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#include<stdio.h>
#include<stdlib.h>
#include <math.h>
#define PI 3.14

void cylinder (float *, float *);
void cone (float *, float *);
void sphere (float *, float *);

int main()
{
    float area, volume;
    int choice, flag;

    do
    {
        printf ("\nEnter the choice of shape in int\n"
                "1 → cylinder & 2 → cone & 3 → sphere\nchoice:");
        scanf ("%d", &choice);
        switch (choice)
        {
            case 1: cylinder (&area, &volume);
                      break;
            case 2: cone (&area, &volume);
                      break;
            case 3: sphere (&area, &volume);
                      break;
            default: printf ("\nInput Error!!.");
                      exit(0);
        }
        printf ("\nThe Area = %.2f And volume = %.2f\n",
               area, volume);
        printf ("\nPress 1 to continue : ");
        scanf ("%d", &flag);
    } while (flag == 1);
    return 0;
}

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void cylinder (float *a, float *v)
{
    float r,h;
    printf ("Enter the radius and height : \n");
    scanf ("%f %f", &r, &h);
    *a = (2*pi*r) + (r+h);
    *v = pi*r*r*h;
}

void cone (float *a, float *v)
{
    float r,h;
    printf ("Enter the radius and height : \n");
    scanf ("%f %f", &r, &h);
    *a = (pi*r) + (r + sqrt(r+r+h));
    *v = pi*r*r*h/3;
}

void sphere (float *a, float *v)
{
    float r;
    printf ("Enter the radius of sphere, in radius : ");
    scanf ("%f", &r);
    *a = 4*pi*r*r;
    *v = pi*r*r*r*4/3;
}

```

7.

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#include <stdio.h>
struct student
{
    char Name[30];
    int elective;
};

void getdata (struct student *, int);
int count (struct student *, int, int);
void check (int *, struct student *, int);
void se_getdata (struct student *, int, int *, int);
void display (struct student *, int *, int);

int main()
{
    int n, E[3];
    printf("Entered the No. of students : ");
    scanf("%d", &n);
    struct Student S[n];
    getdata (S, n);
    for (int i=1; i<n; i++)
    {
        E[i-1] = count (S, i, n);
    }
    check (E, S, n);
    display (S, E, n);
    return 0;
}

void getdata (struct student * S, int n)
{
    for (int i=0; i<n; i++)
    {
        printf("Entered the Name of student &
               choice of Elective : ");
        scanf("%s %d", &S[i].Name, &S[i].elective);
    }
}

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int count (struct student *S, int k, int n)
{
    int c=0;
    for (int i=0; i<n; i++)
        if (SC[i].Elective == k)
            c++;
    return c;
}

void check (int &E, struct student *S, int n)
{
    printf ("In the current electives are: IOT:1-d\n"
            "Advanced Java & J2EE : 2-d Advanced Data\n"
            "structure : 3-d ", E[0], E[1], E[2]);

    int net;
    net = (int) (.3*n);
    for (int i=1; i<=3; i++)
    {
        if (E[i-1] < net)
        {
            printf ("An elective no %d is not available\n"
                    "recheck the elective no (%d)", i);
            re-getdata (S, i, E, n);
            if (E[i-1] == 0)
                printf ("An elective no %d is no more", i);
        }
    }
}

```

```

void re-getdata (struct student * S, int &K, int &E, int n)
{
    int temp;
    for (int i=0; i<n; i++)
        if (SC[i].Elective == K)
    {
        printf ("Do S: Enter other than 0-d elective :",
                SC[i].name, K);
        scanf ("%d", &temp);
        SC[i].Elective = temp;
        E[temp-1]++;
        E[K-1]--;
    }
}

```

```

    void display (struct student *s, int *E, int n)
{
    for (int i=1; i <= 3; i++)
    {
        printf("In %n No of students in (%.1f) elective are : %.1f\n",
               i, E[i-1]);
        for (int j=0; j < n; j++)
            if (s[j].elective == i)
                printf ("%.s \n", s[j].name);
    }
}

```

Output of program is

Elective 1: 3
Elective 2: 2
Elective 3: 1

(Ans: 2.0 3.0 1.0)

Students in each elective are

Elective 1: John, David, Tom, Sam

Elective 2: Peter, Paul, Mark

Elective 3: Anna

Program execution output is

8

8

8

8

Output of program is 8 as it is printing first 8 elements of array.

8

8 8 8 8

8 8 8 8 8 8 8 8

Output of program is 8 as it is printing first 8 elements of array.

8 8 8 8 8 8 8 8

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8 8 8 8 8 8 8 8