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1	N-HW	Project	Work title
	presentation	2021/12/24	Submission date

In the name of god

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Project: vending machine

Class: assembly

- **Over view:**

  In this project we implement Vending machine with AVR and Proteus .

  After User Enter the password as a default password is (176),

  LCD show some Items with and it's price to user and user see the price and select the Items by push KEY (on/c) and finally , accept and finish his buying and LCD show user the Total cost.

  Notice:

  If User doesn't enter write password , he couldn't continue,

  User can delete the password that entered by clicking the (C) bottom.

  IF User enter more than 3 digits or wrong password :

  LCD shows message to him that is : (wrong password) then (try again)

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User can changes the list by two ways :

1-

Use bottoms (+ or -), if push these bottoms , LCD will show the next or previous Items.

2-

Use bottoms (1 , 2 , …. , 9) , if push each number , LCD will show the Items with number that ordered in list.

Two Seven segments:

When user select an Items , seven segment will increase number that shows the number of selected items.

Statements :

if user push key (+) for 10 times , LCD will show the list from the start (0),

Because it implements like state machine .

ADVICE / IDEA:

It can be promoted by adding this option : UNSELECT ITEMS BY USER

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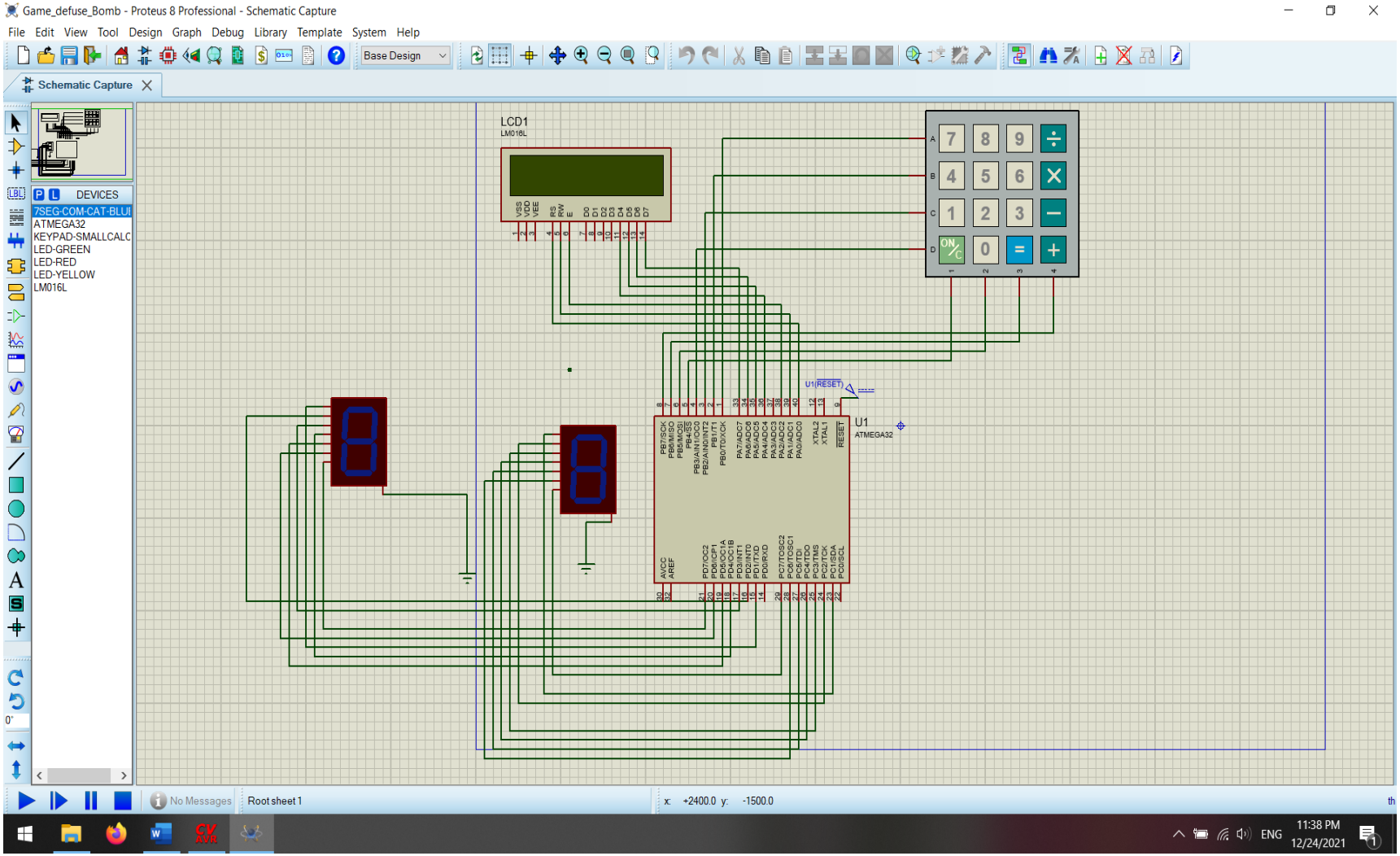
- **View of proteus :**



موفق باشید-علی صادق

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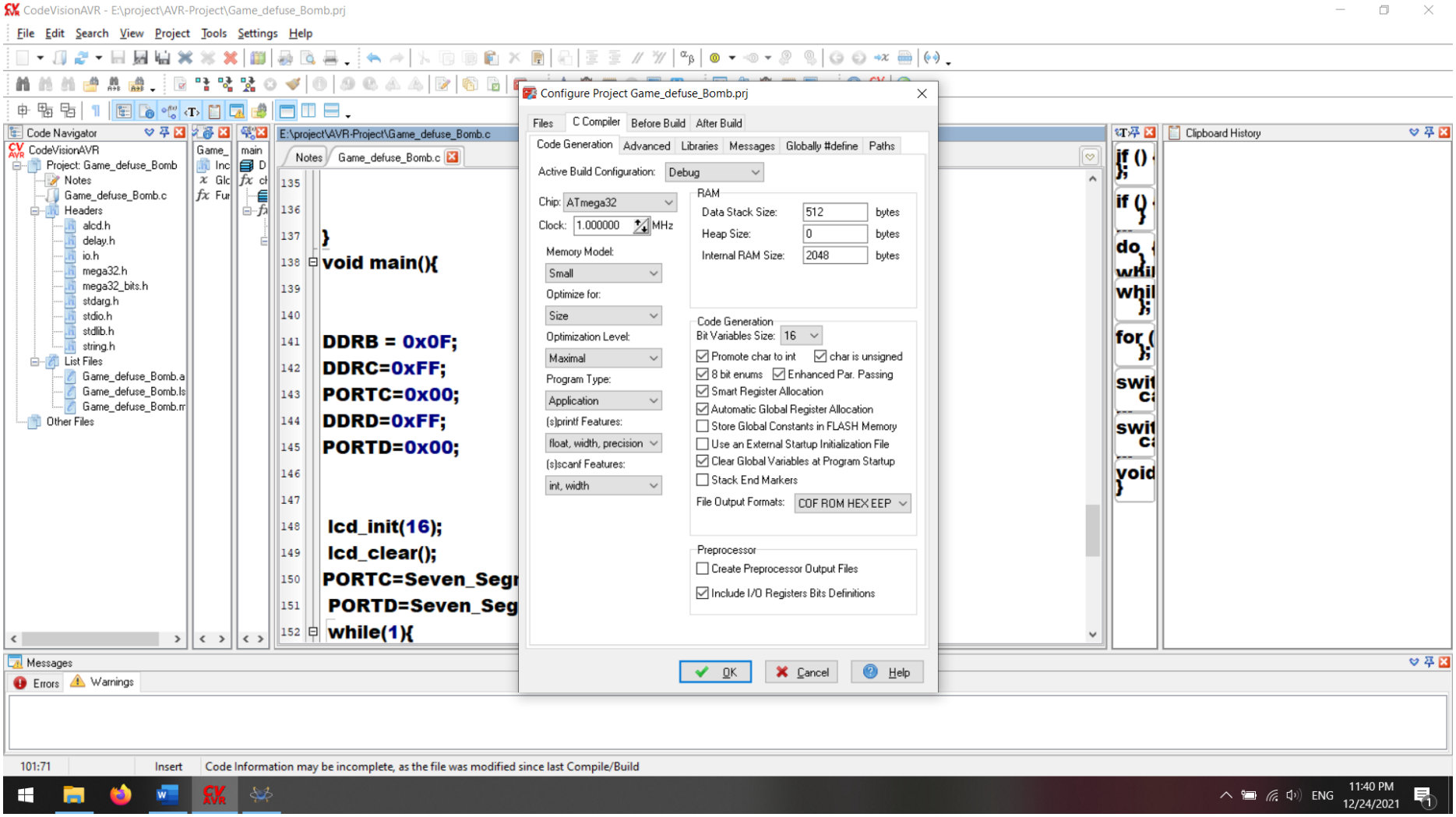
- **Requirement:**



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- **Source code AVR:**

```
#include <io.h>
#include <mega32.h>
#include <delay.h>
#include <alcd.h>
#include <string.h>
 #include <stdio.h>
 #include <stdlib.h>

char key= '0';
char Key;
float total = 0;
int state = 0;
char Buf1[32];
char Buf[16];
int Num1=0;


int row ;
int col;
```

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```
char scan [4] = {0XFE,0XFD,0XFB,0XF7};

char list [10][16] = { "0- crisp" , "1- water" , "2- pepsi" , "3- coca" , "4- chips" , "5- crisp" , "6-
soda" , "7- cold tea" , "8- Ice cream" , "9- pop corn"};
float price[10] = {3 , 1.5 , 2 , 2.5 , 2 , 4 , 1 , 5 , 4.5 , 2};
char keypad [4][4] = { {'7','8','9',' '},{'4','5','6',' '},{'1','2','3','-'},{'c','0','=','+'}};
char Data=0;
char Data2=0;
char Seven_Segment(char Input_Data){
 char K;
 switch (Input_Data){
 case 0: K=0x7E; return K; break;
 case 1: K=0x0C; return K; break;
 case 2: K=0xB6; return K; break;
 case 3: K=0x9E; return K; break;
 case 4: K=0xCC; return K; break;
 case 5: K=0xDA; return K; break;
 case 6: K=0xFA; return K; break;
 case 7: K=0x0E; return K; break;
 case 8: K=0xFE; return K; break;
```

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```
case 9: K=0xDE; return K; break;
default: K=0x00; return K; break;}
}
char key_pad(){

    while(1){
      for(row=0; row <=3; row++){

        PORTB = scan[row];

        col = 5;

        if(PINB.4 ==0){
          col = 0;
        }
        if(PINB.5 ==0){
          col = 1;
        }
        if(PINB.6 ==0){
          col = 2;
```

```
            }
            if(PINB.7 ==0){
              col = 3;
            }

            if(col != 5){

             delay_ms(200);
              return keypad[row][col];
            }
          }
    }

}
int result(){
              lcd_clear();
               lcd_gotoxy(0,0);
               lcd_puts("Total cost :");
               lcd_gotoxy(0,1);
               sprintf(Buf ,"%.1f $", total);
```

```
                lcd_puts(Buf);
                return 1;
}
void newState(){
   lcd_clear();
   lcd_gotoxy(0,0);

   lcd_puts(list[state]);
   lcd_gotoxy(0,1);
   sprintf(Buf,"%.1f $", price[state]);
   lcd_puts(Buf);

}
int checking(){

    if(key == '='){
        return result();
    }
    else if(key == 'c'){
        total += price[state];
```

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```
            Data++;
            if(Data == 10){
              Data = 0;
              Data2++;
            }
            PORTC=Seven_Segment(Data);
            PORTD=Seven_Segment(Data2);
      }
      else if(key == '+'){
          state++;
          if (state == 10){
              state = 0;
          }
          newState();
      }
      else if(key == '-'){
          state--;
          if (state == -1){
              state = 9;
          }
```

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```
      newState();
    }
    else if(key >= '0' && key <= '9'){
      state = key - '0' ;
      newState();
    }
   else{
   lcd_clear();
   lcd_gotoxy(0,0);

   lcd_puts(list[state]);
   lcd_gotoxy(0,1);
   sprintf(Buf,"%.1f $", price[state]);
   lcd_puts(Buf);

    }



}
```

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```
int getPass(){
int digits = 0;

        while(1){
        Key = key_pad();
        if(Key=='c'){
         Num1 = 0;
         digits = 0;
        }
        else if(Num1 == 176){
              return 176;
        }
        else if(digits < 3){
        Num1 = Num1 * 10 + Key - 48;
        digits++;
        sprintf(Buf1,"%d",Num1);
        lcd_puts(Buf1) ;
        delay_ms(500);
        lcd_clear();
        }
```

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```
        else{
        lcd_puts("Wrong Password");
        delay_ms(1000);
         lcd_clear();
         lcd_puts("Try again");
         delay_ms(1000);
         lcd_clear();
         Num1 = 0;
         digits = 0;
           }
         }
}
int checkPass(){
   int Password = 176;
   int gotPass = 0;
   lcd_clear();
   lcd_gotoxy(0,0);
   lcd_puts("Enter Password");
   delay_ms(2000);
   lcd_clear();
```

```
   lcd_gotoxy(0,0);
   gotPass = getPass();

   if(Password == gotPass){
      return 0;
   }
   return  1;
}

void main(){
int userState = 0;
DDRB = 0x0F;
DDRC=0xFF;
PORTC=0x00;
DDRD=0xFF;
PORTD=0x00;


 lcd_init(16);
 lcd_clear();
```

```
PORTC=Seven_Segment(Data);
 PORTD=Seven_Segment(Data2);
 while(1){
 if (userState == 0){
        if(0 == checkPass()){
              userState++;
        }
 }
if ( userState == 1 ){
 checking();
 key = key_pad();
}

 }
 }
```

- **Source files (contains VIDEO of execution) :**
  https://github.com/aminallahrabi/Microprocessor-Laboratory