



MARMARA UNIVERSITY
FACULTY OF ENGINEERING
COMPUTER ENGINEERING DEPARTMENT
CSE3038
COMPUTER ORGANIZATION
PROJECT 1 REPORT

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Welcome to our MIPS Project!
Main Menu:
1.Square Root Approximate
2.Matrix Multiplication
3.Palindrome
4.Exit
Please select an option : 1

```

In the menu part, program jumps to the related part of the code depends on users choice;

Case 1 : Square Root Approximation

Case 2 : Matrix Multiplication

Case 3 : Palindrome check of some given string

Case 4 : End the program

CASE1

```

Welcome to our MIPS Project!
Main Menu:
1.Square Root Approximate
2.Matrix Multiplication
3.Palindrome
4.Exit
Please select an option : 1
Enter the number of iteration for the series : 5
a : 1 3 7 17 41
b : 1 2 5 12 29

```

Example run in Project pdf

```

Main Menu:
1.Square Root Approximate
2.Matrix Multiplication
3.Palindrome
4.Exit
Please select an option : 1
Enter the number of iteration for the series : 12
a : 1 3 7 17 41 99 239 577 1393 3363 8119 19601
b : 1 2 5 12 29 70 169 408 985 2378 5741 13860

```

Arbitrary run

- ➔ First elements of array a and b are set to 1.
- ➔ Until the program reaches the entered iteration number repeats the procedure.
- ➔ Initial value of b added to the initial value of a and stored in the next element of b.
 $Z = A(n) + B(n)$
 $B(n+1) = Z$
- ➔ Initial value of b added to Z and stored in the next element of a.
 $Z = Z + B(n)$
 $A(n+1) = Z$
- ➔ Print arrays of a and b.

CASE 2

```
Main Menu:
1.Square Root Approximate
2.Matrix Multiplication
3.Palindrome
4.Exit
Please select an option : 2
Enter the first matrix: 3 7 8 12 5 6 7 2 4 3 2 5
Enter the second matrix: 2 5 6 3 7 8 9 1
Enter the first dimension of first matrix: 3
Enter the second dimension of the first matrix: 4

Matrix Multiplication :
212 112
113 101
85 50
```

Example run in Project pdf

```
Main Menu:
1.Square Root Approximate
2.Matrix Multiplication
3.Palindrome
4.Exit
Please select an option : 2
Enter the first matrix: 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Enter the second matrix: 20 21 22 23 24 25 26 27 28 29 30 31
Enter the first dimension of first matrix: 5
Enter the second dimension of the first matrix: 3

Matrix Multiplication :
800 833 866 899
1016 1058 1100 1142
1232 1283 1334 1385
1448 1508 1568 1628
1664 1733 1802 1871
```

Arbitrary run

- ➔ Fill the two matrices with the loop by converting characters into the integers by subtract them with 48.
- ➔ Calculate the number of elements that will be used in transaction with the help of entered dimensions.
(Multiply Number of elements in a row in first matrix with number of elements in a column in second matrix)
- ➔ Loop turns up to number of elements in the solution matrix.
- ➔ Since the same row is taken in first matrix, elements are taken consecutively.
(a [0], a [1], a [2], ...)
- ➔ Since the same column is taken in second matrix, address of array incremented by (4 * column number of second matrix) for each element in column.
(b [0], b [0 + 1 * column], b [0 + 2 * column], ...)
(b [1], b [1 + 1 * column], b [1 + 2 * column], ...)
- ➔ When the destination element's row changes, take the next row of first matrix; when the destination element's column changes take the next reference column of the second matrix (if necessary, do mod operation).
For s0 take first matrix first row and second matrix first column.
For s1 take first matrix first row and second matrix second column.
- ➔ Elements multiplied in order and added to the related solution matrix's element which are in selected row and column.
(s [0] = a [0] * b [0] + a [1] * b[column])
- ➔ Print solution matrix.

CASE 3

```
Main Menu:
1.Square Root Approximate
2.Matrix Multiplication
3.Palindrome
4.Exit
Please select an option : 3
Enter an input string : abGcdEEedcgba
```

abGcdEEedcgba is palindrome.

```
Welcome to our MIPS Project!
Main Menu:
1.Square Root Approximate
2.Matrix Multiplication
3.Palindrome
4.Exit
Please select an option : 3
Enter an input string : step on ab no pets

step on ab no pets is not palindrome.
```

```
Main Menu:
1.Square Root Approximate
2.Matrix Multiplication
3.Palindrome
4.Exit
Please select an option : 3
Enter an input string : Ey Edip ADANada PiDe Ye

Ey Edip ADANada PiDe Ye is palindrome.
```

```
Main Menu:
1.Square Root Approximate
2.Matrix Multiplication
3.Palindrome
4.Exit
Please select an option : 3
Enter an input string : step on no pets

step on no pets is palindrome.
```

- ➔ Count the characters in string.
- ➔ Enter a for loop till the reach the half of the string.
- ➔ Take two character one from begin and one from end.
- ➔ Compare two characters ;
 - if two characters are same (case insensitive) continue loop.
 - If not break the loop and print “is not palindrome ” case.
- ➔ If comparison loop finishes succesfully print “is palindrome ” case.

CASE 4

```
Main Menu:
1.Square Root Approximate
2.Matrix Multiplication
3.Palindrome
4.Exit
Please select an option : 4
Program ends. Bye :)
```

- ➔ Case 4 terminates program.