

Electrical Engineering and Information Technology, B.Eng.
Introduction to the C Programming Language: Exercises

Exercise Sheet 10

1. Extend exercise 1 from exercise sheet 8. Write a function
 float ArithMean(float numbers [10]), a function
 float Variance (float m, float numbers [10]) and a function
 float StandDev(float v)
 to compute the arithmetic mean, the variance and the standard deviation.

Then write a function statistic2() which now uses pointers to these 3 functions to compute the statistical values and then exports the computed values.

Info: the technique of passing function pointers in the parameter list of functions is used e.g. in the creation of timers.

2. Assume a sorted array v of int numbers and we have another int number x and we want to know whether x is contained in our sorted array. The way to find out is to use the function binsearch():

```
int binsearch(int x, int v[], int n)
/*****
/* is x in v?
*****/
{
  int low, high, mid;

  low = 0;
  high = n-1;
  while (low <= high) {
    mid = (low + high) / 2;
    if (x < v[mid]) {
      high = mid - 1;
    }
    else if ( x > v[mid] ) {
      low = mid + 1;
    }
    else {
      return mid;
    }
  }
  return -1;
} /* END_binsearch() */
```

a) Write a program and preset an array of 10 sorted int numbers. Read an int x and use binsearch() to find out, whether x is in your array.

b) There is also a recursive version of binsearch(). Try to find it.