

CS3514 Laboratory Session:

Name: **Nathan Crowley**

Student ID: **118429092**

Repeat the following sections for each question

Question Number: **Play Lotto**

Answer:

-----Report-----

I start by setting a *define* function that will compute the size of a given array. This will be used later in the code to loop through the lotto numbers array.

Then I declare *variables*.

- **lotto_Numbers** = an array of long data type, used to store the lotto numbers.
- **random_Number** = stores the randomly generated number between 1-42, returned by random().
- **time_passed** = the amount of milliseconds since the program began. I use this to determine if ten seconds has passed.
- **seconds** = how often do you want to print lotto numbers array.

In my *setup function* I begin the Serial monitor and set random seed to analog pin 0.

In my *loop function* I begin with setting a one second delay for each iteration of the loop.

Then I calculate the time passed since program began and divide and modulus divide to see if it has been a multiple of 10 seconds yet. If it has been 10 seconds then call a function to generate and print an array of 6 lotto numbers.

Otherwise print how many seconds has passed.

Fucntion to generate and print 6 lotto numbers.

Generate 6 random integers between 1-42 with a while loop that each iteration generates the number and adds it to the array.

Then I print the array to the Serial monitor.

-----Code-----

```
#define ARRAY_SIZE(arr) sizeof(arr)/sizeof(arr[0])

long lotto_Numbers[6];           //initates array of size 6 of all 0's.
long random_Number;             //random number to be appended to
lotto array.

unsigned long time_passed;       //millis() returns unsigned long.
long seconds=10;                /***must use a long when doing
calculation operations on another long!!!!

void setup(){
  Serial.begin(9600);           //begin serial monitor at bit rate of 9600
bits per second.
  randomSeed(analogRead(0));
  /* if analog input pin 0 is unconnected, random analog
noise will cause the call to randomSeed() to generate
different seed numbers each time the sketch runs.
randomSeed() will then shuffle the random function.
*/
}

void loop(){
  delay(1000);
  random_Number = random(1,43);  //43(not 42) because
random(min,max) loops up to max-1

  time_passed = millis();        //return how long has passed since
program began in milliseconds
  time_passed = time_passed/1000; //divide this by ten seconds (1000)
to convet to 1.2345.
  time_passed = time_passed%seconds; //modulus divide to calculate
if its divisable by 10 (seconds).
  if(time_passed == 0){
    //call function that prints lotto array
    printTicket(lotto_Numbers,ARRAY_SIZE(lotto_Numbers));
  }else(Serial.println(time_passed));
}

//function to print lotto array
void printTicket(long array_Input[],int arraySize){
  //generate 6 random numbers
```

```

for(int i = 0; i < arraySize; i++){
    //generate random number
    random_Number = random(1,43); //43(not 42) because
    random(min,max) loops up to max-1
    //append to lotto array
    array_Input[i] = random_Number;
}
//print array
Serial.print("Lotto_Numbers: [");
for (int i = 0; i < arraySize -1; i++){
    Serial.print(array_Input[i]);
    Serial.print(",");
}
Serial.print(array_Input[arraySize-1]);
Serial.println("]");
}

```

-----Photos-----

The screenshot shows the Arduino IDE interface. The left pane displays the code for 'Play_Lotto_C_'. The right pane shows the serial monitor output for the 'dev/ttyACM0' port, displaying the generated lotto numbers in an array format.

Code in Arduino IDE:

```

// Play_Lotto_C_
// ****must use a long when doing calculation operations on another long
long seconds=10;

void setup(){
  Serial.begin(9600); //begin serial monitor at bit rate of 9600 bits per second.
  randomSeed(analogRead(0));
  /* If analog input pin 0 is unconnected, random analog
  noise will cause the call to randomSeed() to generate
  different seed numbers each time the sketch runs.
  randomSeed() will then shuffle the random function.
  */
}

void loop(){
  delay(1000);
  time_passed = millis(); //return how long has passed since program began in milliseconds
  time_passed = time_passed/1000; //divide this by ten seconds (1000) to convert to 1-2345.
  time_passed = time_passed*seconds; //modulus divide to calculate if its divisible by 10 (seconds)
  if(time_passed == 0){
    //call function that prints lotto array
    printTicket(lotto_Numbers,ARRAY_SIZE(lotto_Numbers));
  }else{Serial.println(time_passed);}
}

//function to print lotto array
void printTicket(long array_Input[],int arraySize){
  //generate 6 random numbers
  for(int i = 0; i < arraySize; i++){
    //generate random number
    random_Number = random(1,43); //43(not 42) because random(min,max) loops up to max-1
    //append to lotto array
    array_Input[i] = random_Number;
  }
  //print array
  Serial.print("Lotto_Numbers: [");
  for (int i = 0; i < arraySize -1; i++){
    Serial.print(array_Input[i]);
    Serial.print(",");
  }
  Serial.print(array_Input[arraySize-1]);
  Serial.println("]");
}

```

Serial Monitor Output:

```

Lotto_Numbers: [36,28,37,10,9,10]
Lotto_Numbers: [7,33,12,27,11,2]
Lotto_Numbers: [19,4,2,34,13,40]
Lotto_Numbers: [1,26,37,1,19,30]
Lotto_Numbers: [39,25,17,27,38,2]
Lotto_Numbers: [30,26,13,6,12,41]

```

Done uploading.
Sketch uses 2658 bytes (8%) of program storage space. Maximum is 32256 bytes.
Global variables use 236 bytes (11%) of dynamic memory, leaving 1812 bytes for local variables. Maximum is 2048 bytes.

53 Arduino Uno on /dev/ttyACM0

Autoscroll Show timestamp Newline 9600 baud Clear output