Week 3 Lab Tutorial: Functions and Pointers – Assignment Solutions

Q1: (digitValue)

```c
#include <stdio.h>
int digitValue1(int num, int k);
void digitValue2(int num, int k, int *result);
int main()
{
   int num, digit, result;

   printf("Enter the number: \n");
   scanf("%d", &num);
   printf("Enter k digit position: \n");
   scanf("%d", &digit);
   printf("digitValue1(): %d\n",  digitValue1(num, digit));
   digitValue2(num, digit, &result);
   printf("digitValue2(): %d\n", result);
   return 0;
}
int digitValue1(int num, int k)
{
   int i, r;

   for (i=0; i<k; i++)
   {
      r = num%10;
      num /= 10;
   }
   return r;
}
void digitValue2(int num, int k, int *result)
{
   int i, r;

   for (i=0; i<k; i++)
   {
      r = num%10;
      num /= 10;
   }
   *result = r;
}
```

Q2: (power)

```c
#include <stdio.h>
float power1(float num, int p);
void power2(float num, int p, float *result);
int main()
{
   int power;
   float number, result;

   printf("Enter the number and power: \n");
   scanf("%f %d", &number, &power);
   printf("power1(): %.2f\n", power1(number, power));
   power2(number,power,&result);
   printf("power2(): %.2f\n", result);
   return 0;
}
float power1(float num, int p)
{
   float result;
   result = 1;
   if (p == 0)
      return 1;
   else if (p < 0)
      while (p++) result *= 1.0/num;
```

```
   else
      while (p--) result*= num;
   return result;
}
void power2(float num, int p, float *result)
{
   *result = 1;
   if (p == 0)
      *result = 1;
   else if (p < 0)
      while (p++)
         *result *= 1.0/num;
   else
      while (p--)
         *result *= num;
}
```

Q3: (gcd)

```
#include <stdio.h>
int gcd1(int num1, int num2);
void gcd2(int num1, int num2, int *result);
int main()
{
   int x,y,result;
   printf("Enter 2 numbers: \n");
   scanf("%d %d", &x, &y);
   printf("gcd1(): %d\n", gcd1(x, y));
   gcd2(x,y,&result);
   printf("gcd2(): %d\n", result);
   return 0;
}
int gcd1(int num1, int num2)
{
   int rem=1;
   while (1)   {
      rem = num1%num2;
      if (rem==0)
         break;
      else  {
         num1 = num2;
         num2 = rem;
      }
   }
   return num2;
}
void gcd2(int num1, int num2, int *result)
{
   int rem=1;
   while (1)   {
      rem = num1%num2;
      if (rem==0)
         break;
      else  {
         num1 = num2;
         num2 = rem;
      }
   }
   *result = num2;
}
```

Q4: (countOddDigits)

```
#include <stdio.h>
int countOddDigits1(int num);
void countOddDigits2(int num, int *count);
int main()
{
   int number, result;
```

```
   printf("Enter the number: \n");
   scanf("%d", &number);
   printf("countOddDigits1(): %d\n", countOddDigits1(number));
   countOddDigits2(number, &result);
   printf("countOddDigits2(): %d\n", result);
   return 0;
}
int countOddDigits1(int num)
{
   int count = 0;
   while (num != 0)
   {
     if ((num%10)%2 == 1) {
         count += 1;
      }
      num/=10;
   }
   return count;
}
void countOddDigits2(int num, int *count)
{
   *count = 0;
   while (num != 0)
   {
      if ((num%10)%2 == 1) {
         *count += 1;
      }
      num/=10;
   }
}
```