Exercise Problems

1. An outline of a C program for computing the maximum of 5 numbers is given below. Fill in the missing parts. Give memory state diagram after each step of execution, when the program is executed giving input: 20 10 30 50 40.

```
#include<stdio.h>
int main()
{
      int a,max;
      printf("Enter the first number\n");
      scanf("%d",&a);
      max = a;
      printf("Enter the second number\n");
      scanf("%d",&a);
      if(a>max)
      {
           max=_____________;
      }
      printf("Enter the third number\n");
      scanf("%d",&a);
      if(a>________)
      {
           max=_____________;
      }
      printf("Enter the fourth number\n");
      scanf("%d",__________);
      if(____________)
      {
           max=_____________;
      }
      printf("Enter the fifth number\n");
      scanf("%d",___________);
      if(____________)
      {
           ------------------
      }
      printf("The largest number is %d \n",max);
      return 0;
}
```

2. Write a program that takes three numbers from user and gives both the maximum of the three numbers and the minimum of the three numbers as results. Can you do this task with only three comparisions and only three variables `a, max, min`? Give memory state diagram after each step of execution, when the program is executed giving input: 20 30 10.

3. An outline of a C program for deciding whether a number is even or odd is given below. Fill in the missing parts. Recall that the operation of taking the remainder of dividing a with b can be expressed as `a % b`.

```
#include<stdio.h>
int main()
{
      int a;
      printf("Enter the number\n");
      scanf("%d",&a);
      if(____________)
      {
           printf("The number is even\n");
      }
      else
      {
           printf("The number is odd\n");
      }
      return 0;
}
```

4. Write a program that takes a number as input and rounds it to the nearest multiple of 10. For example, if the number is 35, the program should output 40 and if the number is 34, the program should output 30. (You may assume that the number entered is positive.) Give memory state diagram after each step of execution of the program, if the input given is 34.

5. An outline of a C program for doing the above task is given below. Fill in the missing parts.

```
#include<stdio.h>
int main()
{
      int a,b,result;
      printf("Enter the number\n");
      scanf("%d",&a);
      b=a%10;
      if(b>=5)
      {
           result=_________________________
      }
      else
      {
           result=_________________________
      }
      printf("The rounded value is %d \n",result);
      return 0;
}
```

6. Suppose you want to write a program to find the sum of n numbers where n is not fixed. That is, you need to do the following: ask the user to input a number n, then ask him/her to give n numbers also as input to the program, and then give the sum of these n numbers as result to the user. Can you write a program for this, using only the tools that we have learned so far?