

Sample Matlab Programs for Computational Physics I

By

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A program that tells you the round-off error in your computer

```
% This is a program for testing round-off error in your PC
% By Baylie Damtie @Bahir Dar University
eps=1
while ((1+eps)>1)
    eps=eps/2;
end
eps=2*eps
```

Taylor expansion

```
% This is a program that evaluate the factorial in Taylor expansion theorem (first order)
% By Baylie Damtie @Bahir Dar University
clear all
clc
for i=1:200;
    a=ones(i);
    Vam(i)=det(expm(a));
    av=eye(i)+a+1/factorial(2)*a^2+1/factorial(3)*a^3+1/factorial(4)*a^4+1/factorial(5)*a^5;
    VaE(i)=det(av);
end
semilogy(1:200,Vam,'ob')
hold on
semilogy(1:200,VaE,'-r')
```

Base conversion program

```
% This is a program that converts any number in base ten to base two
% Developed by Baylie Damtie @Bahir Dar University
clear all
%x=input('Please insert your number in base ten')
x=417;
n=1;
while round(x)/2>=1
    y=x/2;
```

```
p(n)=y-(floor(y));  
    x=floor(y);  
    n=1+n;  
end  
p(n)=1;  
p=flipud(round(p)');  
p=p';
```