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ROLL NO :-180103036 (CSE)

Q1.State the differences between object oriented programming and procedure oriented programming ?

| Basis for comparison | POP | OOP |
|-----------------------------|---|--|
| Basic | Procedure/Structure oriented . | Object oriented. |
| Basis | Main focus is on "how to get the task done" i.e. on the procedure or structure of a program . | Main focus is on 'data security'. Hence, only objects are permitted to access the entities of a class. |
| Division | Large program is divided into units called functions. | Entire program is divided into objects. |
| Entity accessing mode | No access specifier observed. | Access specifiers are "public", "private", "protected". |
| Overloading or Polymorphism | Neither it overload functions nor operators. | It overloads functions, constructors, and operators. |
| Inheritance | There is no provision of inheritance. | Inheritance achieved in three modes public, private and protected. |
| Data hiding & security | There is no proper way of hiding the data, so data is insecure | Data is hidden in three modes: public, private, and protected. hence data security increases. |
| Data sharing | Global data is shared among the functions in the program. | Data is shared among the objects through the member functions. |

Q2. Difference between Calloc function and new operator ?

| Calloc() | New operator |
|---|---|
| 1. calloc() are library functions that allocate memory dynamically. It means that memory is allocated during | The new operator is an operator which denotes a request for memory allocation on the Heap. If sufficient |

runtime(execution of the program) from the heap segment.

2.calloc() allocates the memory and also initializes the allocated memory block to zero. If we try to access the content of these blocks then we'll get 0.

Example program---

```
#include <stdio.h>
#include <stdlib.h>
int main()
{
    int* arr;
    arr = (int*)malloc(5 *
sizeof(int));
    free(arr);
    arr = (int*)calloc(5,
sizeof(int));
    free(arr);

    return (0);
}
```

memory is available, new operator initializes the memory and returns the address of the newly allocated and initialized memory to the pointer variable. When you create an object of class using new keyword(normal new).

1.The memory for the object is allocated using **operator new** from heap.

2.The constructor of the class is invoked to properly initialize this memory

Example program for New operator.

```
#include<iostream>
using namespace std;
class car
{
    string name;
    int num;

    public:
        car(string a, int n)
        {
            cout << "Constructor called" << endl;
            this ->name = a;
            this ->num = n;
        }

        void enter()
        {
```

```

        cin>>name;
        cin>>num;
    }

    void display()
    {
        cout << "Name: " << name << endl;
        cout << "Num: " << num << endl;
    }
};

int main()
{
    car *p = new car("Honda", 2017);
    p->display();
}

```

Q3. Write c++ program to evaluate the variance , standard deviation and mean of N numbers .(Select the values ,function etc .according to your convenience ,also take snapshot of the output and submit)

Soln:-

```

#include<iostream>
#include<math.h>
using namespace std;
int main()
{
    int n,arr[n],ch,i,sum=0;
    float mean = 0.0,variance=0.0,stdeviation=0.0;
    cout<<"how many number you want to calculate ?\n";
    cin>>n;
    for(i=0;i<n;i++)
    {
        cout<<"enter the no "<<i+1<<endl;
        cin>>arr[i];
    }

    for(i=0;i<n;i++)
    {
        sum +=arr[i];
    }
    mean = sum/n;
}

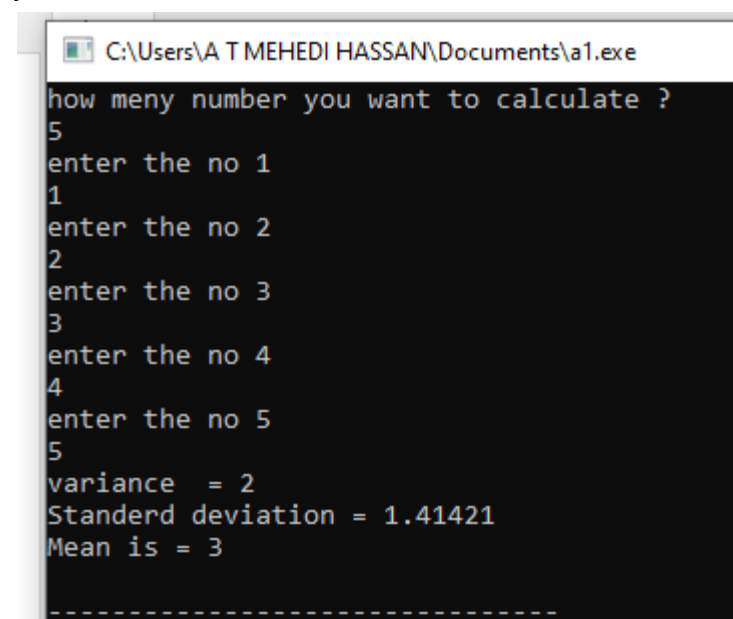
```

```

        for(i=0;i<n;i++)
        {
            variance += pow(arr[i] - mean,2);
        }
        variance = variance/n;
        cout<<"variance = "<<variance<<endl;
        stdeviation = sqrt(variance);
        cout<<"Standerd deviation = "<<stdeviation<<endl;
        cout<<"Mean is = "<<mean<<endl;

return 0;
}

```



```

C:\Users\A T MEHEDI HASSAN\Documents\al.exe
how meny number you want to calculate ?
5
enter the no 1
1
enter the no 2
2
enter the no 3
3
enter the no 4
4
enter the no 5
5
variance = 2
Standerd deviation = 1.41421
Mean is = 3
-----

```