

Assignment 6: Adding Vectors

6.1 Tangent of a Vector

For a two-dimensional vector $\vec{v} = (v_1, v_2)$, the tangent can be calculated as $t = v_2/v_1$. Once the tangent t is calculated, the angle between \vec{v} and x -axis can also be calculated using the function `atan`. The following code shows an example to calculate the angle:

```

1 #include <stdio.h>
2 #include <math.h>
3
4 int main()
5 {
6     double v1 = 1.0, v2 = sqrt(3.0);
7     double t = v2/v1;
8     double ra = atan(t);
9
10    printf("The angle in radian: %.2f\n", ra);
11
12    return 0;
13 }
```

Since the angle returned by `atan` is in radians, it can be converted into degrees using π which is 180° . The value of π can be calculated using `acos(-1.0)`.

6.2 Programming Assignment 6: addvec.c

Given two vectors $\vec{p} = (p_1, p_2)$ and $\vec{q} = (q_1, q_2)$, calculate $\vec{v} = \vec{p} + \vec{q}$ to measure the angle between \vec{v} and the x -axis. The angle should be printed in degrees.

Note that the added vector of two vectors is calculated by the sum of the corresponding components. Given \vec{p} and \vec{q} , the added vector is $\vec{v} = (p_1 + q_1, p_2 + q_2)$.

The input consists of two lines in standard input. Each input line consists of two integers, the x - and y -component of the vector, separated by space. Assume that the integers are in the range of the type `int`. Your program should print the angle between the added vector and the x -axis in degrees. The degree should be printed to standard output rounded to two decimal places after the decimal point. If the added result is the zero vector ($\vec{0}$), just print 0.00.

Additional requirements for bonus points

- Define and use the type `Vector` using `struct` and `typedef`.
- Check the quality of your code to confirm that there are no style issues.

Input	Output
0 1 1 0	45.00
0 1 0 -1	0.00