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In the name of god

Mohammad.amin.allahrabi

97213002

Project: vending machine

Class: assembly

- **Over view:**

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

  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.

  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:

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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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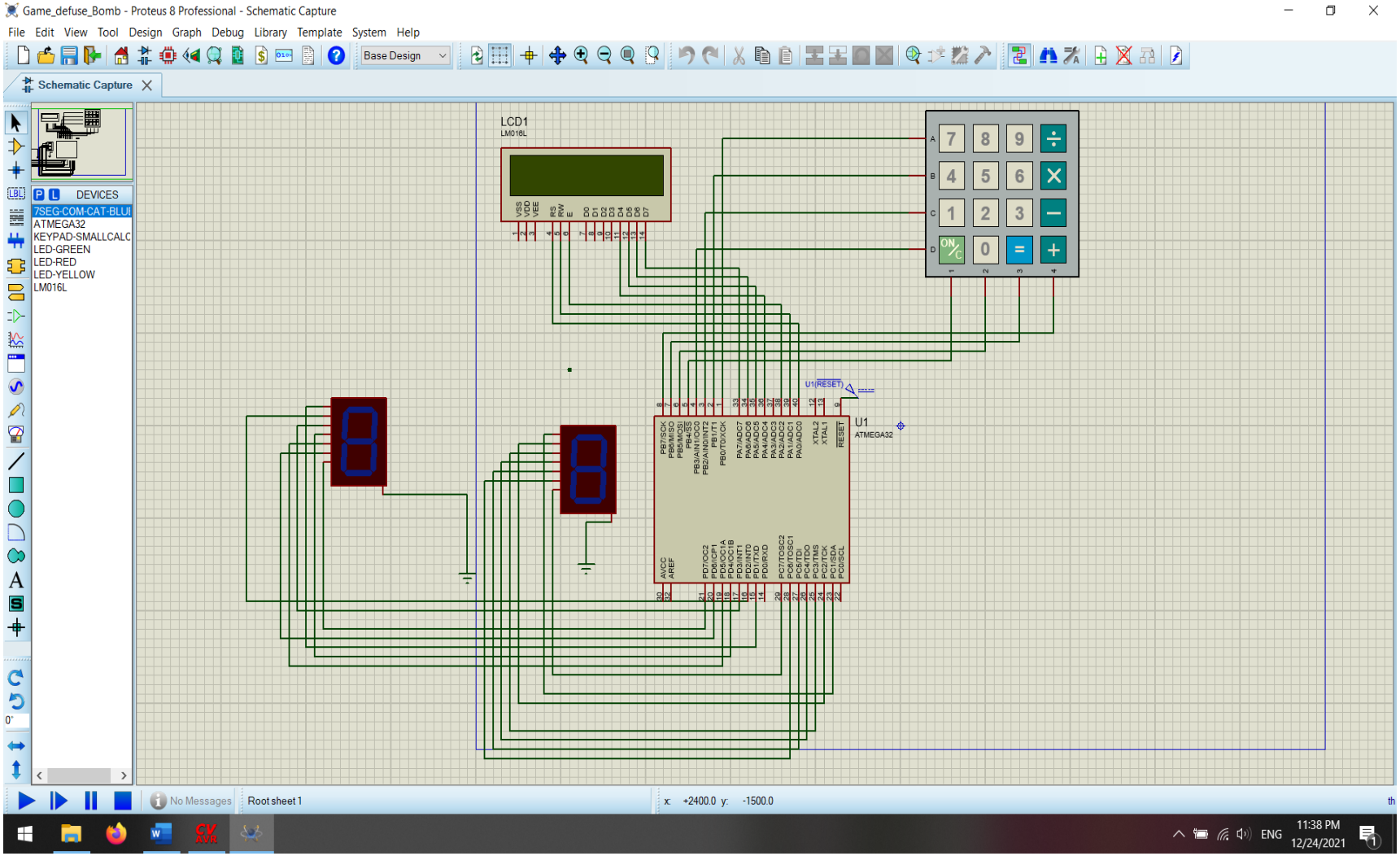
- **View of proteus :**



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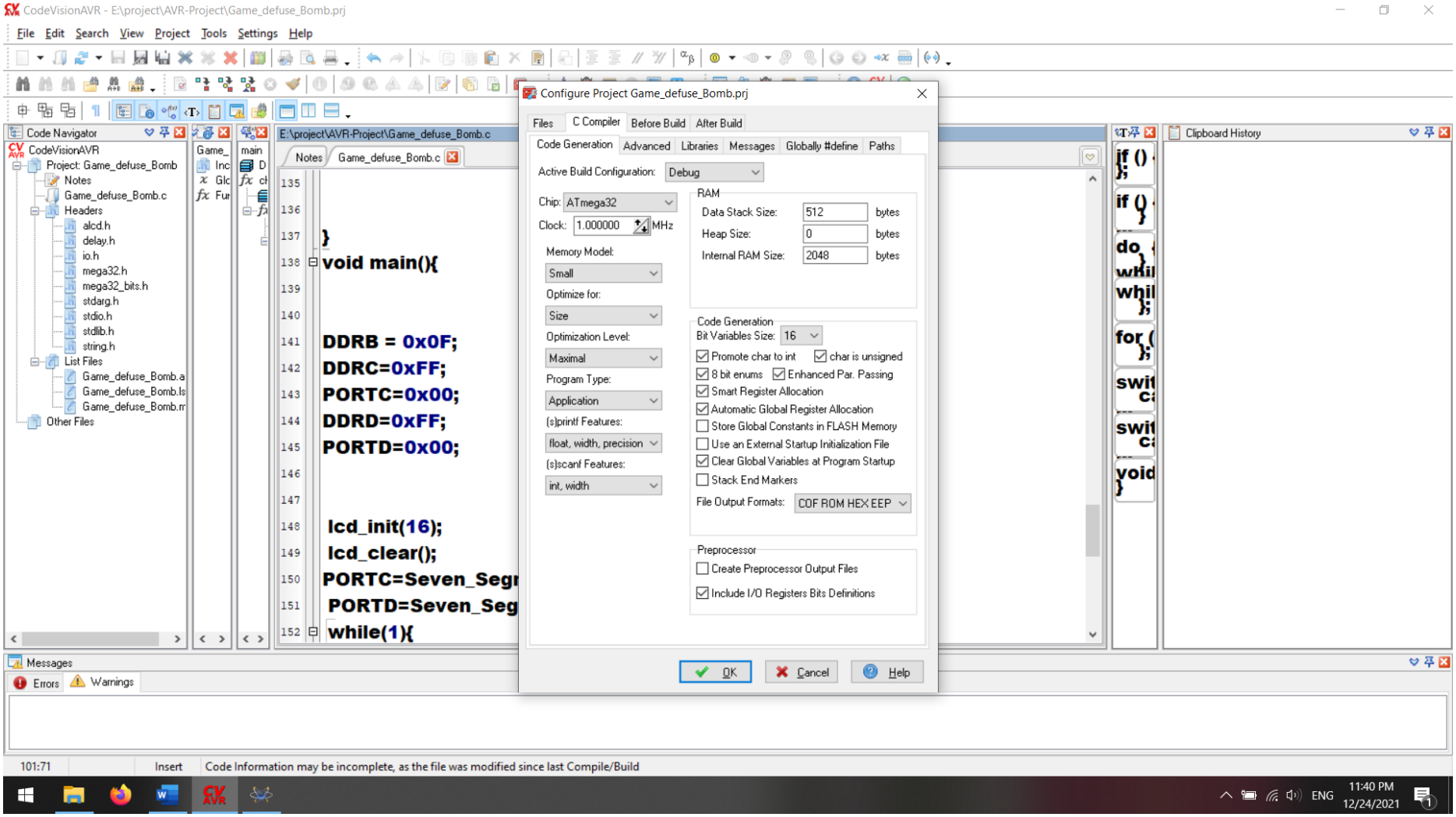
- **Requirement:**



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- **Source code AVR:**

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

char key= '0';
float total = 0;
int state = 0;
char Buf[16];


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

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```
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;
 case 9: K=0xDE; return K; break;
 default: K=0x00; return K; break;} }
```

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```
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(250);
             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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```
void main(){


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){
 checking();
 key = key_pad();

 }
 }
```

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- **Source files :**
  https://github.com/aminallahrabi/Microprocessor-Laboratory