**Lab Sheet 2**

**Only a keen observer can be a good programmer**

**If you are too lazy to type , I have uploaded a .doc file too, copy and paste the programs. But don’t forget to use both hands while typing.**

1. **Escape Sequences (Back slash character constants)**

Try out the following and note down your observations:

1. printf(“Happy Onam”);
2. printf(“Happy

Onam”);

1. printf(“Happy \nOnam”);
2. printf(“Happy\t Onam”);
3. printf(“Happy\b Onam”);
4. printf(“Happy “Onam”);
5. printf(“Happy \”Onam”);
6. printf(“Happy\ Onam”);
7. printf(“Happy\\ Onam”);
8. Is it possible to have an identifier called ‘\_’ ?. Try it out?
9. **Data types**

As we have discussed in the class, the size of data types varies from platform to platform.

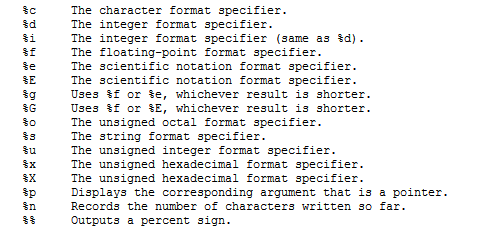
Try out the following and find out the size of each type of data.

(sizeof is a unary operator which generates the size of a variable or a data type in bytes)

1. printf(“%d”,sizeof(int));
2. printf(“%d”,sizeof(short int));
3. printf(“%d”,sizeof(long int));
4. printf(“%d”,sizeof(signed int));
5. printf(“%d”,sizeof(unsigned int));
6. printf(“%d”,sizeof(char));
7. printf(“%d”,sizeof(signed char));
8. printf(“%d”,sizeof(unsigned char));
9. printf(“%d”,sizeof(float));
10. printf(“%d”,sizeof(double));
11. printf(“%d”,sizeof(long double));

Can we use ‘signed’ or ‘unsigned’ along with ‘float or ‘double’? Try out ‘signed float’ or ‘unsigned double’. Note down your observations.

1. **Format specifiers**



Try out the following:

1. int main()

{

int a=65;

printf("%d",a);

}

1. int main()

{

int a=65;

printf("%c",a);

}

Why did you get the output as ‘A’ ? Recollect about the concept of ASCII values that we have discussed in the class. Try out different values for a.

1. Can you find out the ASCII value for the character ‘\*’ ?
2. int main()

{

float a=65;

printf("%d",a);

}

1. int main()

{

float a=65;

printf("%f",a);

}

1. int main()

{

int a=65;

printf("%d",a);

}

1. int main()

{

int a=65;

printf("%f",a);

}

Observe the output for the programs from d – g. What is your observation?

(Always remember about the size of memory allocated for both **int** and **float** type)

1. int main()

{

float a=15.123456789;

printf("%e",a);

}

1. int main()

{

float a=15.123456789;

printf("%E",a);

}

1. int main()

{

int a=15;

printf("%o",a);

}

The value of ‘a’ was 15. But it printed 17!! Why is it so?

1. In the same way, try out %x, %X.
2. **Operators**
3. int main()

{

int a,b,c; // A declaration statement. 3 variables are declared.

a=15; // An initialization statement.

b=2; // initializing 'b' with a value 2.

c=a%2;

printf("%d",c);

}

1. Change the data type of a,b,c to float. What is your observation?
2. You know that the relational operators return either **true** or **false** depends on the expression. ‘True’ is represented by 1, and ‘False’ by 0. Try the following. Before executing the program, predict the output and check whether your prediction was correct or not. If you were wrong, try to analyse where you went wrong.

int main()

{

int a=10,b=5,c=5; // Did you notice that both declaration and initialization is done on the same line?

printf("%d\n",a>b);

printf("%d\n",a<b);

printf("%d",b==c);

printf("%d",b<=c);

}

1. **Assignment operator**

int main()

{

int a=10,b=5;

printf("%d\n",a=b); // instead of the comparison operator ==, assignment operator = is used.

printf("a=%d\tb=%d",a,b);

}

1. int main()

{

int a,b,c;

a=b=10; // Notice the initialization. Both 'a' and 'b' is initialized to 10.

c=++a;

printf("\nNow a =%d c=%d",a,c);

c=b++;

printf("\nNow b =%d c=%d",b,c);

}

Try to understand the difference between pre increment operator (++a) and post increment operator(b++).

1. Modify the above program with pre decrement (--a) and post decrement (a--) operators. Before executing, predict the output.
2. Write a program to print the following pattern using 3 printf() statements.

\*

\* \*

\* \* \*

1. Write a program to print the following pattern using only one printf() statements.

\*

\* \*

\* \* \*

1. Write a program to accept two integer numbers from the user and to display its sum.
2. Write a program to accept the length and breadth of a square and to display its area. (The length and breadth can be a real value)
3. Two numbers are input through the keyboard into two locations C and D. Write a program to interchange the contents of C and D.
4. If the marks obtained by a student in five different subjects are input through the keyboard, find out the aggregate marks and percentage of marks obtained by the student. Assume that the maximum marks that can be obtained by a student in each subject are 100.
5. Mr. Kiran’s salary is input through the keyboard. His dearness allowance is 40% of basic salary, and house rent allowance is 20% of basic salary. Write a program to calculate his gross salary.
6. Write a program to calculate simple interest. Accept P, N and R from user. Use float where ever necessary.
7. Write a program which reads in the degrees Fahrenheit from the user and prints out the corresponding degree in Celsius. The conversion formula is : C =(5/9)\*(F – 32).

What would be the data types of the variables holding the values of C and F? What is the difference between the float and double data types?

1. The length and breadth of a rectangle and radius of a circle are input through the keyword. Write a program to calculate the area and perimeter of the rectangle, and the area and circumference of the circle.

**Reading Assignment**

1. Could you find out any difference between the size of **int** and **signed** **int**? Is there any difference in the type of data that can be stored? If the answer for both these questions are ‘No’, what can be the reason for having two separate data types to store the same type of data?
2. Read about **Conditional operators**, **Bitwise operators** and **Comma operators** before the next lab.