

```

for (p = "azAZ0 !\t"; *p != '\0'; p++) {
    if (iscntrl(*p))
        printf("\x%02x:", *p);
    else
        printf("  %c:", *p);
    TEST(isalnum);
    TEST(isalpha);
    TEST(iscntrl);
    TEST(isdigit);
    TEST(isgraph);
    TEST(islower);
    TEST(isprint);
    TEST(ispunct);
    TEST(isspace);
    TEST(isupper);
    TEST(isxdigit);
    printf("\n");
}

return 0;
}

```

The program produces the following output:

	alnum	alpha	cntrl	digit	graph	lower	print	punct	space	upper	xdigit
a:	x	x			x	x	x				x
z:	x	x			x	x	x				
A:	x	x			x		x			x	x
Z:	x	x			x		x			x	
0:	x			x	x		x				x
:							x		x		
!:					x		x	x			
\x09:			x						x		

## Character Case-Mapping Functions

```

int tolower(int c);
int toupper(int c);

```

**tolower**    The `tolower` function returns the lower-case version of a letter passed to it as an argument, while `toupper` returns the upper-case version. If the argument to either function is not a letter, it returns the character unchanged.

### PROGRAM Testing the Case-Mapping Functions

The following program applies the case-mapping functions to the characters in the string "aA0!".