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main.c

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```c
#include <stdio.h>
int gcdExtended(int a, int b, int* x, int* y) {
    if (a == 0) {
        *x = 0;
        *y = 1;
        return b;
    }
    int x1, y1;
    int gcd = gcdExtended(b % a, a, &x1, &y1);
    *x = y1 - (b / a) * x1;
    *y = x1;
    return gcd;
}
int modInverse(int e, int phi) {
    int x, y;
    int g = gcdExtended(e, phi, &x, &y);
    if (g != 1)
        return -1;
    else
        return (x % phi + phi) % phi;
}
int main() {
    int e = 31;
    int n = 3599;
```

Output

Clear

```
Public Key (e, n): (31, 3599)
p = 59, q = 61
φ(n) = 3480
Private Key d = 3031


=== Code Execution Successful ===
```

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```c
    *y = x1;
    return gcd;
}
int modInverse(int e, int phi) {
    int x, y;
    int g = gcdExtended(e, phi, &x, &y);
    if (g != 1)
        return -1;
    else
        return (x % phi + phi) % phi;
}
int main() {
    int e = 31;
    int n = 3599;
    int p = 59, q = 61;
    int phi = (p - 1) * (q - 1);
    int d = modInverse(e, phi);
    printf("Public Key (e, n): (%d, %d)\n", e, n);
    printf("p = %d, q = %d\n", p, q);
    printf("φ(n) = %d\n", phi);
    printf("Private Key d = %d\n", d);
    return 0;
}
```

Output

Clear

```
Public Key (e, n): (31, 3599)
p = 59, q = 61
φ(n) = 3480
Private Key d = 3031


=== Code Execution Successful ===
```

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