

Assignment-8

i) Calculate the following :-

$$i) \left(\frac{1}{(5^2)} + \frac{3}{2} * \pi - 1 \right)^{-3} \quad \text{Code: } \cancel{\text{less code}}$$

Output -

ans =

$$0.0139$$

ii) Code \rightarrow

$$2 * \pi - \pi^0.5$$

Output -

ans =

$$4.5107$$

iii) Code \rightarrow

$$1 + \frac{1}{2} + \frac{1}{2^2} + \frac{1}{3^3} + \frac{1}{4^4}$$

Output \rightarrow

ans =

$$1.8945$$

iv) If $v=1$ and $v=3$, then calculate :-

$$(4 * v) / (3 * v)$$

Code \rightarrow

$$v=1; v=3$$

$$(4 * v) / (3 * v)$$

Output -

ans =

$$0.4444$$

$$v) \frac{(2 * v^{-2})}{(u+v)^2}$$

Code \rightarrow

$$v=1; v=3$$

$$(2 * v^{-2}) / (u+v)^2$$

Output -

$$\text{ans} = 0.0139$$

$$vi) \frac{v^3}{(v^3 - u^3)}$$

Code \rightarrow

$$v=1; v=3$$

$$\frac{v^3}{(v^3 - u^3)}$$

Output \rightarrow

ans =

$$\cancel{1.0385}$$

$$vii) \frac{(4/3) * \pi * v^2}{}$$

Code \rightarrow

$$v=1; v=3;$$

$$(4/3) * \pi * v^2$$

Output \rightarrow

ans =

$$37.6991$$

$$viii) u * \sqrt{v} + v$$

Code \rightarrow

$$u=1; v=3;$$

$$u * \sqrt{v} + v$$

Output \rightarrow

ans =

$$\cancel{2.7321}$$

$$ix) \log_{10}(c * r + u) / (v - u)$$

Code \rightarrow

$$v=1; v=3$$

$$\log_{10} \left(\frac{(v+u)}{(v-u)} \right)$$

Output →

ans = 0.3010

3) Create a script file for the above equation problem:-

Code →

Edit script.m
 $v=1; u=3;$

$$\begin{aligned} & (u+v) / (3-v) \\ & (2*v^2) / (u+v)^2 \\ & v^3 / (v^3 - u^3) \\ & (4/3)*\pi*v^2 \end{aligned}$$

$$u*sqrt(v+1)$$

$$\log_{10} \left(\frac{v+u}{v-u} \right)$$

Output →

$$\text{Ans} = 0.4444$$

$$\text{Ans} = 0.0139$$

$$\text{Ans} = 1.0385$$

$$\text{Ans} = 37.6991$$

$$\text{Ans} = 2.7321$$

$$\text{Ans} = 0.3010$$

4) Create a script file to calculate the approximate circumference of an ellipse with axes $a=5$ and $b=10$.

Code →

$$\begin{aligned} a &= 5; \\ b &= 10; \end{aligned}$$

$$\begin{aligned} h &= (a-b)^2 / (a+b)^2; \\ C &= \pi * (a+b) * \left(1 + \frac{3h}{10 + (4-3h)} \right) \end{aligned}$$

Output →

$$C = 48.2733$$

5) Create a script file to calculate the area and circumference of a circle of radius r , also then calculate the volume and surface area of sphere.

Code →

$$r = 10;$$

$$\text{area } A = \pi * r^2$$

$$\text{circumference } C = 2 * \pi * r$$

$$\text{volume } V = 4/3 * \pi * r^3$$

$$\text{surface area } S = 4 * \pi * r^2$$

Output →

$$\text{area } A = 314.1593$$

$$\text{circumference } C = 62.8319$$

$$\text{volume } V = 4186.66666$$

$$\text{surface area } S = 1256$$

6) Analysis about plot - i) Creating simple plots ii) Adding title, axis label and annotations iii) Multiple data sets in one plot.

Code →

i) $x = 0;$
 $b1 = 100;$
 $2 \times 1,$
 $y = \sin(x);$
plot - (x, y)

ii) x label ('x')
y label ('y')
title ('x v/s y graph')

iii) $a = [2, 4, 6, 8]$
 $b = [5, 10, 15, 10]$
plot - (a, b)

7) Matrix generation → i) Entering a matrix ii) Matrix indexing
iii) Create a sub-matrix iv) Deleting rows or columns v) Transposing a matrix vi) matrix generator

i) Code →

$a = [1, 2, 3, 4, 5, 6, 7, 8, 9]$

Output →

$a =$
 $\begin{matrix} 1 & 3 & 5 \\ 2 & 4 & 6 \\ 7 & 8 & 9 \end{matrix}$

ii) Code →

$a(3, 3)$

Output →

10

iv) Code →

$a(1:6)$

Output →

1 2 3 4 5

iv) Code →

$a(2, :) = []$

$a(:, 2) = []$

Output →

$a =$
 $\begin{matrix} 1 & 3 & 5 \\ 7 & 8 & 10 \end{matrix}$

$a =$
 $\begin{matrix} 1 & 5 \\ 7 & 10 \end{matrix}$

v) Code →

a'

Output →

ans =

1	7
5	10

vii) Code →

b = magic(3)

Output →

b =	8	1	6
	3	5	7
	4	9	2

- 8) Basic commands to create function
9) Multiply two numbers i) Adding any two numbers
 ii) Transform year in day.

Code →

i) function [s] = add [x, y]

s = x + y;

Output →

$\text{z} = \text{add}(2, 3)$

$\text{z} = 5$

.ii) code →

function [p] = product (a, b)

p = a * b

Output →

m = product(5, 5)

m = 25

iii) Code -

function numDay = year2day(year)

numDay = days(datetime(year, 12, 31) - datetime(year, 1, 1))

end

Output -

year2days(2000)

ans = 366

8) ~~for~~ receives a vector and display all the element of the element

Code -

```
A = [3, 4, 5, 6, 7];  
for i = 1;  
    length(A)  
    display(A(i))  
end
```

Output - 8

3

4

5

6

7

9) Create a script for line specifications

Code →

```
x = [3, 9];  
y = [15, 12];  
P1 = line(x, y);  
P1.color = 'green';  
P1.lineStyle = '--';
```

10) Create a script for disp() and fprintf(). operation

Code →

```
a = [1.02, 2.05]  
fprintf("%d\n", round(a));  
disp(a)
```

Output -

1

2

1.02, 2.05

11) Create a script for input values from keyboard

Code →

`prompt = "what is the original value : "`

`a = input(prompt)`

`y = a * 10`

Output :-

`x = 42`

`y = 420`

12) Create a script for system clock information

Code →

format short
C = clock

Output →

C = 2022.9 15 17 33.55

13) Create a script for linear vector spacing

Code →

a = 1:6;
disp(a)

Output →

a = 1 2 3 4 5 6

14) Create a script for logarithmic vector spacing

Code →

y = logspace(1, 3, 7)
disp(y)

Output -

y = 1 * 7 * 10⁷

0.001 0.005 0.0022 0.0100
0.0464 0.2154 1.0000

15) Create a script to plot a line on 3D plane

Code →

t = 0;
pi/50;
10*pi;
st = sin(t);
ct = cos(t);
plot 3D(st, ct, t)

16) Create a script for plotting the value of logarithmic domain

Code →

y = [0.001 0.01 0.1 1 10 100];
log(log(y))
guide()