Midterm No. 1 Test Skill	
Course Code: 201L	**Program:** Bachelor of Science in Computer Engineering
Course Title: Data Structures and Algorithms Laboratory	**Date Performed:** 9/6/2025
Section: BSCpE 2A	**Date Submitted:** 9/6/2025
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1. Objectives

- To have knowledge about array and its uses.
- Write a program using array method or functions.
- Allow the program to determine the even integers of a number.

2. Discussion

Array is a linear data structure that store data with the same data types. It is a collection of items stored at contiguous memory locations. In addition, Array is simpler to determine each element's position. Array behave like list except that they contain constrained and they are faster and use lesser memory space.

3. Materials and Equipment

- **Desktop/Device:** It is important to have a device so you can program
- **Operating System:** Operating system are essential since you cannot use your device without it.
- **Python IDE:** You may use Visual Studio Code, Pycharm, Google Colab, or any other Python IDE.

4. Procedure

- Create a file that has name "Midterm-TestSkill.py"
- Import array as arr
- Create your main function
- Assigned array
  arr.typecodes
  num = arr.array("i", [ ])
- This are the sample code:

```
import array as arr

def main():
   arr.typecodes
   num = arr.array('i', [i for i in range(20, 50) if i % 2 == 0])
   print(num)
   x = True
   while x:
```

```
        print("""\nMenu:
1. Display Even Numbers.
2. Display Maximum Number.
3. Display Minimum Number.
4. Reverse Array.
5. Exit.""")
        choice = int(input("Enter your Choice (1-5): "))
        if choice == 1:
            display_even(num)
        elif choice == 2:
            display_max(num)
        elif choice == 3:
            display_min(num)
        elif choice == 4:
            reverse_array(num)
        elif choice == 5:
            print("\nExiting the program...")
            x = False
        else:
            print("Invalid Choice. Choose between 1-5.")

def display_even(num):
    print("\nEven Numbers in the Array: ")
    for n in num:
        if n % 2 == 0:
            print(n)

def display_max(num):
    if len(num) == 0:
        print("Array is empty. No maximum value.")
    else:
        max_num = num[0]
        for i in num:
            if i > max_num:
                max_num = i
        print(f"\nMaximum Number in the Array: {max_num}")

def display_min(num):
    if len(num) == 0:
        print("Array is empty. No minimum value.")
    else:
        min_num = num[0]
        for i in num:
            if i < min_num:
                min_num = i
        print(f"\nMinimum Number in the Array: {min_num}")
```

```
def reverse_array(num):
    print("\nArray in Reverse Order: ")
    for i in range(len(num)-1, -1, -1):
        print(num[i])

if __name__ == "__main__":
    main()
```

5. Output

```
array('i', [20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48])

Menu:
1. Display Even Numbers.
2. Display Maximum Number.
3. Display Minimum Number.
4. Reverse Array.
5. Exit.
Enter your Choice (1-5): 1

Even Numbers in the Array:
20
22
24
26
28
30
32
34
36
38
40
42
44
46
48
```

Figure 1.0 Display the elements

```
array('i', [20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48])

Menu:
1. Display Even Numbers.
2. Display Maximum Number.
3. Display Minimum Number.
4. Reverse Array.
5. Exit.
Enter your Choice (1-5): 2

Maximum Number in the Array: 48
```

Figure 2.0 Find the maximum element

```
array('i', [20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48])

Menu:
1. Display Even Numbers.
2. Display Maximum Number.
3. Display Minimum Number.
4. Reverse Array.
5. Exit.
Enter your Choice (1-5): 4

Array in Reverse Order:
48
46
44
42
40
38
36
34
32
30
28
26
24
22
20
```

Figure 3.0 Reverse the Array

The program shows that the array can be used to determine the even integers of a certain number like for this problem less than 50 but not less than 20. It demonstrates how array can be used to arrange the data.

6. Conclusion

In conclusion array has a lot of applications in data structure and algorithms. This linear data structure uses lesser memory space since it items stored at contiguous memory locations, making it easier to access. What I learned in this laboratory is the syntax of array which is arr.array('i', [ ]) and it uses the same data types so you have to determine it type codes which is 'i' of integer and its syntax is "array.typecodes".

Lab Activity Rubric

Criteria	Ratings						Pts
SO 7 PI 1 **Student Outcome 7.1** Acquire and apply new knowledge from outside sources. threshold: 4.8 pts	6 pts Excellent | Educational interests and pursuits exist and flourish outside classroom requirements,knowledge and/or experiences are pursued independently and applies knowledge learned into practice	5 pts Good | Educational interests and pursuits exist and flourish outside classroom requirements,knowledge and/or experiences are pursued independently	4 pts Satisfactory | Look beyond classroom requirements, showing interest in pursuing knowledge independently	3 pts Unsatisfactory | Begins to look beyond classroom requirements, showing interest in pursuing knowledge independently	2 pts Poor | Relies on classroom instruction only	1 pts Very Poor | No initiative or interest in acquiring new knowledge	6 pts
SO 7 PI 2 **Student Outcome 7.2** Learn independently threshold: 4.8 pts	6 pts Excellent | Completes an assigned task independently and practices continuous improvement	5 pts Good | Completes an assigned task without supervision or guidance	4 pts Satisfactory | Requires minimal guidance to complete an assigned task	3 pts Unsatisfactory | Requires detailed or step-by-step instructions to complete a task	2 pts Poor | Shows little interest to complete a task independently	1 pts Very Poor | No interest to complete a task independently	6 pts
SO 7 PI 3 **Student Outcome 7.3** Critical thinking in the broadest context of technological change threshold: 4.8 pts	6 pts Excellent | Synthesizes and integrates information from a variety of sources; formulates a clear and precise perspective; draws appropriate conclusions	5 pts Good | Evaluate information from a variety of sources; formulates a clear and precise perspective.	4 pts Satisfactory | Analyze information from a variety of sources; formulates a clear and precise perspective.	3 pts Unsatisfactory | Apply the gathered information to formulate the problem	2 pts Poor | Gather and summarized the information from a variety of sources but failed to formulate the problem	1 pts Very Poor | Gather information from a variety of sources	6 pts
SO 7 PI 4 **Student Outcome 7.4** Creativity and adaptability to new and emerging technologies threshold: 4.8 pts	6 pts Excellent | Ideas are combined in original and creative ways in line with the new and emerging technology trends to solve a problem or address an issue.	5 pts Good | Ideas are creative and adapt the new knowledge to solve a problem or address an issue	4 pts Satisfactory | Ideas are creative in solving a problem, or address an issue	3 pts Unsatisfactory | Shows some creative ways to solve the problem	2 pts Poor | Shows initiative and attempt to develop creative ideas to solve the problem	1 pts Very Poor | Ideas are copied or restated from the sources consulted	6 pts
							Total Points: 24