MINIPROJECT REPORT

# SURPASSING WORD PROGRAM

1. **Problem statement**

* Surpassing words are English words for which the gap between each adjacent pair of letters strictly increases. These gaps are computed without “wrapping around” from Z to A
* Take an input string from user then check if it is a surpassing word or not

1. **Used labels & registers in main**
   1. **Labels**

string: input string of maximum length 100

length: store length of input string

i1: counter index, default = 0

i2: counter index, i2 = i1 + 1

last\_gap: latest difference of ASCII value between 2 characters

isValid: default = 1, becomes 0 if a word is not surpassing

validMessage: “ is a surpassing word” is displayed when input string is surpassing

invalidMessage: “ is not a surpassing word” is displayed when input string is not surpassing

* 1. **Registers**

$v0: contains length value, syscall purpose

$t0: contains value of i1 in register

$t1: counter minus length for range in for-loop

$t9: contains value to store in i2, $t9 = i1 + 1

1. **Function’s Algorithm**
   1. **main**

* initialize last\_gap = -1, isValid = 1 (true)
* get input string from user
* get the length of the input string by using “getLengthLabel” function (miniprojectUtils.asm)
* for-loop to scan all characters in input string from beginning to the last character (from i = 0 to length(string)-2), inside for-loop:

+ call “getAddressAtIndex” function to get character string[i] and string[i+1]

+ call “getCharDistance” to get distance ASCII value between string[i] and string[i+1]

+ compare distance(a[i], a[i+1]) and last\_gap

+ if distance(a[i], a[i+1]) > last\_gap, update last\_gap = distance(a[i], a[i+1])

+ else break the loop and return isValid = 0

* print the string and show if it is a surpassing word or not by using value inside “isValid”
  1. **getLengthLabel(%label)**
  2. **getAddressAtIndex(%str, %index)**
  3. **getCharDistance(%register\_1, %register\_2)**

*Please read MINIPROJECT SUBPROGRAM CATALOG for details of these 3 subprograms.*

1. **Pseudocode**

string str; (input)

int latestDiff = -1;

int flag = 1;

for (int i = 0 ; i < n-1 ; i++){

char x = str[i];

char y = str[i+1];

if (abs(y-x) > latestDiff){

latestDiff = abs(y-x)

}

else{

flag = 0;

break;

}

}

if (flag == 0)

printf("is\_surpassing\_word(\"%s\") # => False", str);

else printf("is\_surpassing\_word(\"%s\") # => True", str);