

Assignment 6: Standard library functions

You should read following topics before starting this exercise

1. Use of switch statement to create menus as in exercise3
2. Use of while and do while loops as in exercise4

A function is a named sub-module of a program, which performs a specific, well-defined task. It can accept information from the calling function in the form of arguments and return only 1 value. C provides a rich library of standard functions. We will explore some such function libraries and use these functions in our programs.

ctype.h : contains function prototypes for performing various operations on characters. Some commonly used functions are listed below.

Function Name	Purpose	Example
isalpha	Check whether a character is a alphabet	if (isalpha(ch))
isalnum	Check whether a character is alphanumeric	if (isalnum(ch))
isdigit	Check whether a character is a digit	if (isdigit(ch))
isspace	Check whether a character is a space	if (isspace(ch))
ispunct	Check whether a character is a punctuation symbol	if (ispunct(ch))
isupper	Check whether a character is uppercase alphabet	if (isupper(ch))
islower	Check whether a character is lowercase alphabet	if (islower(ch))
toupper	Converts a character to uppercase	ch = toupper(ch)
tolower	Converts a character to lowercase	ch = tolower(ch)

math.h : This contains function prototypes for performing various mathematical operations on numeric data. Some commonly used functions are listed below.

Function Name	Purpose	Example
cos	cosine	$a^2 + b^2 - 2ab \cos(\text{angle})$
exp(double x)	exponential function, computes e^x	exp(x)
log	natural logarithm	$c = \log(x)$
log10	base-10 logarithm	$y = \log_{10}(x)$
pow(x,y)	compute a value taken to an exponent, x^y	$y = 3^{\text{pow}(x, 10)}$
sin	sine	$z = \sin(x) / x$
sqrt	square root	$\text{delta} = \sqrt{b^2 - 4ac}$

Note: If you want to use any of the above functions you must include the library for example `#include <ctype.h>`

`#include <math.h>`

In case of math library, it needs to be linked to your program. You have to compile the program as follows

`$ cc filename -lm`

A program that does multiple tasks, provides a menu from which user can choose the appropriate task to be performed. The menu should appear again when the task is completed so that the user can choose another task. This process continues till the user decides to quit. A menu driven program can be written using a combination of do-while loop containing a switch statement. One of the options provided in a menu driven program is to exit the program.

Statement Syntax	Flowchart	Example
<pre>do { display menu; accept choice; switch(choice) { case value1: block1; break; case value2: block2; break; default :default block; } }while(choice != exit);</pre>	<pre> graph TD start([start]) --> Display[Display menu] Display --> Accept[/Accept choice/] Accept --> case1{case1} case1 -- True --> block1[block1] case1 -- False --> case2{case2} case2 -- True --> block2[block2] case2 -- False --> default[default block] block1 --> choice_exit{choice=exit} block2 --> choice_exit default --> choice_exit choice_exit -- True --> stop([stop]) choice_exit -- False --> Display </pre>	<pre>ch = getchar(); do { printf("\n 1 : ISUPPER "); printf("\n 2 : SLOWER"); printf("\n 3 : ISDIGIT"); printf("\n 4 : EXIT"); printf(" Enter your choice :"); scanf("%d", &choice); switch (choice) { case 1 : if (isupper(ch)) break; case 2 : if (is lower(ch)) break; case 3 : if (isdigit(ch)) printf(" Digit"); break; } } while (choice!=4);</pre>

Set A. Write C programs for the following problems

- Write a program, which accepts a character from the user and checks if it is an alphabet, digit or punctuation symbol. If it is an alphabet, check if it is uppercase or lower case and then change the case.

Set B. Write C programs for the following problems

- Accept x and y coordinates of two points and write a menu driven program to perform the following operations till the user selects Exit.
 - Slope of line between the points.
 - Check whether they lie in the same quadrant.
 - EXIT

(Hint: Use formula $m = (y_2 - y_1) / (x_2 - x_1)$ to calculate slope of line.)

Assignment Evaluation

0: Not done	<input type="checkbox"/>	2: Late Complete	<input type="checkbox"/>	4: Complete	<input type="checkbox"/>
1: Incomplete	<input type="checkbox"/>	3: Needs improvement	<input type="checkbox"/>	5: Well Done	<input type="checkbox"/>

Signature