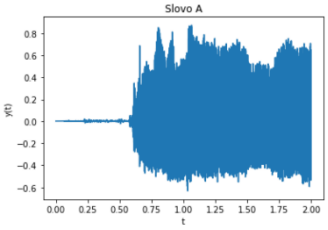


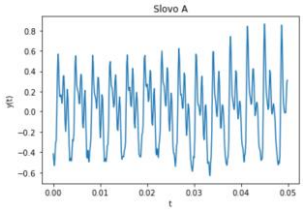




Veca fundamentalna ucestanost proizvodi visi zvuk.

b)





Iz uvelicane slike mozemo primetiti da je

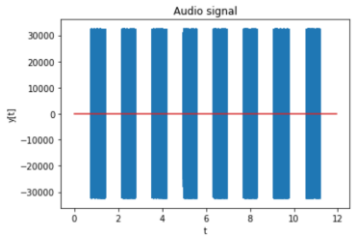
T≈0.01/3 ≈0.0033

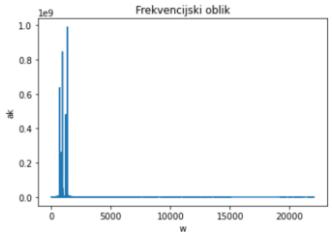
->ω≈2π/T ≈ 1884

ω se ne moze odrediti iz frekvencijskog domena.

Zadatak 2.

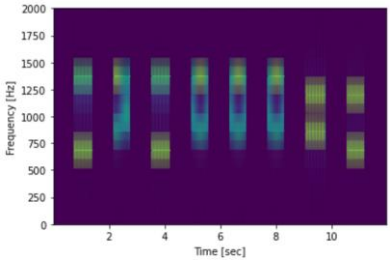
a)





Ne moze se mnogo zakljuciti iz ova dva signala. Za to nam sluzi spectrogram:

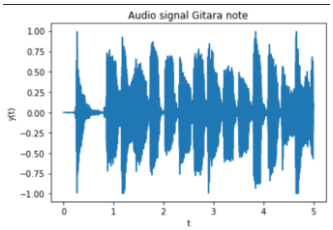
b) I c)

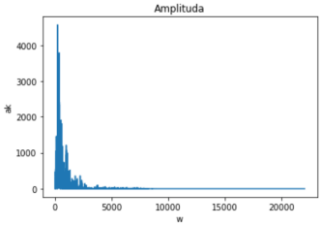


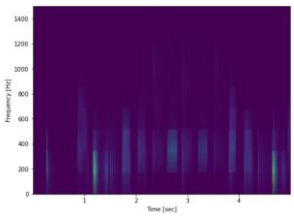
Iz spektrograma mozemo primetiti kojim frekvencijama je u kom trenutku definisan signal.
Posto imamo tabelu kojim frekvencijama je definisan koji broj, mi mozemo odavde desifrovati pocetni signal.

Ovde su u pitanju cifre 20200071

d)



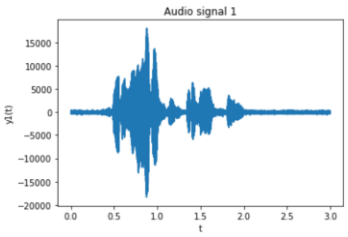


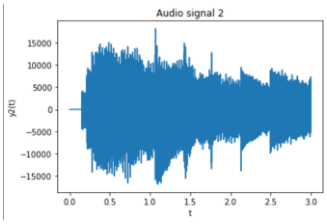


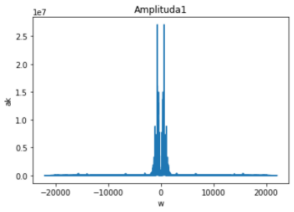
Uzeta je ucestanost 44100 zato sto je u pitanju muzicki instrument I da bi zvuk bio cistiji.

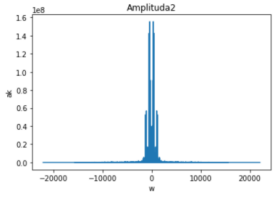
Na spektrogramu mozemo videte odvojene uske pravougaonike, svaki odgovara jednom tonu. Mozemo citati njihove frekvencije I tako zakljuciti koje note su odsvirane.

Zadatak 3.

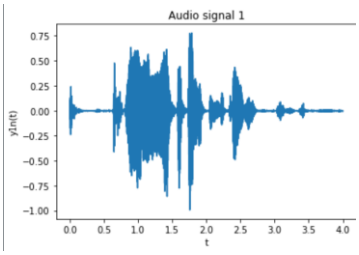


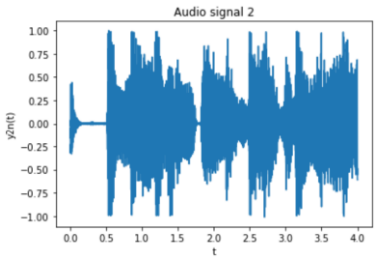




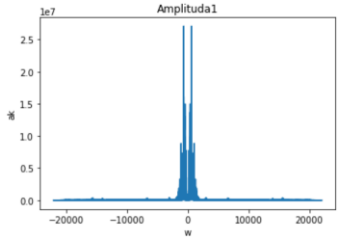


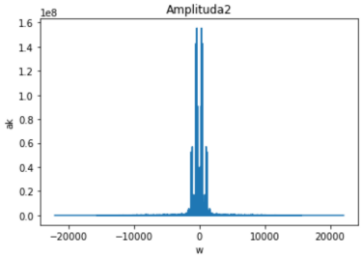
NP1:





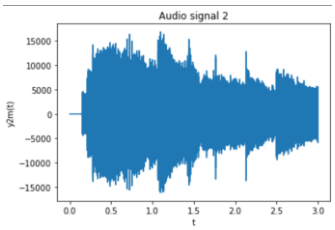
Vremenski oblici izgledaju isto.



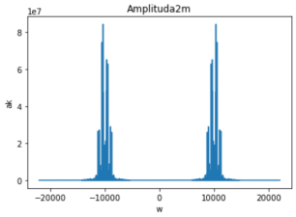


Frekvencijski takodje.

Modulacija y2:



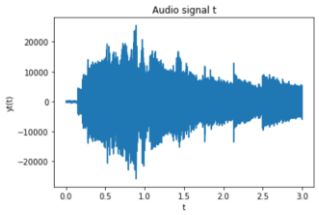
Vremenski oblik izgleda isto.



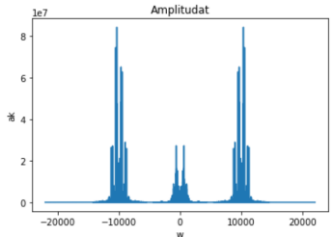
Frekvencijski se duplirao I razdvojio. Ovim pravimo mesta da ubacimo y1n izmedju. Takodje su amplitude duplo manje (posledica modulacije)

Sada se vise ne cuje zvuk koji je bio, vec samo pistanje.

Sabiranje:



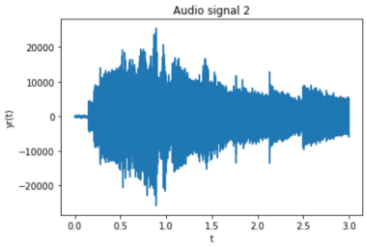
Vremenski oblik se promenio I sada je zbir dva prethodna vremenska oblika.

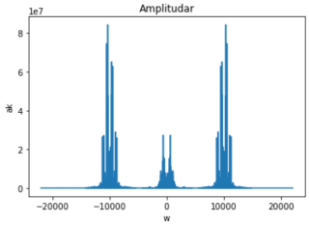


Samo su sabrane 2 f-je (dodalo se y1n u proctor izmedju y2m)

Zvuk koji se cuje je originalan y1, sa pistanjem u pozadini.

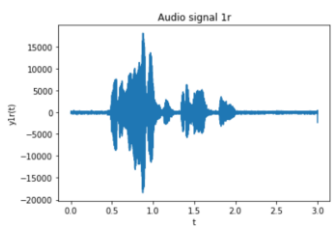
Kanal veze:



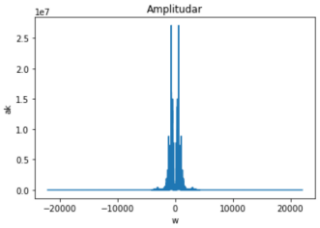


Sve ostaje nepromenjeno.

NF:



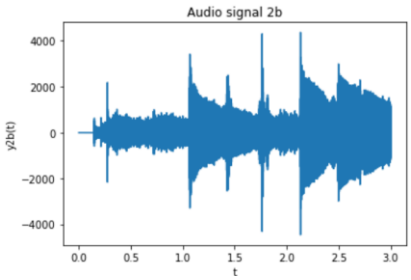
Ponovo dobijamo originalan y1.

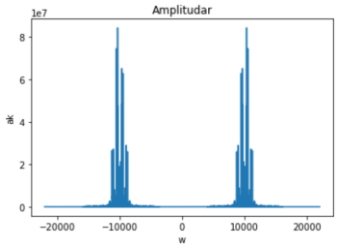


Izdvojen je I njegov frekvencijski deo, isti kao originalan.

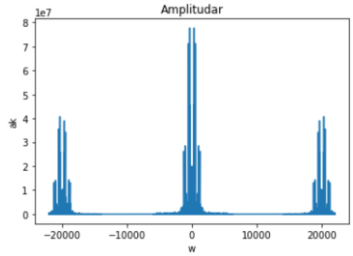
Zvuci isto kao originalan signal.

PO:





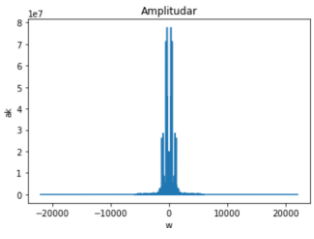
Demodulacija:



Sada nam se u sredini ponovo pojavi originalni deo frekvencijskog signala koji cemo pustiti kros NF I izolovati.

Tako ponovo dobijamo originalni y2.

NF:



Vremenski grafik izgleda isto kao original, I zvuci kao sto je zvucao na pocetku.