**DAILY ASSESSMENT FORMAT**

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| **Date:** | **25/5/2020** | | **Name:** | **Abhishek Vasudev Mahendrakar** | | |
| **Course:** | **TCS ION** | | **USN:** | **4AL17EC003** | | |
| **Topic:** | **Introduction to Fourier**  **Series, Fourier transform, Hilbert**  **Transform, Fourier Series Using**  **Matlab** | | **Semester & Section:** | **6th-‘A’** | | |
| **GitHub Repository:** | **ECEAbhishekVMahendrakar** | | **E-mail:** | **abhi2244mahendrakar@gmail.com** | | |
| **FORENOON SESSION DETAILS** | | | | | |
| **Image of session** | | | | | |
| **Report – Report can be typed or hand written for up to two pages.**  **Introduction to Fourier Series and Fourier Transform**  **Fourier Series**  (*f x*) = *a* (*a cos*2*kt sin*2*kt*) 2  1  0 + Σ  ∞  −∞  *k* + *b k*  **Fourier Transform**  *X*(*F*) = ∫ (*t*)*e dt*  ∞  −∞  *x* −*j*2*F t*  **Euler's Formula**  *Xk* = Σ  *N*−1  *n*=0  *xn ej*2Π*kn*/*N*  *Xk* = *x*0[*cos*(− *b*0) + *jsin*(− *b*0) + ....  *X K* = *AK* + *BKj*  **Hilbert Transform**  < *f*(*x*), *g*(*x*) >= ∫ (*x*)*g*(*x*) *dx*  *b*  *a*  *f*  , *X* (*x*, )*g*(*x*)Δ*X* < *f g* > Δ = Σ  *n*  *K*=1  *f K*  **Complex Fourier Series**  (*x*) *e f* = Σ  ∞  *k*=−∞  *Ck*  *iKX*  *eiKX* = *cos*(*Kx*) + *isin*(*Kx*)  < φ *j*,φ *k* >= ∫ *e dx dx* [*e* ]  π  −π  *eijk* −*jkX* = ∫  π  −π  *ei*(*j*−*k*)*X* = 1  *i*(*j*−*K*)  *i*(*j*−*K*)*x* π  −π  0 *if j* =/ *k*  2π *if j* = *k*  **Fourrier Series Using Matlab**  **clear all**  **close all**  **clc**  **figure**  **set(gcf,'Position',[1500 200 2000 1200])**  **%define domain**  **L=pi;**  **N=1024;**  **dx=2\*L/(N-1);**  **x=L:dx:L;**  **%Define hat function**  **f=0\*x;**  **f(N/4:N/2)=4\*(1:N/4+1)/N;**  **f(N/2+1:3\*N/4)=1-4\*(0:N/4-1)/N;**  **plot(x,f,'-k','Linewidth',3.5),hold on**  **%compute fourier series**  **CC=jet(20)**  **A0=sum(f.\*ones(size(x)))\*dx/pi;**  **fFs=A0/2;**  **for k=1:20;**  **A(k)=sum(f.\*cos(pi\*k\*x/L))\*dx/pi;**  **B(k)=sum(f.\*sin(pi\*k\*x/L))\*dx/pi;**  **fFs=fFs+A(k)\*cos(k\*pi\*x/L)+B(k)\*sin(k\*pi\*x/L);**  **plot(x,fFs,'-','color',CC(k,:),'Linewidth',2)**  **pause(.1)**  **end**  **%% plot amplitudes**  **figure;**  **set(gcf,'Position',[1500 200 2000 1200])**  **clear ERR**  **clear A**  **fFs=A0/2;**  **A(1)=A0/2/pi;**  **ERR(1)=norm(f-fFs);**  **kmax=100;**  **for k=1:kmax**  **A(k+1)=sum(f.\*cos(pi\*k\*x/L))\*dx;**  **B(k+1)=sum(f.\*sin(pi\*k\*x/L))\*dx;**  **fFs=fFs+A(k+1)\*cos(k\*pi\*x/L)+B(k+1)\*sin(k\*pi\*x/L);**  **ERR(k+1)=norm(f-fFs)/norm(f);**  **end**  **thresh=median(ERR)\*sqrt(kmax)\*4/sqrt(3);**  **r=max(find(ERR>thresh));**  **r=7;**  **subplot(2,1,1)**  **semilogy(0:1:kmax,A,'k','linewidth',1.5)**  **hold on**  **semilogy(r,A(r+1),'co','Linewidth',15,'MarkerFaceColor','c')**  **xlim([0 kmax])**  **xlim([10^(-7) 1])**  **ylabel('Mode Amplitude','FonSize',16)**  **subplot(2,1,2)**  **semilogy(0:1:kmax,ERR,'k','Linewidth',1.5)**  **hold on**  **semilogy(r,ERR(r+1),'co','Linewidth',15,'MarkerFaceColor','c')**  **xlabel('Mode Number,k','FontSize',16)**  **ylabel('Reconstruction Error','FontSize',16)**  **Fourier Series and Gibbs Phenomena [Matlab]**  **clear all;**  **close all;**  **l=2\*pi**  **N=1024**  **dx=l/(N-1)**  **x=0:dx:l**  **f=zeros(size(x))**  **f(256:768)=1**  **figure**  **set(gcf,'Position',[1500 200 2000 1000])**  **fFs=zeros(size(x));**  **A0=(1/pi)\*sum(f.\*ones(size(x)))\*dx;**  **for m=1:100**  **fFs=A0/2;**  **for k=1:m**  **Ak=(1/pi)\*sum(f.\*cos(2\*pi\*k\*x/l))\*dx;**  **Bk=(1/pi)\*sum(f.\*sin(2\*pi\*k\*x/l))\*dx;**  **fFs=fFs+Ak\*cos(2\*k\*pi\*x/l)+Bk\*sin(2\*k\*pi\*x/l)**  **end**  **plot(x,f,'k','LineWidth',2)**  **hold on**  **plot(x,fFs,'k','LineWidth',1.5)**  **pause(0.1)**  **end** | | | | | |
| **Date:** | **25/5/2020** | **Name:** | | | **Abhishek Vasudev Mahendrakar** |
| **Course:** | **UDEMY-The Python Mega Course: Build 10 real world applications** | **USN:** | | | **4AL17EC003** |
| **Topic:** | **Application 4: Build a Personal Website with Python and Flask** | **Semester & Section:** | | | **6th-‘A’** |
| **AFTERNOON SESSION DETAILS** | | | | | |
| **Image of session** | | | | | |
| **Report – Report can be typed or hand written for up to two pages.** | | | | | |