



Data Structures and Program Design Using C

SCS 1301

AY 22 - Semester 1

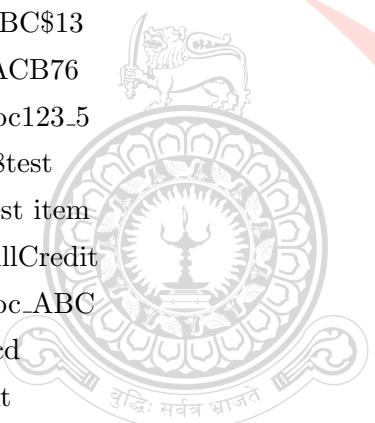


Exercise I

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- Which of the following are valid variable names?

- (a) ABC\$13
- (b) _ACB76
- (c) abc123_5
- (d) 98test
- (e) test item
- (f) fullCredit
- (g) abc_ABC
- (h) \$cd
- (i) int
- (j) if-else



- sizeof(parameter)** function is used to find the amount of space a given data type takes in memory. The parameter can be a variable declared in the program or a data type (e.g., int, float, etc.). Write a program to output the space taken by the primitive types.
- Consider the following C program (hello.c) and observe the intermediate outputs of the C compiler.

```
#include <stdio.h>

int main()
{
    printf("Hello World\n");

    return 0;
}
```

- (a) Preprocessor output (\$gcc -E hello.c)
- (b) Compiler output before assembler (\$gcc -S hello.c)
- (c) Object file creation (\$gcc -c hello.s)
- (d) Add comments to the program and observe how comments are handled by the preprocessor.
- (e) How is the *printf*(...) represented in the .s file generated?

4. Using the `<limits.h>` and `<float.h>` header files, write a program to find the maximum and minimum possible values of primitive data types in the C language.
5. Write C programs to produce the following formatted outputs given below using the `printf(...)` function.
- Consider a double variable `x` with a value of 125.456734516547332453425 and produce the following output:
 - 125.456735
 - 125.457
 - +1e+02
 - 1.254567E+02
 - 0X1.F5D3B2368E19CP+6
 - Consider an integer variable `y` with a value of 76 and produce the following output:
 - 76
 - 4c
 - 4C
 - 114
 - 0x4c
 - 0x4C
 - 0114
 - 0000000076
 - <8spaces>76
 - Consider five integer variables: day, month, year, hour, and minute. The initial values are 30, 4, 2024, 12, and 57. Produce the following date-time output:
 - 2024-04-30 12:57
 - 30/04/2024 12:57 Hrs
 - 4.30.2024 12 Hours 57 Minutes
 - 7e8430-012057
 - Consider a character variable `c` with the initial value 'A' and produce the following output:
 - A
 - 65