Arduino C++ Programming

Advanced Concepts

do…while()

Example Code

```
int x = 0;
do {
  delay(50);           // wait for sensors to stabilize
  x = readSensors();   // check the sensors
} while (x < 100);
```

while()

Example Code

```
var = 0;
while (var < 200) {
  // do something repetitive 200 times
  var++;
}
```

for()

Example Code

```
// Dim an LED using a PWM pin
int PWMpin = 10;  // LED in series with 470 ohm resistor on pin 10

void setup() {
  // no setup needed
}

void loop() {
  for (int i = 0; i <= 255; i++) {
    analogWrite(PWMpin, i);
    delay(10);
  }
}
```

break;

```
int threshold = 40;
for (int x = 0; x < 255; x++) {
  analogWrite(PWMpin, x);
  sens = analogRead(sensorPin);
  if (sens > threshold) {      // bail out on sensor detect
    x = 0;
    break;
  }
  delay(50);
}
```

continue;

```
for (int x = 0; x <= 255; x ++) {
  if (x > 40 && x < 120) {  // create jump in values
    continue;
  }

  analogWrite(PWMpin, x);
  delay(50);
}
```

Questions and Exercises (solve all the following problems inside the setup() function)

1. Write a program that prints the numbers from 1 to 10.
2. Write a program to calculate the sum of the numbers from 1 to 10.
3. Write a program that will keep asking for a word, printing it back out and then stop when the word “end” is entered.
4. Using a do…while() loop print out the multiplication table from 1 to n. Ask the user for n.
5. Use a for loop and the continue statement to print out all the even numbers from 2 to 100.
6. Using a for loop and the break statement ask the user for 5 numbers and print them back out. If -1 is entered then stop immediately.

1. Write a program that prints the numbers from 1 to 10.

```
Serial.begin(9600);

 for (int i=1; i<=10; i++){
   Serial.println(i);
 }
```

2. Write a program to calculate the sum of the numbers from 1 to 10.

```
Serial.begin(9600);
  int sum = 0;

  for (int i=0; i<=10; i++){
    sum+=i;
  }

 Serial.println(sum);
```

3. Write a program that will keep asking for a word, printing it back out and then stop when the word “end” is entered.

```
Serial.begin(9600);
 String word = "";

 while (word!="end"){
   Serial.println("Enter a word: ");
   while(Serial.available()==0){}
   word = Serial.readString();
   Serial.println(word);
 }
```

4. Using a do…while() loop print out the multiplication table from 1 to n. Ask the user for n.

```
Serial.begin(9600);
  String word = "";

  Serial.println("Enter a number: ");
  while(Serial.available()==0){}
  int num = Serial.parseInt();
  int i = 0;

  do{
    i++;
    Serial.println(i*num);
  } while (i<num);
```

5. Use a for loop and the continue statement to print out all the even numbers from 2 to 100.

```
Serial.begin(9600);

 for (int i=2; i<=100; i++){
   //skipping odd nums
   if (i%2!=0)
     continue;

   Serial.println(i);
 }
```

6. Using a for loop and the break statement ask the user for 5 numbers and print them back out. If -1 is entered then stop immediately.

```
Serial.begin(9600);

  for (int i=0; i<5; i++){
    Serial.println("Enter number: ");
    while(Serial.available()==0){}
       int num = Serial.parseInt();
    if (num==-1)
      break;
       Serial.println(num);

  }
```