

**[CS KMUTNB]**  
**Lab2: Basic C Programming**

## 1. Please write a program to find **Cylinder Volume**

The volume of a cylinder is defined by the formula:

$$V = \pi r^2 h.$$

*In this formula, **r** is the radius of the cylinder cross section, while **h** is the height of the cylinder.*

*Write a program to calculate the volume for one cylinder.*

*Your program should request the radius and height of a cylinder, then calculate and print the volume.*

Use  $\pi = 3.1416$ .

**See the sample runs below.**

### Sample Run 1

Enter radius and height of cylinder: 4 7

Volume of Cylinder radius 4.00 height 7.00 is 351.86

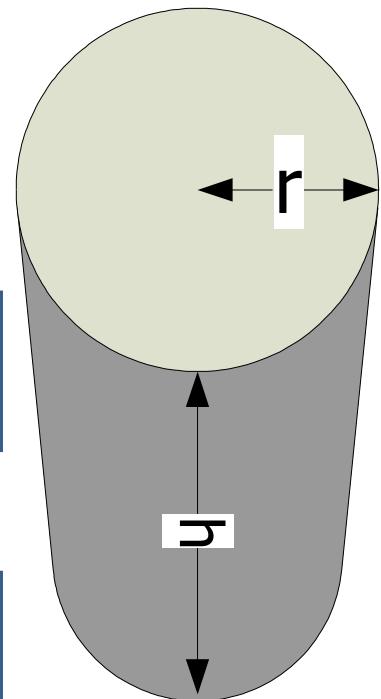
### Sample Run 2

Enter radius and height of cylinder: 7 8

Volume of Cylinder radius 7.00 height 8.00 is 1231.51

Your program should probably define a symbol for PI, for example:

```
#define pi 3.1416
```



ktop\cylinder.c - [Executing] - Dev-C++ 5.11

Project Execute Tools AStyle Window Help

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Old Enough.c cylinder.c

```
1 #include <stdio.h>
2 #define PI 3.1416
3
4 int main() {
5     double radius, height, volume;
6
7     printf("Enter radius and height of cylinder: ");
8     scanf("%lf %lf", &radius, &height);
9
10    volume = PI * radius * radius * height;
11
12    printf("Volume of Cylinder radius %.2lf height %.2lf is %.2lf\n", radius, height, volume);
13
14    return 0;
15 }
16
17
18
```

C:\Users\student\Desktop\cylinder.exe

Enter radius and height of cylinder: 4 7  
Volume of Cylinder radius 4.00 height 7.00 is 351.86

Process exited after 6.741 seconds with return value 0  
Press any key to continue . . .

C:\Users\student\Desktop\cylinder.exe

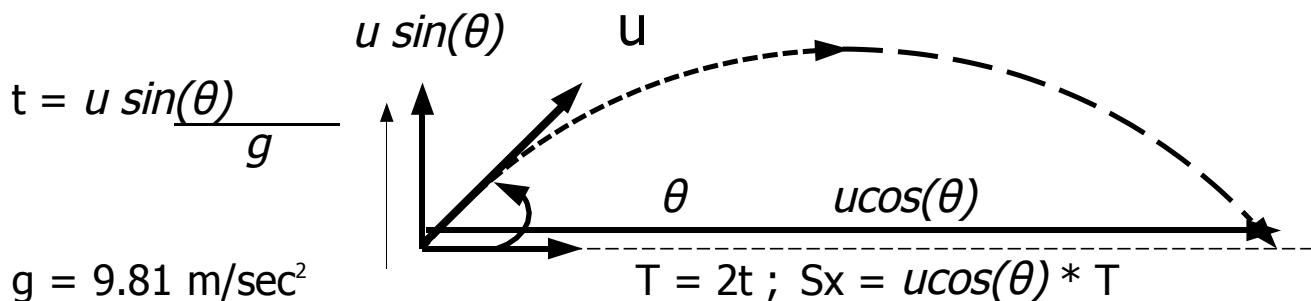
Enter radius and height of cylinder: 7 8  
Volume of Cylinder radius 7.00 height 8.00 is 1231.51

Process exited after 7.534 seconds with return value 0  
Press any key to continue . . .

resources Compile Log Debug Find Results Close

2. ถ้ายิงปืนให้ถูกความเร็วต้นเท่ากับ  $u$  ทำมุม  $\theta$  กับแนวระดับ

จะหาระยะทางและเวลาที่ลูกปืนให้ถูกจังตกลงพื้น



- วิเคราะห์การเคลื่อนที่แบบ Projectile มีวิธีการคำนวณค่าต่าง ๆ ดังนี้

1. ความเร็วต้นทางแกน Y ( $U_y$ ) และ X ( $U_x$ )

- $U_y = u * \sin(\theta)$     $U_x = u * \cos(\theta)$

2. เวลาที่ใช้เคลื่อนที่ถึงจุดสูงสุด ( $t$ ) และเวลาที่วัตถุตกลงพื้น ( $T$ )

- $t = u * \sin(\theta) / g$     $T = 2t = 2u * \sin(\theta) / g$

3. ระยะทางที่วัตถุขึ้นสูงสุด ( $S_y$ ) ระยะทางที่วัตถุไปได้ไกลสุด ( $S_x$ )

- $S_y = u^2 * \sin^2(\theta) / 2g$     $S_x = u * \cos(\theta) * T$

- ตั้งคำถามเพื่ออ่านค่า

- $u$  เป็นเลขจำนวนจริง เก็บไว้ในตัวแปร  $u$

- $\theta$  เป็นเลขจำนวนจริง เก็บไว้ในตัวแปร  $z$

- ต้องรู้

- การคำนวณพังก์ชันทางเรขาคณิต จะใช้มุมในหน่วย radian แต่การวัดมุมใช้หน่วย degree โดยสูตรการแปลงมุมคือ  $radian = degree * \pi / 180.0$

- ต้อง include `math.h` จึงจะใช้สูตรคำนวณได้

- ต้องคำนวณ

- $radian = 180 * 3.14159 / 180.0$

- $T = 2u * \sin(radian) / g$

- $S_x = u * \cos(radian) * T$

- ต้องการให้แสดงผล  $T$ ,  $S_x$

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Globals

Debug OldEnough.c 2.c

```
1 #include <stdio.h>
2 #include <math.h>
3 #define G 9.81
4 int main() {
5     double u, angle, radian, t, T, Sx;
6     printf("Enter initial velocity (u) and angle (in degrees): ");
7     scanf("%lf %lf", &u, &angle);
8     radian = angle * M_PI / 180.0;
9     t = u * sin(radian) / G;
10    T = 2 * t;
11    Sx = u * cos(radian) * T;
12    printf("Time to hit the ground (T): %.2lf seconds\n", T);
13    printf("Maximum range (Sx): %.2lf meters\n", Sx);
14    return 0;
15 }
16
17
18
```

C:\Users\student\Desktop\2.exe

Enter initial velocity (u) and angle (in degrees): 10 60  
Time to hit the ground (T): 1.77 seconds  
Maximum range (Sx): 8.83 meters

Process exited after 28.8 seconds with return value 0  
Press any key to continue . . .

### 3. Find and fill in the blank blocks with the actual display results.

```
char str[30] = "CS 36-R&D"; int a = 180; double r = 13.14;
int b=-5; int c=-12; double s=786.256;

*** =space
```

<code>printf("%%s",str);</code>	* + C S 3 6 - R & D + +
<code>printf("%%10s",str );</code>	* * C S 3 6 - R L D + +
<code>printf("%%-10s",str );</code>	* + C S 3 6 - R & D + +
<code>printf("%%d",a );</code>	* * 1 8 0 + +
<code>printf("%%10d",a );</code>	* * 1 8 0 + +
<code>printf("%%-10d",a );</code>	* + 1 8 0 + +
<code>printf("%%lf", r );</code>	* + 1 3 . 1 4 0 0 0 0 + +
<code>printf("%%.2lf", r );</code>	* + 1 3 . 1 4 + +
<code>printf("%%12.2lf", r );</code>	* * 1 3 . 1 4 + +
<code>printf("%%e", r );</code>	* + 1 . 3 1 4 0 0 0 e + 0 0 1 + +
<code>printf("%%.2e", s );</code>	* + 7 . 8 6 e + 0 0 2 + +
<code>printf("%%.2lf", s );</code>	* + 7 8 6 . 2 6 + +
<code>printf("%%12.2lf", s );</code>	* * 7 8 6 . 2 6 + +
<code>printf("++%dx%d", b, c );</code>	* + - 5 x + - 1 2 +
<code>printf("%+dx%d", b, c );</code>	* - 5 x - 1 2 +
<code>printf("%dx%d", b, c );</code>	* - 5 x + - 1 2 +
<code>printf("%dx%d", b, a );</code>	* - 5 x + 1 8 0 +
<code>printf("%+dx%d", a, c );</code>	* + 1 8 0 x - 1 2 +

```
1 #include <stdio.h>
2
3 int main() {
4     char str[30] = "CS 36-R&D";
5     int a = 180;
6     double r = 13.14;
7     double s = 786.256;
8     int b = -5, c = -12;
9
10    printf("%%s\n", str);
11    printf("%%10s\n", str);
12    printf("%%-10s\n", str);
13    printf("%%d\n", a);
14    printf("%%10d\n", a);
15    printf("%%-10d\n", a);
16    printf("%%lf\n", r);
17    printf("%%.21f\n", r);
18    printf("%%12.21f\n", r);
19    printf("%%e\n", r);
20    printf("%%.2e\n", s);
21    printf("%%.21f\n", s);
22    printf("%%12.21f\n", s);
23    printf(" %+dX%+d\n", b, c);
24    printf(" %+dX%+d\n", b, c);
25    printf(" %%dX%+d\n", b, a);
26    printf(" %+dX%+d\n", a, c);
27
28    return 0;
29 }
30
```

```
Select C:\Users\student\Desktop\Untitled4.exe
**CS 36-R&D**
** CS 36-R&D**
**CS 36-R&D **
**180**
**      180**
**180      **
**13. 140000**
**13. 14**
**      13. 14**
**1. 314000e+001**
**7. 86e+002**
**786. 26**
**      786. 26**
*+ 5X+12*
*-5X-12*
*-5X+180*
*+180X-12*
-----
Process exited after 0.01002 seconds with return value 0
Press any key to continue . . .
```