Ceng 198 Introduction to Programming
Midterm
April 03, 2008 18.00 – 19.50
Good Luck!
Each question is 25 pts.

1. Write a program in order to play the game Game of Guessing.

   - Your program should generate a random number and the user should try to figure out that number.
   - According to the users guess, the program should also direct the user, such as; if the user guesses a number less than the computers number the program should warn the user with a message as; Too low, a little bit higher please.
   - And when the user finds the number the program should print the number of tries that the user did to find the number.

```
Sample Run: (Lets say the computer generates a number: 55)
I have a number, try to guess it: 43
Too low, a little bit higher please: 70
Too high, a little bit lower please: 60
Too high, a little bit lower please: 50
Too low, a little bit higher please: 55
You found the number! Congratulations!
Number of tries = 5
```

   Hints: To generate a random number include the libraries;

```
#include<stdlib.h>
#include<time.h>
```

   And add the following code to your main program;

```
srand(time(0));
number = rand()%XXX
```

```
#include<stdio.h>
#include<stdlib.h>
#include<time.h>
int main(void)
{
  int guess, number, counter;
  srand(time(0));
  number=1+rand()%99;
//   printf("number=%d\n",number);
//   number=55;
  printf("I have a number, try to guess it: ");
  scanf(" %d",&guess);
  counter=1;
  while(guess != number)
    {
      if (guess < number)
printf("Too low, a little bit higher please: ");
      else if (guess > number)
printf("Too high, a little bit lower please: ");
      scanf(" %d",&guess);
      ++counter;
    }
  printf("You found the number! Congratulations!\n");
  printf("Number of tries = %d\n",counter);
  return 0;
}
```

2. One large chemical company pays its salespeople on a commission basis. The salespeople receive $200 per week

   - plus 8 percent (if he/she sold less then $2500 worth of chemicals in a week)
   - or 12 percent (if he/she sold more then $2500 worth of chemicals in a week) of their gross sales for that week.
   - For example, a salesperson who sells $5000 worth of chemicals in a week receives $200 plus 12 percent of $5000, or a total of $800.

   Develop a complete C program that uses any of the repetitive structures to input each salespersons gross sales for last week and calculate and display that salespersons earnings.

```
Sample Run:
Enter sales in dollars (-1 to end): 5000
Salary is: $800.00
```

```
#include<stdio.h>
int main(void)
{
  float sales, earning, base=200.0;
  printf("Enter sales in dollars (-1 to end) : ");
  scanf(" %f",&sales);
  //   printf("sales = %f \n",sales);
  while(sales != -1)
    {
      if (sales <= 2500)
earning=base+sales*8/100;
      else if (sales > 2500)
earning=base+sales*12/100;
      printf("Salary is $%.2f \n",earning);
      printf("Enter sales in dollars (-1 to end) : ");
      scanf(" %f",&sales);
      //   printf("sales = %f \n",sales);
    }
  return 0;
}
```

3. What will be the output of the following program fragment?

```
for( sum=0, i=2; i <= 8; i +=2)
{
  j=i;
  while(j < 4)
  {
      k=j;
      do
      {
          sum++;
          k+=2;
      }while(k <= 3);
      j++;
  }
 printf(" %d %d %d %d \n", sum, i, j, k);
}
```

```
#include<stdio.h>
int main()
{
  int sum,i,j,k;

  for( sum=0, i=2; i <= 8; i +=2)
    {
      j=i;
      while(j < 4)
        {
          k=j;
          do
            {
              sum++;
              k+=2;
            }while(k <= 3);
          j++;
        }
      printf(" %d %d %d %d \n", sum, i, j, k);
    }
  return 0;
}
```

```
 2 2 4 5
 2 4 4 5
 2 6 6 5
 2 8 8 5
```

4. A palindrome is a number or a text phrase that reads the same backwards as forwards. For example, each of the following five–digit integers is a palindrome: 12321, 55555, 45554 and 11611. Write a complete C program that reads in a five–digit integer and determines whether it is a palindrome.
   Hints:

   - Use the division and modulus operators to seperate the number into its individual digits.
   - Store each digit in its own variable.

```
#include<stdio.h>
int main(void)
{
  int i,number, onlar=10,a,b,c,d,e;
  printf("Enter a five-digit integer : ");
  scanf(" %d",&number);
  //   printf("number = %d \n",number);
  a=number%onlar;
  number=number/onlar;
  b=number%onlar;
  number=number/onlar;
  c=number%onlar;
  number=number/onlar;
  d=number%onlar;
  number=number/onlar;
  e=number%onlar;
  printf("a=%d b=%d c=%d d=%d e=%d \n",a,b,c,d,e);
  if(a==e && b==d)
    printf("Entered number %d%d%d%d%d is a palindrome\n",e,d,c,b,a);
  else
    printf("Entered number %d%d%d%d%d is NOT a palindrome\n",e,d,c,b,a);
  return 0;
}
```