Shiv Nadar University

CSD101: Introduction to Computing and Programming

Lab #2

VSC and First C programs

Max marks: 80.
Due on/before:17.00, 4-Sep-2021. 28-Aug-2021

For each problem first type in the given program and check it works correctly, then modify.

1. The **C** program given below implements a slight variant of the VSC problem that we discussed in class to find the larger of two numbers.

```c
#include<stdio.h>
#include<stdlib.h>

int main() {
  int m, n;
  //Read m, n
  printf("Give values of m and n = ");
  scanf("%d%d",&m,&n);
  if (m>n) printf("%d > %d\n",m,n);
  else
    if (m<n) printf("%d > %d\n",n,m);
    else printf("%d = %d\n",m,n);
  exit(0);
}
```

   (a) First change the VSC program we did in class to implement this variant that prints the larger number first then > then the smaller number if they are unequal and prints m = n if they are equal. Try it out on the VSC interpreter (to be released) to ensure that it works correctly.

   (b) Change the **C** program given above so that it now reads three numbers m, n and p and then prints them out first in increasing order and then in decreasing order.

[15,15=30]

2. The **C** program give below is the program that read two numbers m and n and printed the product of the two numbers. It does it by using the multiplication operator '*' and also by repeated addition. Modify the program so that it reads three numbers (say m, n, q) and calculates the product of the three by a) directly using the multiplication operator '*' and b) by repeated addition.

```c
#include<stdio.h>
#include<stdlib.h>

int main() {
  int m, n, p;
  //Read m, n
  printf("Give values of m and n = ");
  scanf("%d%d",&m,&n);
  //Direct calculation using *
  printf("Product = %d\n",m*n);
  //Calculation using repeated addition
  p=0;
  for (int i=1;i<=m;i=i+1)
    p=p+n;
  printf("Product by repeated addition = %d\n",p);
  exit(0);
}
```

[25]

3. The program given below (a problem from lab 1) calculated the GCD of two numbers m, n. Modify the program to calculate the GCD using the remainder operation % instead of subtraction as in the given program. In addition also calculate and print the smallest number ℓ such that both m, n divide ℓ. So, if $m = 64$, $n = 36$ the GCD is 4 and ℓ (also called LCM) is 576.

```c
#include<stdio.h>
#include<stdlib.h>

int main() {
  int m, n;
  //Read m, n
  printf("Give values of m and n = ");
  scanf("%d%d",&m,&n);
  printf("GCD of %d and %d is ",m,n);
  while (m!=n) {
    if (m>n) m=m-n;
    if (n>m) n=n-m;
  }
  printf("= %d\n",m);
  exit(0);
}
```

[25]