Programming Assignment 2:

Vowel Count Using String Operations

Name: Derek (劉哲瑋) Number: D1262032

I first define capacity=512, index=0, i, counts=0, ONE=0, TWO=0, THREE=0, FOUROrMORE=0, and countmore=0 using int data type, and *buffer using char data type, and *dataIn, *dataOut using FILE.

Then, I use the code below to input the file character by character until reaching the end of file.

```
int c;
while(!feof(dataIn)){//input the file character by character until reaching the end of file
    c=fgetc(dataIn);
    if(isalpha(c)){
        if(index==capacity){
            buffer=(char *)realloc(buffer, (capacity+512)*sizeof(char));
            capacity+=512;
        }
        buffer[index++]=toupper(c);
    }
}
buffer[index]='\0';
```

Next, I open "result.txt" and write the file using fwrite(). Then I print the first 800 characters of the input text by using a for loop.

Then I use the code below to count the number of one character letter, two contiguous character letters, three contiguous character letters, and four or more contiguous character letters.

```
48      i=0;
49      while(buffer[i]!='\0'){//count the number of contiguous letters
50          if(buffer[i]==buffer[i+1]){
51              if(buffer[i+1]==buffer[i+2]){
52                  if(buffer[i+2]==buffer[i+3]){
53                      FOURorMORE++;
54                      counts+=4;
55                      for(i=i+3;i<index;i++){//check it whether over four contiguous characters
56                          if(buffer[i]!=buffer[i+1]){break;}
57                          countmore++;
58                      }
59                      counts+=countmore;
60                  }
61                  else{ THREE++; i=i+2; counts+=3;}
62              }
63              else{TWO++; i=i+1; counts+=2;}
64          }
65          else {ONE++; counts+=1;}
66          i++;
67      }
```

Next, I define count_A=0, count_E=0, count_I=0, count_O=0, count_U=0, total_vowel_count=0 using int data type and define vowel[]="AEIOU" and *ptr using char data type. Then, I use a for loop and a while loop to count the number of each occurrence of vowels, 'A', 'E', 'I', 'O', and 'U'.

```
75      int count_A=0, count_E=0, count_I=0, count_O=0, count_U=0, total_vowel_count=0;
76      char vowel[]="AEIOU";
77      for(i=0;vowel[i]!='\0';i++){
78          char *ptr=buffer;
79          if(i==0) ptr=strpbrk(ptr, "A");
80          else if(i==1) ptr=strpbrk(ptr, "E");
81          else if(i==2) ptr=strpbrk(ptr, "I");
82          else if(i==3) ptr=strpbrk(ptr, "O");
83          else if(i==4) ptr=strpbrk(ptr, "U");
84          while(ptr!=NULL){
85              total_vowel_count++;
86              if(i==0) { count_A++; ptr=strpbrk(ptr+1, "A"); }
87              else if(i==1) { count_E++; ptr=strpbrk(ptr+1, "E"); }
88              else if(i==2) { count_I++; ptr=strpbrk(ptr+1, "I"); }
89              else if(i==3) { count_O++; ptr=strpbrk(ptr+1, "O"); }
90              else if(i==4) { count_U++; ptr=strpbrk(ptr+1, "U"); }
91          }
92      }
```

Finally, I use “free()” to release memory space of buffer[].