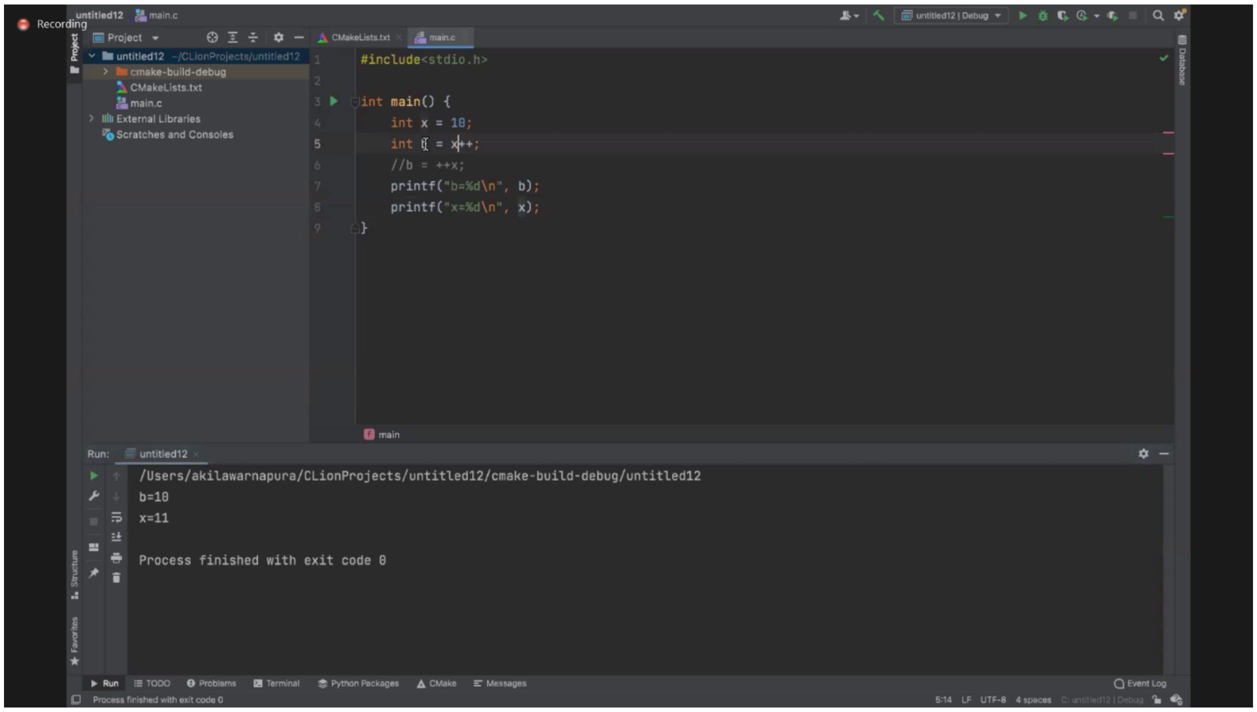
Exercise.

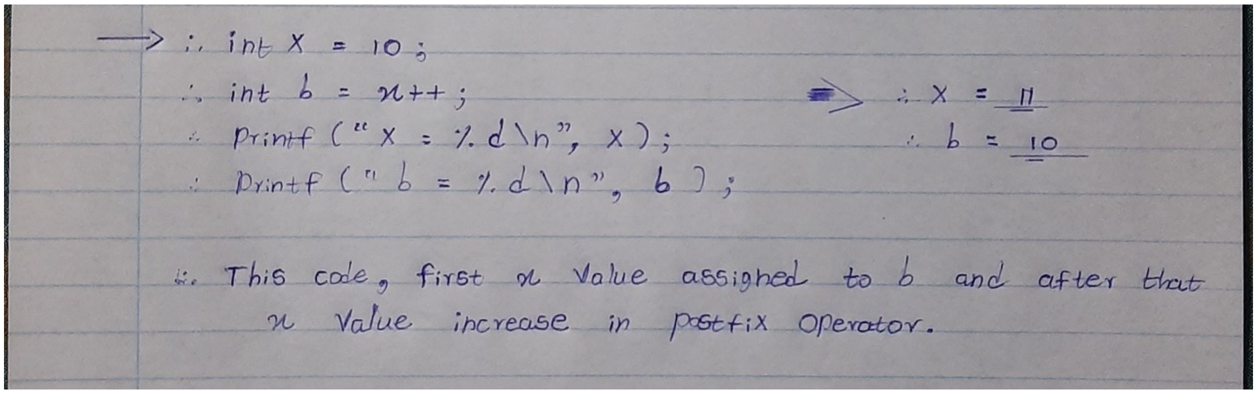
01.

a)



```
#include<stdio.h>

int main() {
    int x = 10;
    int b = x++;
    //b = ++x;
    printf("b=%d\n", b);
    printf("x=%d\n", x);
}
```

```
/Users/akilawarnapura/CLionProjects/untitled12/cmake-build-debug/untitled12
b=10
x=11

Process finished with exit code 0
```

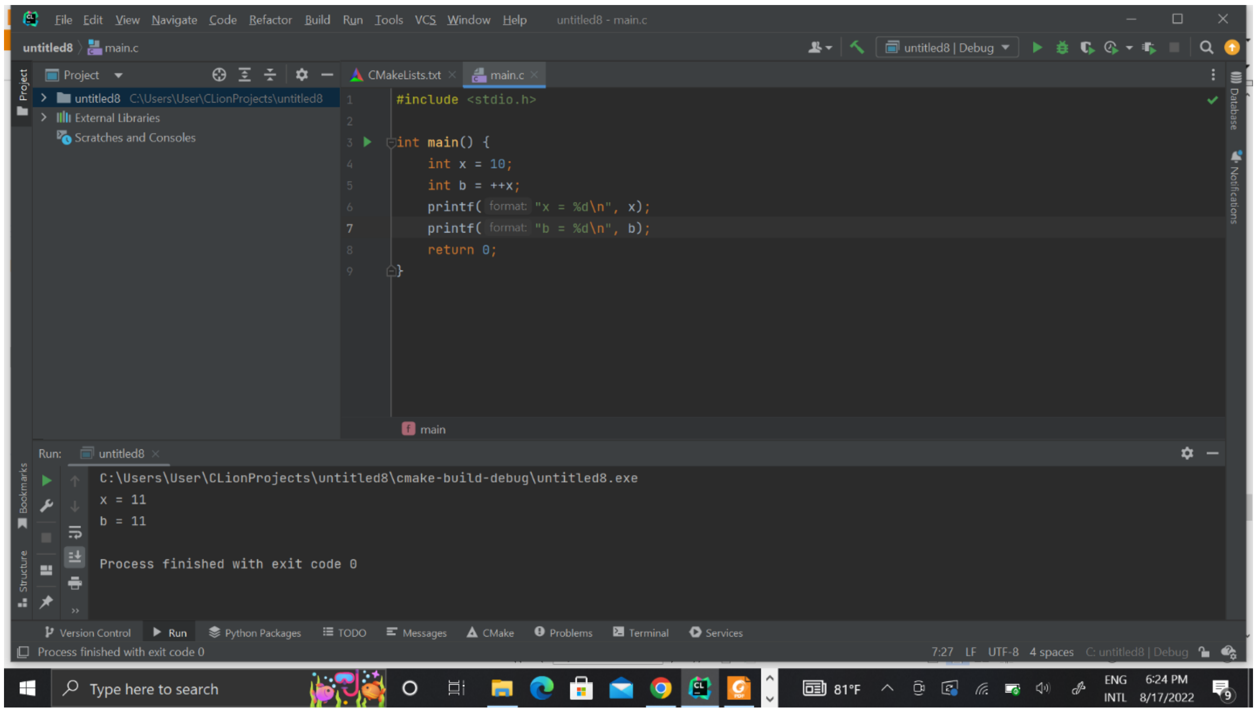


→ ∴ int x = 10;
∴ int b = x++;
∴ Printf ("x = %d\n", x);
∴ Printf ("b = %d\n", b);

⇒ ∴ x = 11
∴ b = 10

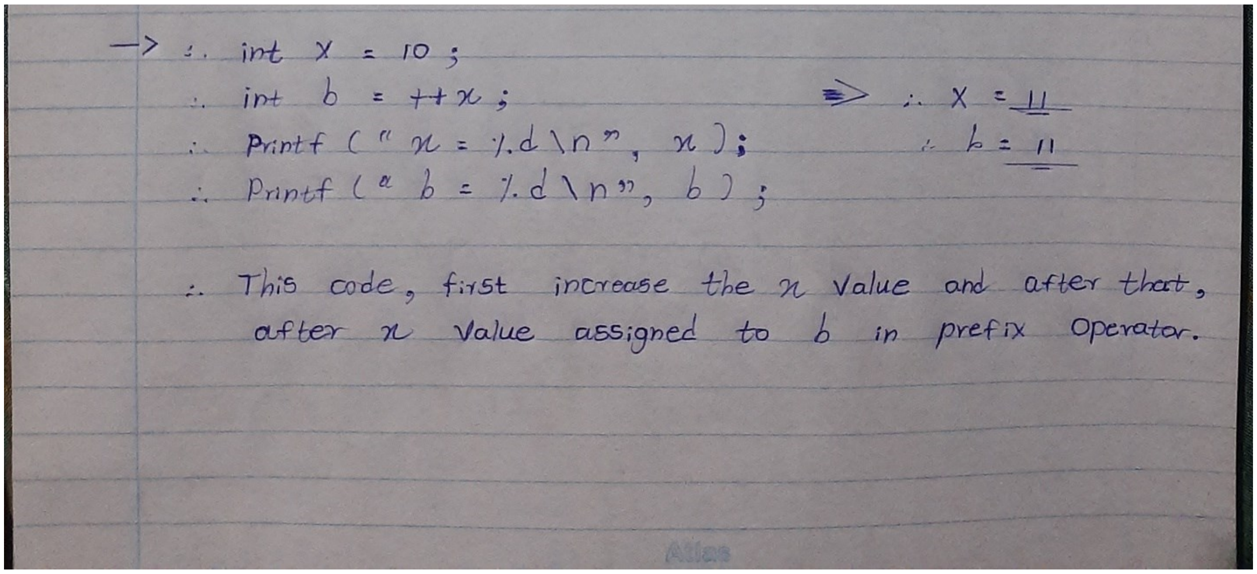
∴ This code, first x value assigned to b and after that x value increase in postfix operator.

b)



```c
#include <stdio.h>

int main() {
    int x = 10;
    int b = ++x;
    printf( format: "x = %d\n", x);
    printf( format: "b = %d\n", b);
    return 0;
}
```

```
C:\Users\User\CLionProjects\untitled8\cmake-build-debug\untitled8.exe
x = 11
b = 11

Process finished with exit code 0
```

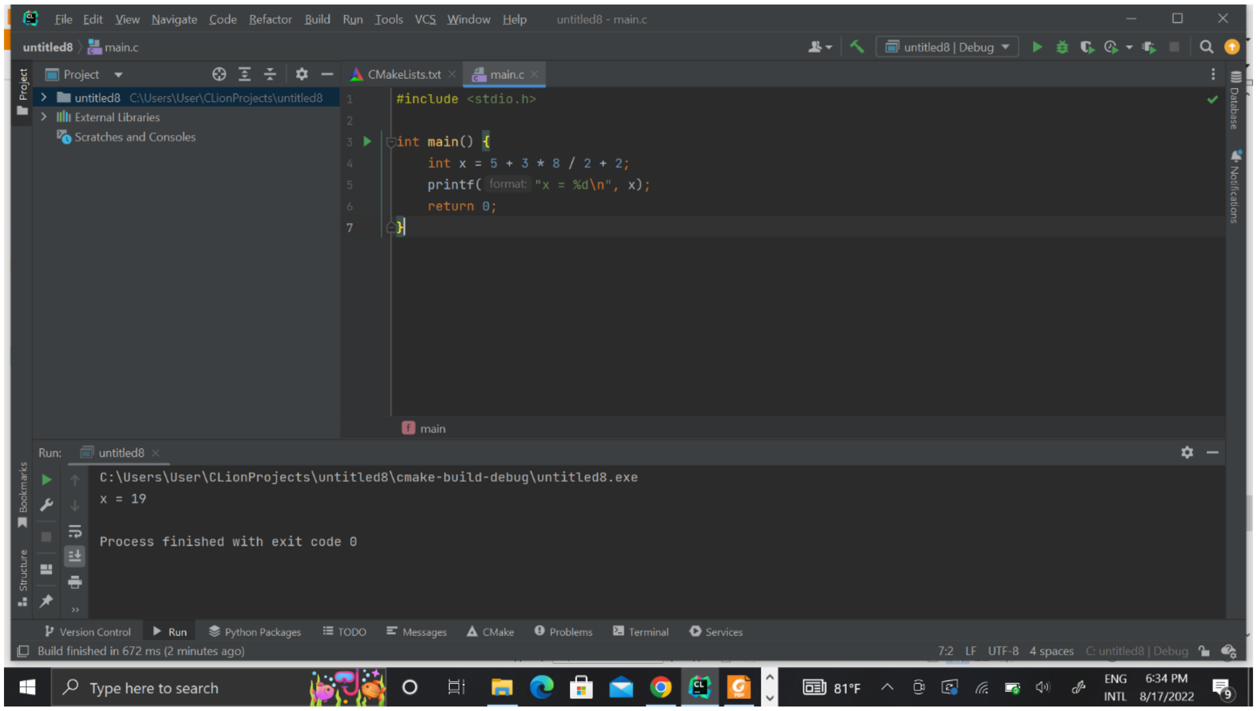


→ ∴ int x = 10;
∴ int b = ++x;
∴ Printf ("x = %d\n", x);
∴ Printf ("b = %d\n", b);

⟹ ∴ X = 11
∴ b = 11

∴ This code, first increase the x value and after that, after x value assigned to b in prefix Operator.

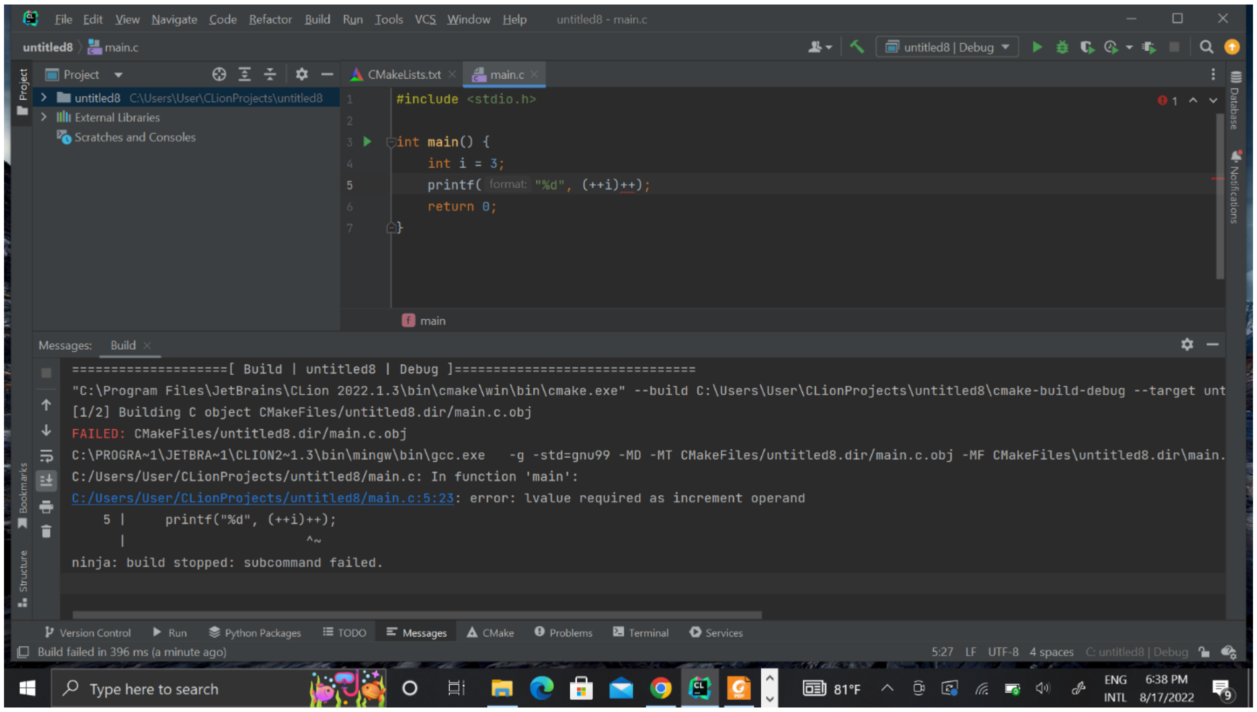
02.



```c
#include <stdio.h>

int main() {
    int x = 5 + 3 * 8 / 2 + 2;
    printf( format: "x = %d\n", x);
    return 0;
}
```

```
C:\Users\User\CLionProjects\untitled8\cmake-build-debug\untitled8.exe
x = 19

Process finished with exit code 0
```

03.

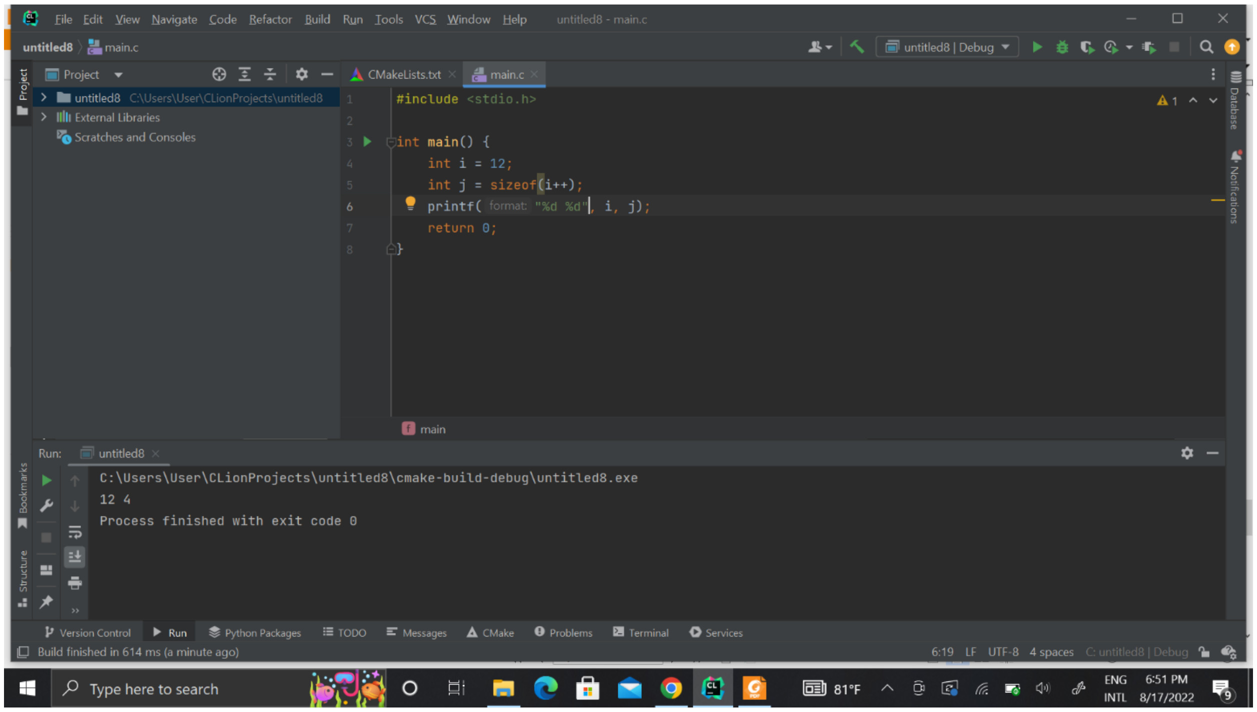


```c
#include <stdio.h>

int main() {
    int i = 3;
    printf( format: "%d", (++i)++);
    return 0;
}
```

```
====================[ Build | untitled8 | Debug ]==============================
"C:\Program Files\JetBrains\CLion 2022.1.3\bin\cmake\win\bin\cmake.exe" --build C:\Users\User\CLionProjects\untitled8\cmake-build-debug --target unt
[1/2] Building C object CMakeFiles/untitled8.dir/main.c.obj
FAILED: CMakeFiles/untitled8.dir/main.c.obj
C:\PROGRA~1\JETBRA~1\CLION2~1.3\bin\mingw\bin\gcc.exe   -g -std=gnu99 -MD -MT CMakeFiles/untitled8.dir/main.c.obj -MF CMakeFiles\untitled8.dir\main.
C:/Users/User/CLionProjects/untitled8/main.c: In function 'main':
C:/Users/User/CLionProjects/untitled8/main.c:5:23: error: lvalue required as increment operand
    5 |     printf("%d", (++i)++);
      |                       ^~
ninja: build stopped: subcommand failed.
```

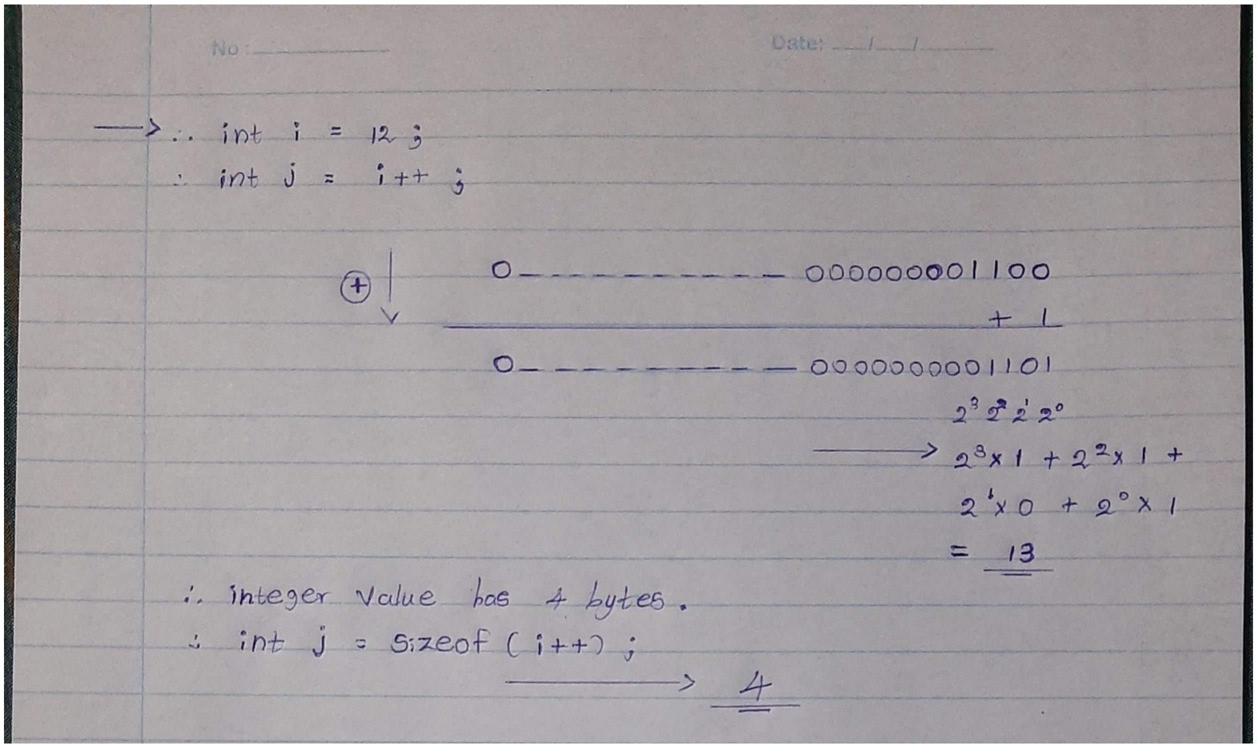
Build failed in 396 ms (a minute ago)

04.



```c
#include <stdio.h>

int main() {
    int i = 12;
    int j = sizeof(i++);
    printf( format: "%d %d", i, j);
    return 0;
}
```

```
C:\Users\User\CLionProjects\untitled8\cmake-build-debug\untitled8.exe
12 4
Process finished with exit code 0
```



No: ______ Date: __/__/__

→ ∴ int i = 12 ;

∴ int j = i++ ;

$$\begin{array}{r} 0 \text{ - - - - - - - - - - } 000000001100 \\ + \quad 1 \\ \hline 0 \text{ - - - - - - - - - - } 000000001101 \end{array}$$

$2^3\ 2^2\ 2^1\ 2^0$

$\longrightarrow 2^3 \times 1 + 2^2 \times 1 + 2^1 \times 0 + 2^0 \times 1$

$= \underline{\underline{13}}$

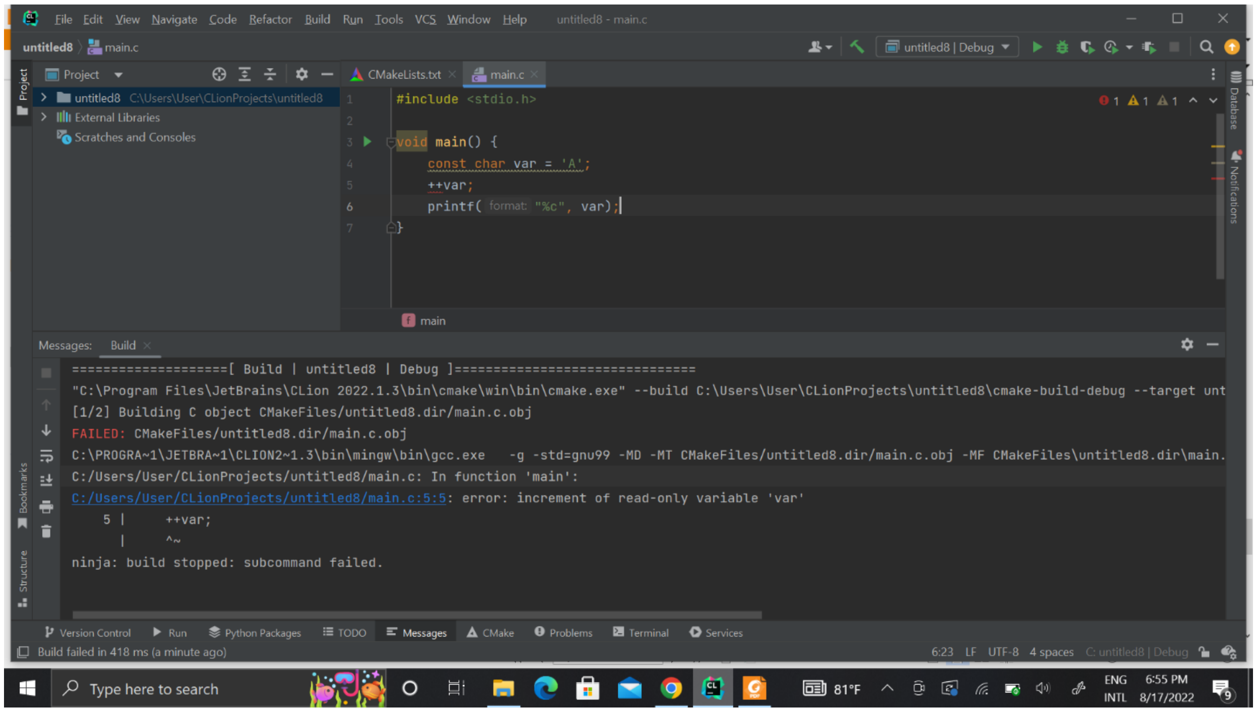
∴ integer value has 4 bytes.

∴ int j = sizeof (i++) ;

$\longrightarrow \underline{\underline{4}}$

05.

a)

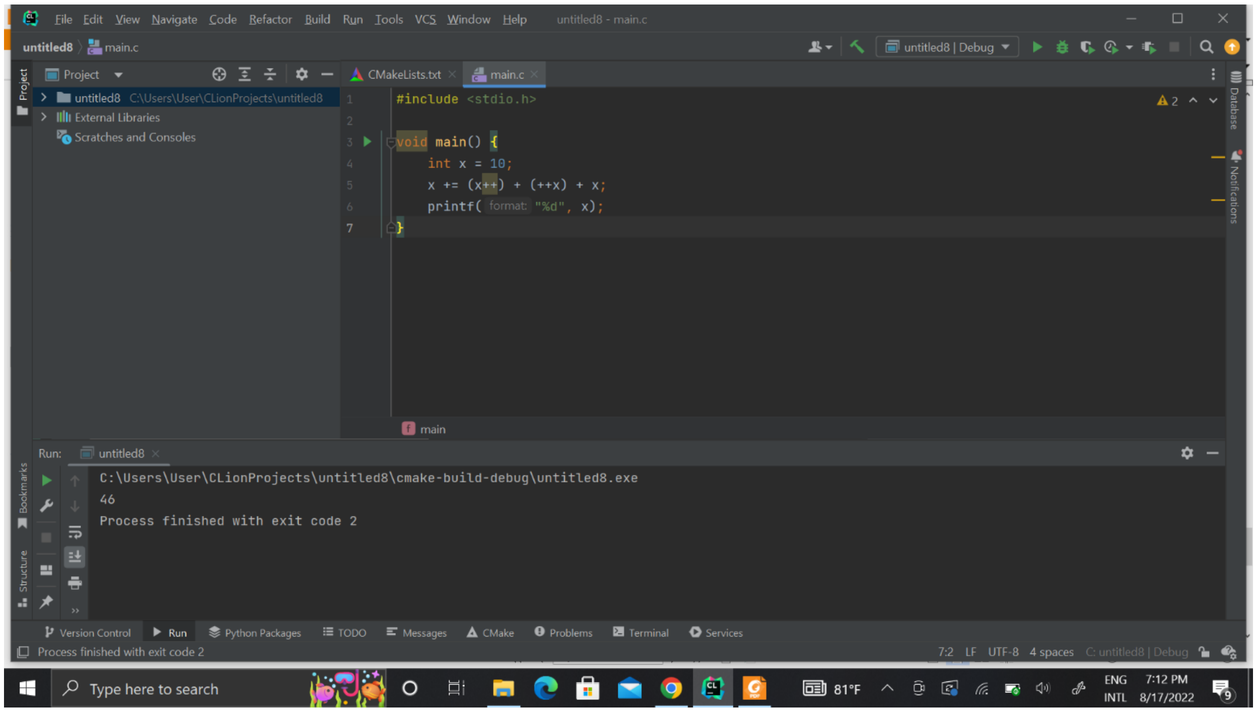


```c
#include <stdio.h>

void main() {
    const char var = 'A';
    ++var;
    printf("%c", var);
}
```

```
===================[ Build | untitled8 | Debug ]==============================
"C:\Program Files\JetBrains\CLion 2022.1.3\bin\cmake\win\bin\cmake.exe" --build C:\Users\User\CLionProjects\untitled8\cmake-build-debug --target unt
[1/2] Building C object CMakeFiles/untitled8.dir/main.c.obj
FAILED: CMakeFiles/untitled8.dir/main.c.obj
C:\PROGRA~1\JETBRA~1\CLION2~1.3\bin\mingw\bin\gcc.exe   -g -std=gnu99 -MD -MT CMakeFiles/untitled8.dir/main.c.obj -MF CMakeFiles\untitled8.dir\main.
C:/Users/User/CLionProjects/untitled8/main.c: In function 'main':
C:/Users/User/CLionProjects/untitled8/main.c:5:5: error: increment of read-only variable 'var'
    5 |     ++var;
      |     ^~
ninja: build stopped: subcommand failed.
```

Build failed in 418 ms (a minute ago)

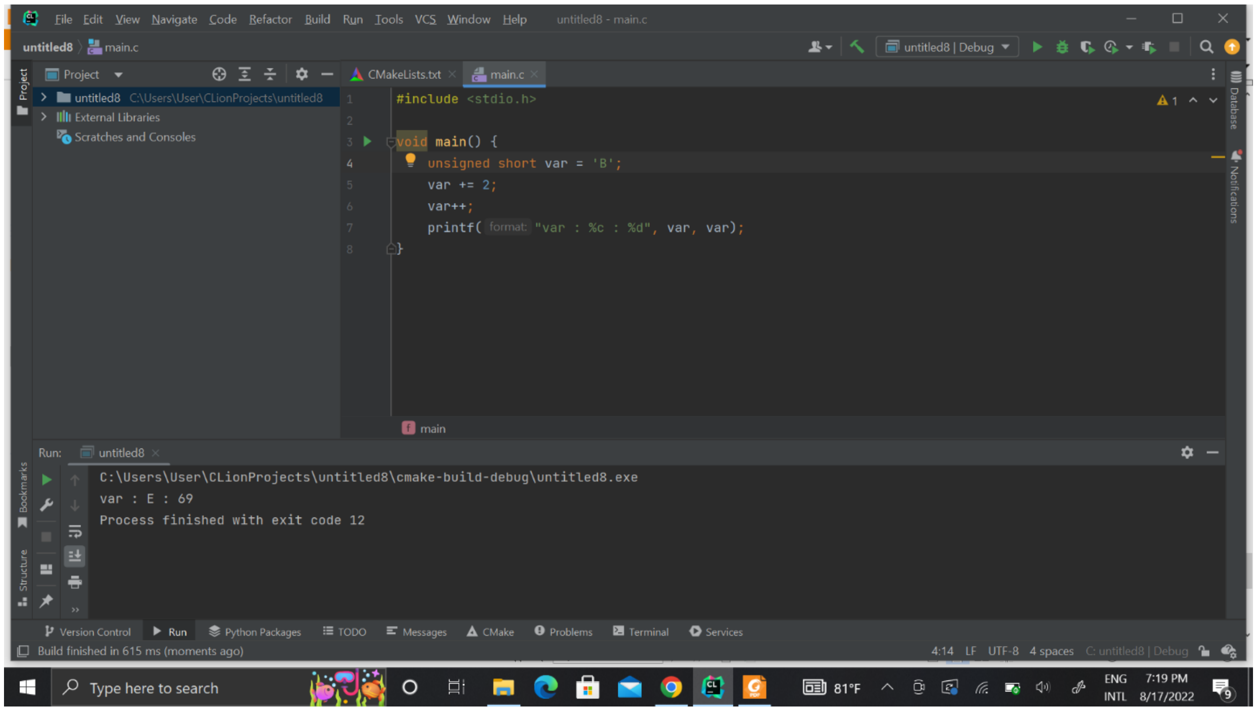
b)



```c
#include <stdio.h>

void main() {
    int x = 10;
    x += (x++) + (++x) + x;
    printf("%d", x);
}
```

```
C:\Users\User\CLionProjects\untitled8\cmake-build-debug\untitled8.exe
46
Process finished with exit code 2
```

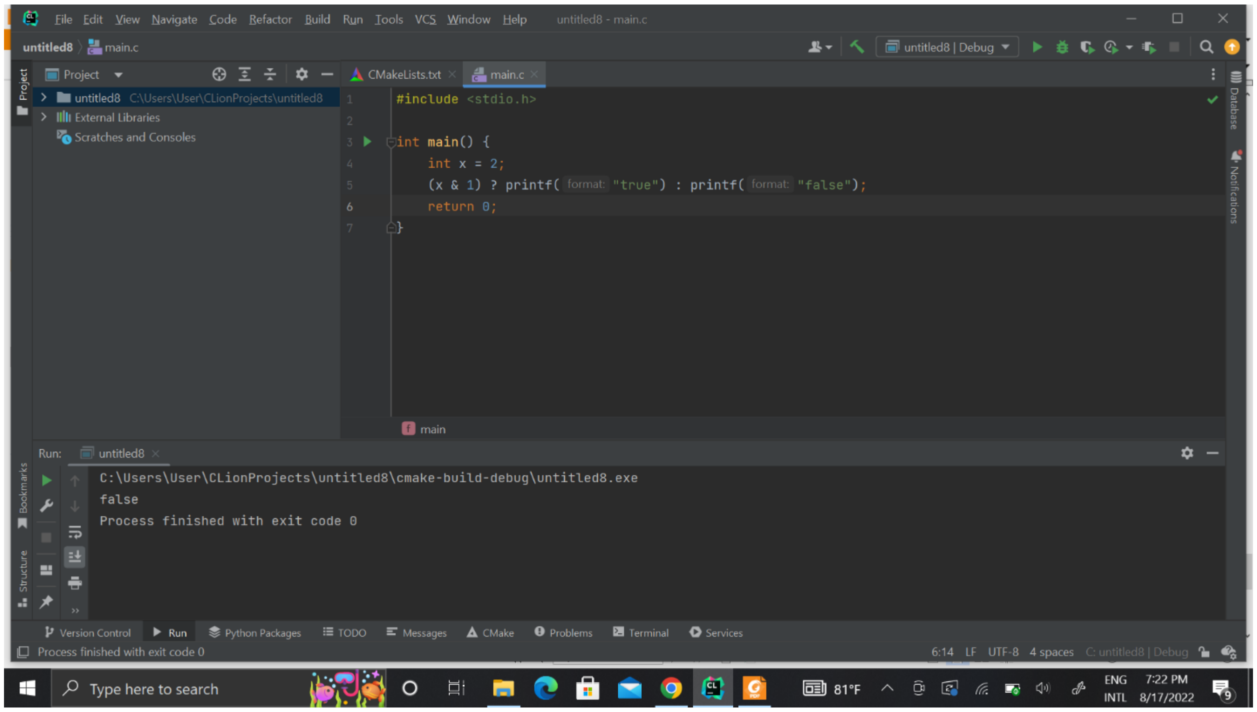
c)



```c
#include <stdio.h>

void main() {
    unsigned short var = 'B';
    var += 2;
    var++;
    printf( format: "var : %c : %d", var, var);
}
```

```
C:\Users\User\CLionProjects\untitled8\cmake-build-debug\untitled8.exe
var : E : 69
Process finished with exit code 12
```

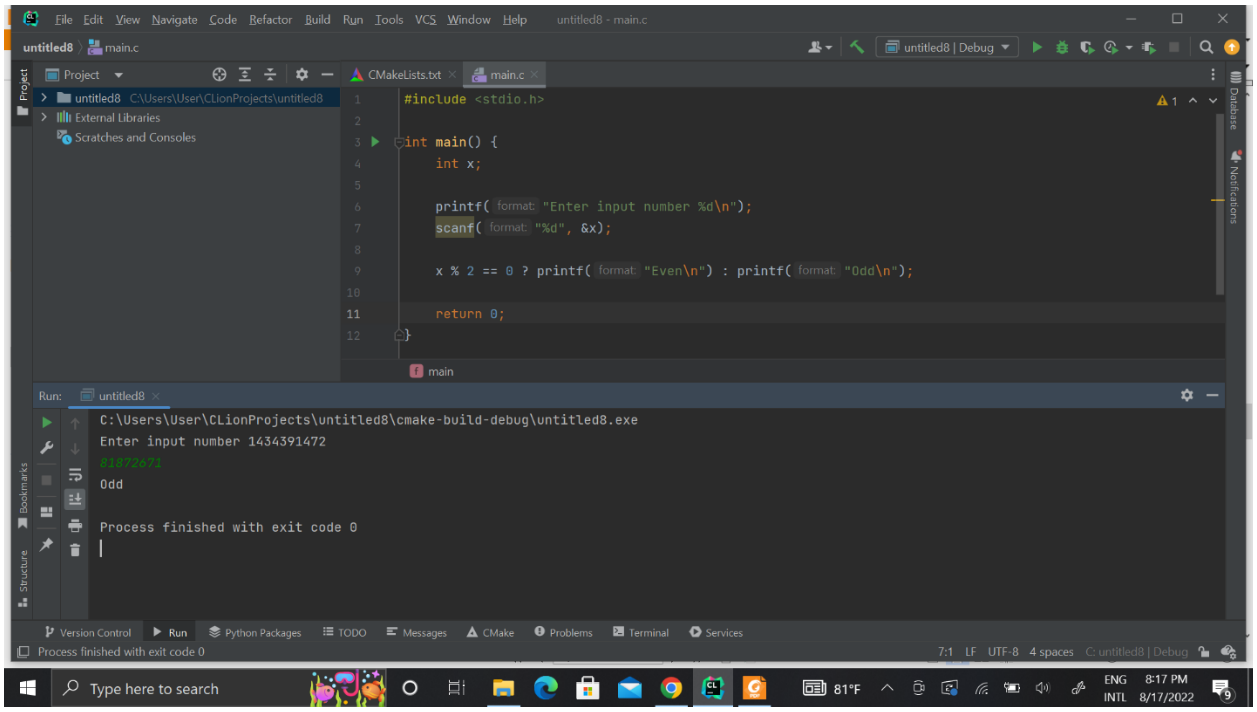
d)



```c
#include <stdio.h>

int main() {
    int x = 2;
    (x & 1) ? printf( format: "true") : printf( format: "false");
    return 0;
}
```

```
C:\Users\User\CLionProjects\untitled8\cmake-build-debug\untitled8.exe
false
Process finished with exit code 0
```

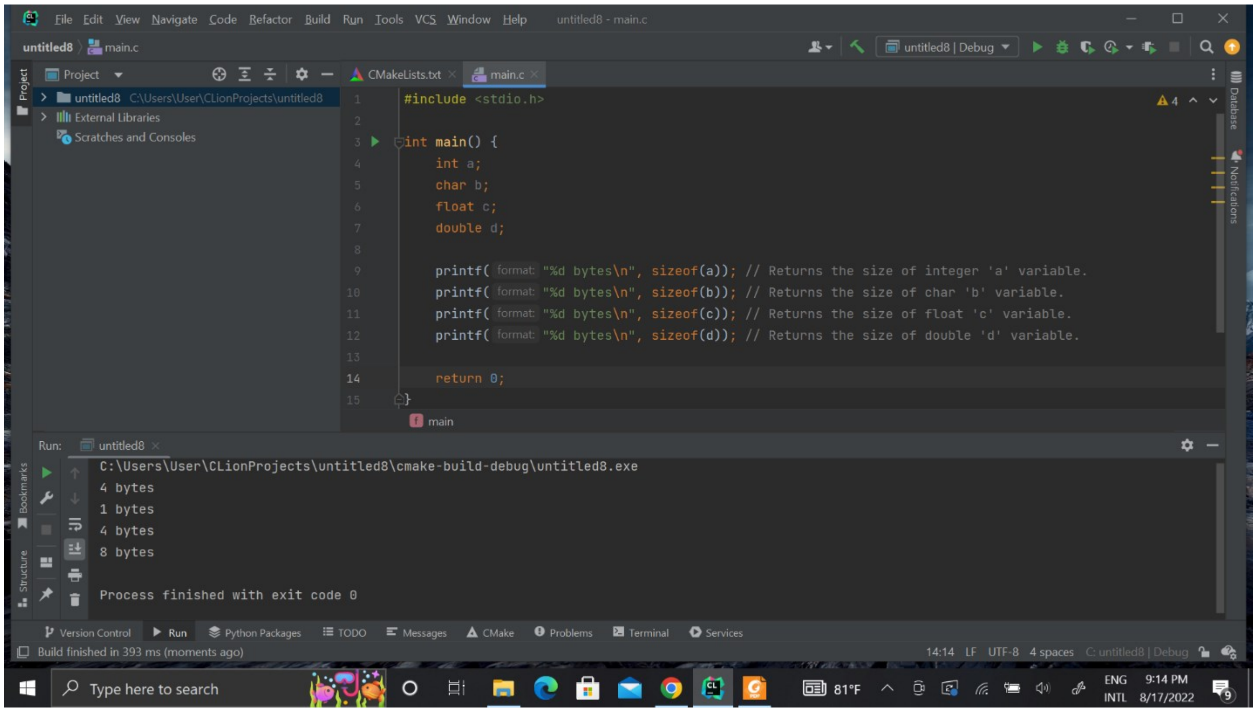
06)



```c
#include <stdio.h>

int main() {
    int x;

    printf( format: "Enter input number %d\n");
    scanf( format: "%d", &x);

    x % 2 == 0 ? printf( format: "Even\n") : printf( format: "Odd\n");

    return 0;
}
```

```
C:\Users\User\CLionProjects\untitled8\cmake-build-debug\untitled8.exe
Enter input number 1434391472
81872671
Odd

Process finished with exit code 0
```

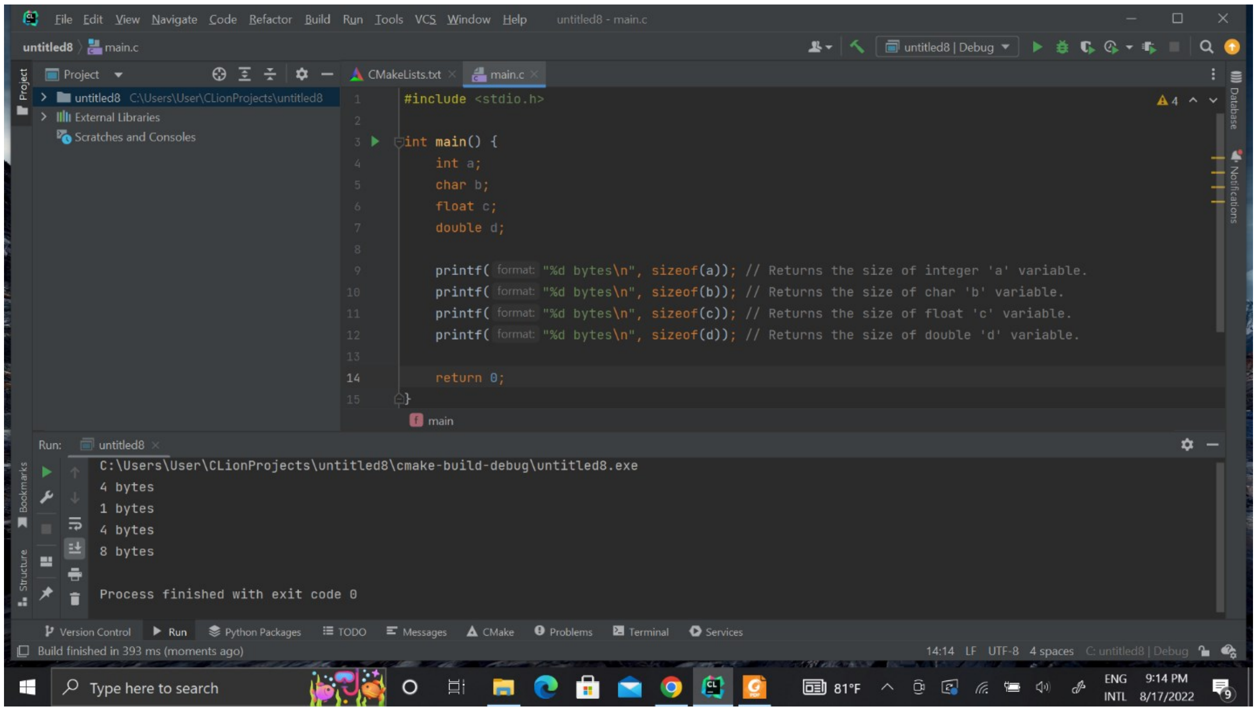
07)



```c
#include <stdio.h>

int main() {
    int a;
    char b;
    float c;
    double d;

    printf( format: "%d bytes\n", sizeof(a)); // Returns the size of integer 'a' variable.
    printf( format: "%d bytes\n", sizeof(b)); // Returns the size of char 'b' variable.
    printf( format: "%d bytes\n", sizeof(c)); // Returns the size of float 'c' variable.
    printf( format: "%d bytes\n", sizeof(d)); // Returns the size of double 'd' variable.

    return 0;
}
```

```
C:\Users\User\CLionProjects\untitled8\cmake-build-debug\untitled8.exe
4 bytes
1 bytes
4 bytes
8 bytes

Process finished with exit code 0
```

08)

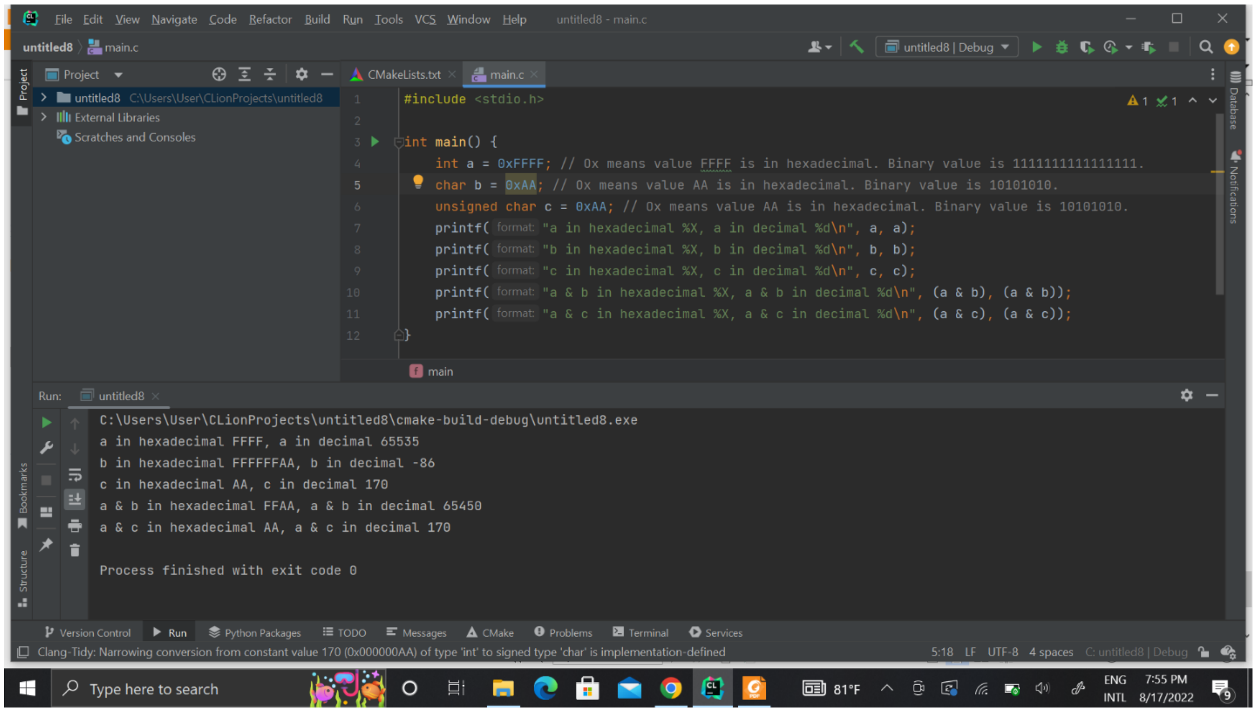


```c
#include <stdio.h>

int main() {
    int a;
    char b;
    float c;
    double d;

    printf("%d bytes\n", sizeof(a)); // Returns the size of integer 'a' variable.
    printf("%d bytes\n", sizeof(b)); // Returns the size of char 'b' variable.
    printf("%d bytes\n", sizeof(c)); // Returns the size of float 'c' variable.
    printf("%d bytes\n", sizeof(d)); // Returns the size of double 'd' variable.

    return 0;
}
```

```
C:\Users\User\CLionProjects\untitled8\cmake-build-debug\untitled8.exe
4 bytes
1 bytes
4 bytes
8 bytes

Process finished with exit code 0
```

Build finished in 393 ms (moments ago)

09)



```c
#include <stdio.h>

int main() {
    int a = 0xFFFF; // 0x means value FFFF is in hexadecimal. Binary value is 1111111111111111.
    char b = 0xAA; // 0x means value AA is in hexadecimal. Binary value is 10101010.
    unsigned char c = 0xAA; // 0x means value AA is in hexadecimal. Binary value is 10101010.
    printf("a in hexadecimal %X, a in decimal %d\n", a, a);
    printf("b in hexadecimal %X, b in decimal %d\n", b, b);
    printf("c in hexadecimal %X, c in decimal %d\n", c, c);
    printf("a & b in hexadecimal %X, a & b in decimal %d\n", (a & b), (a & b));
    printf("a & c in hexadecimal %X, a & c in decimal %d\n", (a & c), (a & c));
}
```

```
C:\Users\User\CLionProjects\untitled8\cmake-build-debug\untitled8.exe
a in hexadecimal FFFF, a in decimal 65535
b in hexadecimal FFFFFFAA, b in decimal -86
c in hexadecimal AA, c in decimal 170
a & b in hexadecimal FFAA, a & b in decimal 65450
a & c in hexadecimal AA, a & c in decimal 170

Process finished with exit code 0
```

Clang-Tidy: Narrowing conversion from constant value 170 (0x000000AA) of type 'int' to signed type 'char' is implementation-defined