Programming Afsoomaali
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Variable

Waa maxay variable?

Diyaar! Waxa aad go'aansatay in aad GURI dhisato. Haye. Haddaba waa saxe halkeed wax ka bilaabaysaa ? Waa maxay talaabada u horraysa eed qaadaysaa?

Aga! Oo waxani ma su'aal baa, loolz. Waa simple waxa aad u tagaysaa qof guriga aad dhisan rabto kuu QORSHEEYA.

Haye waad u tagtay wuuna kuu qorsheeyey, plankii oo WARQAD ku xardhanna waa ku siiyey. Su'aashu se waxa ay tahay QORSHIHII(plan) ma seexan kartaa? Waa su'aal ciyaal!

Jawaabtu waa maya. Si aad u seexato waxa aad u baahantay DHISME. QORSHIHII laguu sameeyey ayaad ku binaysay dhisme. Haddaba qorshuhu waxa uu haa virsual halka Dhismuhu yahay Phisical waad i fahantay baan filayaa. Wax ba ha i fahmin, loolz.

Waadigan gurigii dhisay , cidi kuma jirto waa madan yahay yacnihii waa NULL. haddii aan cidi ku jirinna dee faa'iido ma leh.

Markaa waa in guriga la dego si loo manaafacsado yacnihii qiimo (VALUE) loo yeelo.

QORSHE + DHIME = DAD (la dagan yahay)

TYPE + NAME = VALUE;

Haddaba haddii aad maqasho VARIABLE marka programmingka la joogo , type waxa ay ka dhigtay QORSHE , name waxa uu ka dhigan yahay DHISME , halka VALUE uu ka dhigan yahay DADkii guriga daganaa. It's as simple as that.

Sidaa awgeed ayaa waxa la dhahaa Typeku waa blueprint oo waa virtual; xasuusnow QORSHUHU waa blueprint. Halka uu dhismuhu yahay dheegga(copy) qorshaha , Value guna yahay guriga dadka/alaabta ku jirta.

Waydiintu waxa weeyi Guri bilaa qorshe ah ma la dhisi karaa? Waa maya. Haddaba Variable bilaa Type ahina ma jiri karo. Halka guri qorshe lagu dhisay uun laga degi karo ayuun baa Variable type loo sameeyeyna Value la ga siin karaa.

Tusaale ahaan sidan :

Qorshe Dhisme = dad; // sax

int i = 100; // valid

Xasuuanow:

Qorshe = dad; // qalad.

Dhisme = dad; // qalad.

int = 100; // invalid.

i = 100; // invalid.

Student = new Student(); //invalid.

Waxa aynu ka hadlaynaa waa VARIABLE. Variable waa eray ka yimi vary oo ah doorsoome. Sabab! Marka aynu leenahay GURI , guri muxu noqon karaa Guri Yar, Mid wayn, fooq , guri soomaali sidaa darteed GURI waa doorsoome si yaabo kala duwan loo dhisi karo.

Si tan la mid ah ayaynu 'i' siin karnaa 100 200, 10 tan oo noqonaysa in qiimaheedii isbadbadalay oo ah VARIABLE.

Haddaba 'qorshe', 'int' iyo 'Student' waa blueprint waa QORSHEYAASHII sidaas darteen toos looma isticmaali karo , kaliya waa in DHEEG(instance/copy) laga sameeyo waa sababta OBJECT(physical =guri) loogu bixiyey ee loo yidhi : OBJECT is an instance of a class. Dabcan QORSHE , INT IYO STUDENT waa classes(virtual = qorshe).

How loop works in programming?

Inta aynaan sida loop(qool) u shaqeeyo isla eegin, aan isla garanno waa maxay loop?

Loop waa xidhmo code ah oo muddo cayiman soo noqnoqota. Tusaale in aan taxno [0-9] markiiba hal tiro waxa ay odhan karnaa loop(qool) kani waxa uu soo noq noqday 10 jeer.

Haddii aan u nimaadno sida uu u shaqeeyo . Loop ku waxa uu ka kooban yahay :

1. Starter(initial)

2. Condition

3. Increment

Starter: waa halka wareegga/loop laga bilaabayo. Waxa loo yaqaan "initial value".

Condition: Waa shardiga lagu xidhayo si loo xaqiijiyo in ay natiijadu saxtahay iyo in kale. Shuruuddani haddii ay been noqoto loopku waa in uu joogsadaa.

Increment: Waa halka wareegga laga kordhinayo si loogu gudbo tirada ama step ka xiga. Haddii aan increment/kordhin lagu samayn waxa dhacaysa in loop ku noqdo mid aan dhammaad la hayn oo loo yaqaan "infinite loop" .

FG: "Ka taxadir in loop ku noqdo mid aan dhammaad la hayn waayo waxa uu keenaa stack overflow".

Loops waxa loo qaybiyaa marka prog lang la joogo:

1. While/ do ..while loop

2. For loop.

U jeeddo ahaan waa isku mid se shaqo ahaan way kala gaddisan yihiin. Mar kale ayaynu is barbar dhigi doonaaye.

Waxase aad maskaxda ku haysaa, "do..while loop ugu yaraan hal marka ayay shaqada qabataa iyada oon shuruudda hubin. Luuqadaha qaarna ma leh ".

Tusaale:

```
// Program waxa uu taxayaa 0-9. while loop ayaynu adeegsan.

int i = 0; // starter (initial value)

while( i <= 9){ // condition

System.out.print(i + " ");

i += 1; // increment

}
```

```
// Program waxa uu taxayaa 0-9. for loop ayaynu adeegsan

for( int i = 0; i <= 9; i ++){ // initial condition increment

System.out.print(i + " ");

}
```

Waan ogahay oo la ima fahmin, loolz.

Halkan ayaan idin kula wadaagi sharraxaad kooban se intan ku sii sug ha loo qaato; akhyaartana la sii wadaaga.

Class

Marka programmingka la joogo class waa xero. Xero waa xayn daab kooban oo xoolaha lagu hooyo/xareeyo habeenkii si dhurwaaga iyo baylahda looga jiro. Si tan la mid ah ayaa proramka lagu xareeyaa class kaas oo ka ilaaliya tuugada iyo fadhatada(security).

Xeradu waa wareeg xidhiidhsan oo ay ku dhex jiraan xeryo yar yar sida xerada nirgaha iyo baraarka; kuwan ayaana sii kordhiyana ilaalinta iyo kala sooca xoolaha. Xerada waxa ku jira agab badan sida seetada, usha iyo qoolka baraarka.

Si tan la mida ah class ku waxa uu yeelan karaa class hoosaadyo(inner classes) kuwan oo ku dara adkayn iyo kala sooc. Classku waxa uu leeyahay xubno ay ka mid yihiin methods iyo properties ku.

Xerada u jeedkeedu waa in la gu ka la sooco xoolaha sida xerada Geela, Lo'da, Adhiga si tan la mid ah ayuu class yahay erayga 'classification' oo ah kala sooce. Haddaba class waxa lagu kala soocaa programka sida Student, Employee, Main oo dhammaantood classes ah.

Guntii class waa xero wada-jirka(Encapsulation) iyo Amniga(Security) programka lagu sugo.

Method

Waa maxay Method?

Su'aashan waxa in badan i soo waydiisa dhalinta si gaara kuwa daneeya #programmingka. Waayahay!

Haddaba i soo raac. Waxa aad furatay Bank Account si aad hawlaha maalin la ah ugu isticmaasho.

Marka aad Bankiga furanayso waxa la gu waydiiyaa caddaymo sida ID,SHAHAADO ama LIISAN kuwan oo lagu kaydiyo Banka si mustaqbalka hawlaha adiga ku khuseeya loogu adeegsado.

Marka Account ka laguu fasaxo, waxa aad samaysaa hawlo badan sida DHIGASHADA lacagta, LABIXIDA lacagta

iyo DIRIDA lacagta aad saaxiibaddaa u xawisho.

Haddaba BankAccount marka programmingka la joogo waa #Class. ID ga, SHAHAADADA iyo LIISAN kuna waa #Variables kuwan oo xogta lagu kaydiyo halka hawl qabadka DHIGASHADA, LABIXIDDA iyo DIRIDU yihiin #Methods.

Waxa aynu halkan ka garan karnaa hawl qabadka/shaqada ayaa waxa loo yaqaanaa Method. Tan oo ka dhigan

shaqo kastaa waxa ay leedahay hawl gaara tusaale ahaan DHIGASHADA iyo DIRIDU waa laba hawlood oo aad u kala durugsan. Sidaa darteen ayaa waxa la yidhaa "Methods are used to perform certain/specific actions".

Dhanka kale haddii aynu ka eegno QOF ku waxa uu sameeyaa afcaal badan sida CUNIDA, SOCOSHADA, HADLIDA; haddaba ficiladan marka programmingka la joogo waxa loo yaqaan METHODS.

```
public class BankAccount {

private Long acc;

private String type;

public void deposit(double amount){

}

public double withdraw(double amount){
}
```

Waxa xiiso leh in marka aad lacag BANk DHIGANAYSO aanad wax ba kala so noqonin; waayo lacagtii aad sidatay waad dhigatay sidaa darteed adiga oo faro madhan ayaad ka soo laabanaysaa. Haddaba markan MEHTOD/action waxa loo yaqaan "non-value return type".

Halka marka aad lacag la soo BAXAYSO aad adiga oo jeebku kuu buuxo ka soo laabato BANKA ,loolz. Tan ayaa ka dhigan in "Method/action ku soo celinayo qiime", waxaana loogu yeedhaa "value return type".

Tusaaleha xagga sare ku qoran "deposit()" waa "non-value return type" sidaa awgeed waxa lagu calaamadiyay "void/madhan" , halka "withdraw()" ka tahay "value return type", laguna asteeyey " double/lacag".

Waan ogsoonahay in aanad wax badan iga fahmin se waxa aan rajaynayaa in wuxuun kaaga soo duxeen.

Waa maxay Farqiga u dhexeeya Overloading iyo Overriding?

Overloading iyo Overriding maxa farqi u dhaxeeya?

Horta su'aashani waa kuwa ugu badan ee ayna programmersku fahmin ama ku shawakhaan!

Qofka raba in uu si fiican u kala barto waa in uu OOPS concepts wax badan ka og yahay , innaku u gali maynee!

Si aan si sahlan ugu fahanno inaka oon sii dhexgalin aan dulxaadin ku sameeyo farqiga u dhaxeeya!

Horta waa mare labaduba waxa kaliya ee ay khuseeyaan waa Methods. Waxase muhiima in aan Method isla garanno marka hore.

Method : " Waa xidhmo koodh ah oo shaqo gaar ah kuu qabanaysa". Waa run oo tani qeexidda aad u taqaaniin Function; ha waa sax.

Method iyo Function waa isku mid kaliya marka functionku ka tirsan yahay Object /class ayaa la yidhaa METHOD. War dhammaaday dhe! [Method horaan uga hadlaye halkan ka baadh].

Haddaba haddii ay labaduba method uun khuseeyaan maxaa farqi u dhaxeeya!

Overloading: Wa la yidhaa marka laba method iyo wixii ka badan oo isku magac ah ay haddana kala saxeexyiihin(diff signature).

Aan tusaale ku binayno qeexiddeenan:

```
package com.riigsoft;

public class Math {

public void abs(int i){
```

```
// Absolute value for whole numbers.
}
public void abs(float f){
// Absolute value for float numbers.
}
public void abs(long l){
// Absolute value for decimal numbers.
}
}
```

Methodka abs(--) ee ka tirsan classka "Math" waxa uu leeyahay 3 method oo isku magac ah (abs) se ka la parameter ah oo kale ah int, float, long.

Tan aayaa loo qayaan method Overloading ee meel ku qoro.

Waa maxay method signature? Luuqaduhu waa ku kale gaddisan yihiin tan se marka Java-da la joogo method signature waxa la yidhaa intan:

Method name + parameter type/number

Mesalan:

abs(int i) way ka signature duwantahay abs(long l); waayo parameter type ayay ku kala duwan yihiin oo ah 'int' iyo 'long', lkn haddii ay noqoto abs(int i) iyo abs(int i) waa Khalad.

Waxa kale oo ay noqon karaan sidan:

abs(int i) iyo abs(int i, int j) , halkan parameter type waa isku mid(int) lkn waxa ay ku kala duwan yihiin number of parameters oo ah 1 iyo 2. La I fahan.

Method Overloading waxa ay sahashaa in code clean and clear ah la qoro tan oo isticmaalaha u fududaynaysa in uu si sahlan u adeegsado. Tusaale ahaan u ma baahna in uu methods kala duwan u yeedho ee kaliya abs(--) ayuun buu markasta isticmaalayaa sida:

abs(10) , abs(10.5) waana u jeedka method Overloadingka.

Markale ayaan sharixiye method Overloading waxa loo qayaan "Complite time polymorphism", "static polymorphism" ama "Early binding".

Aan halkaa laga hadnee method overriding u soo noqo.

Overriding: "Waa dib u hirgalinta shaqo hore loo qabtay". Tani waxa kaliya ee ay ku shaqaysaa nidaamka dhaxalka (dhaxalka hore ayaan uga hadlay ee halkan ka raadi).

Waxa Method overriding samayn kara oo kaliya laba class/interface oo is dhaxlay.

Aan tusaale ku habsiinno:

```
package com.riigsoft;
public class Animal {
public void sound(){
//Any sound
}
}
public class Cat extends Animal {
public void sound(){
// Maw maw ....
}
}
```

Tan ayaa noqonaysa in aan methodka sound() ee ka tirsan classka "Animal" aynu dib u hirgalinay(re-implementation) marka uu ka tirsan yahay classka "Cat" ee dhaxlay(extends) classka "Animal".

Method overriding waxa ay leedahay shuruudo badan iyo meelo badan oo u baahan in si qoto dheer loo muquurto markaa hadda sidaa guud baan ku dhaafi. Markale ayaynu dhex muquurane tanna waxa loogu yeedhaa " Runtime polymorphism", "Dynamic polymorphism" ama "Late binding" .

Waan ogahay oo wax badan la igama fahmin, waana gaabin dhankayga ee ha loo dulqaato; hana la sii baadho oo yaan intan la isku halayn.

Abstraction

Soo qaad rimuutka Tv-ga. Haa rimuutka soo qabo deedna eeg badhanka (v+) ama (v-). Maxay yihiin? Su'aal carruurta innaga dhaaf , loolz. Tani waa sababta aan xogta ku duuggan (v+) ama (v-) kaaga qariyey ee kaliya kuugu soo koobay in codka lagu kordhiyo ama la gu yareeyo bes.

Waxa se og tahay in ayna v iyo + la isku daray cod dheeri samayn karin ee ay jirto program ama hawl qabad ku soo jira v+ oo adiga kaa qarsoon se shaqeeya marka aad taabato v+. Haddaba xogtan kaa qorsoon baa loo yaqaan ABSTRACTION.

Abstraction: Waa in xogta aanad u baahnayn lagaa qariyo oo kaliya lagu siiyo inta aad adeegsigeeda u baahan tahay bes.

Adi waxa aad u baaahan tahay badhan aad qabato si uu codku u kordho ama u yaraado se uma baahnid in aad barato sida uu u kordho ama u naaqusmo iyo talaabooyinka la maro si tan loo sameeyo. Adiga kuwaa maxaa kaa galay kaliya 'naaqus' ama 'dalac' oo Tv iska daawo.

Tan ayaan marka Computer Science la joogo loo yaqaan "abstraction".

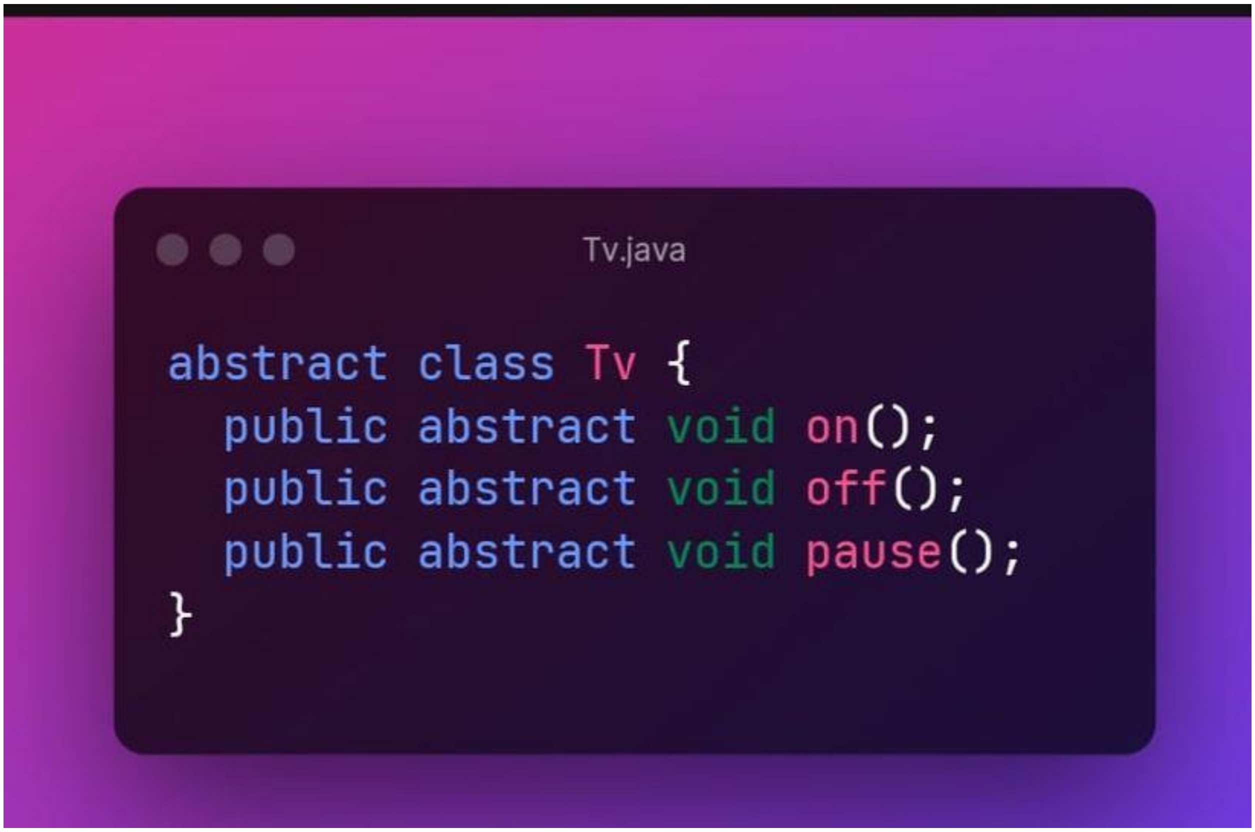
Abstraction: hiding details of instance.

Abstraction waa sarbeeb sida aan u naqaanno soomaaliga oo ah hadal aan laguu saafin ee la guu sarbeebay. Tan oo ah in macluumaad badan oo hadalka ama weedha ku gadaaman lagaa qariyey loona daayey maskaxdaadu in ay ku biirsato.

U jeeddo tan la samin ayaa programmingkana abstraction loo adeegsadaa. Waxa ay tahayna in la gaa qariyey faahfaahin badan kaliyana lagu siiyey doorashooyin koob kooban.

Tusaale: code snippet hoose eeg. Halkan kaliya waxa aan u jeednaa methods kuwaas oon la hayn wax qeexida. Kaliya waxa la ina siiyey sumadoodii. Tan yaana loo yaqaan "abstraction". "Abstraction la ga ma dheegi karo objects waayo ma lahan wax qeexida".

Note: Si aad u qeexdo waxa aad u baahan tahay "class" kale oo kuu sameeya taas.



```
abstract class Tv {
  public abstract void on();
  public abstract void off();
  public abstract void pause();
}
```

Programmingka iyo Dhaxalka?

Sida magaca iyo lacagta looga dhaxlo waalidka ayaa programmingkana laba class/interface isu dhaxlaan.

Dhaxalkan aadahana oo ku dhisan Waalid iyo Carruur ayuun baa programmingkana lagu askumay.

Haddaba waxyaabaha la kala dhaxlo waxa laga dhigaa public si ay ugu gudbaan carruurta. Halka waxyaabaha qaar ayna suuro gal ahayn in la kala dhaxlo sida Xirfadda .

Aan tusaale ku binayno:

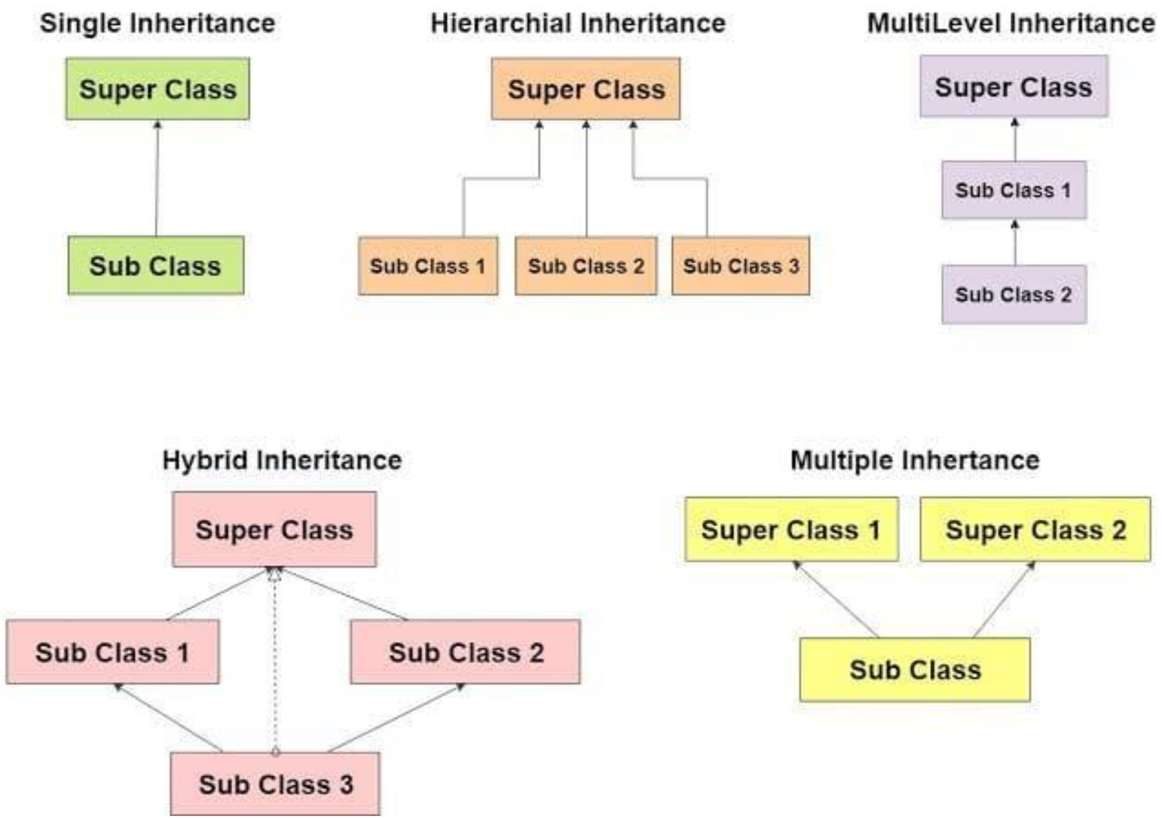
```
package com.riigsoft;
// Parent class
public class Parent {
public String name; //waa la dhaxli kara.
private String professional; // lama dhaxli karo.
public String getProfessional(){
return professional;
}
public void setProfessional(String professional){
this.professional = professional;
}
}
// Child class
public Child extends Parent{
public int age ;
//name : oo ah kii Parent class laga dhaxlay.
}
public class Main{
public static void main(String[] args){
//Create Parent class object
Parent parent = new Parent();
//set name and professional value
parent.name = "Riig";
parent.setProfessional("Software Eng");
parent.age = 65 ; // error wayo dhaxal kama dhaxeeyo(*)
System.out.println(parent.name); System.out.println(parent.getProfessional());
// Create Child class object.
Child child = new Child();
// set name and age value.
child.name = " Abdallah"; // from Parent class (dhaxal).
child.age = 27;
System.out.println(child.name);
System.out.println(child.age);
}
}
```

* Tani waxa ay muujinaysaa in carruurtu waalidka dhaxli karto se waalidku carruurta aanu dhaxli karin.

Haddaba fikradda nooca oo looga faa'idaystay nolosha aadanaha iyo wax soosaarka programming waxa loo yaqaan Inheritance feature. Keyword ka "extends" ayaana ah kan muujinaya dhaxaltooyadsa ka dhaxaysa laba class ama laba interface.

Inheritance waxa ay leedahay qaybo badan ase markale ayaynu eegi doonnaa.

Programka xagga sare ku qoran haddii aad execute garayso waxa aan rajaynayaa in uu kuu shaqayn doono.

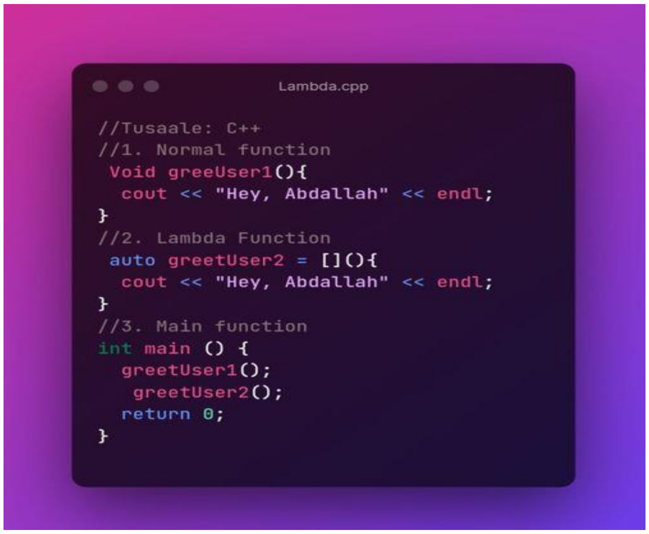


Lambda

Waa xidhmo koodh ah oo "bilaa magac ah". Haa bilaa magac ah. Horta marka hore magac bixinta u jeedkeedu waa maxay ? Waa in marar badan shayga loogu yeedho ama lagu aqoonsado.

Haddaba lambda function waxa la adeesadaa marka shayga aan marar badan loo baahnayn.

Lambda wax kasta waxa ay ka la siman tahay functionka caadiga ah marka laga reebo magaca. Haa magaca bes!!!.



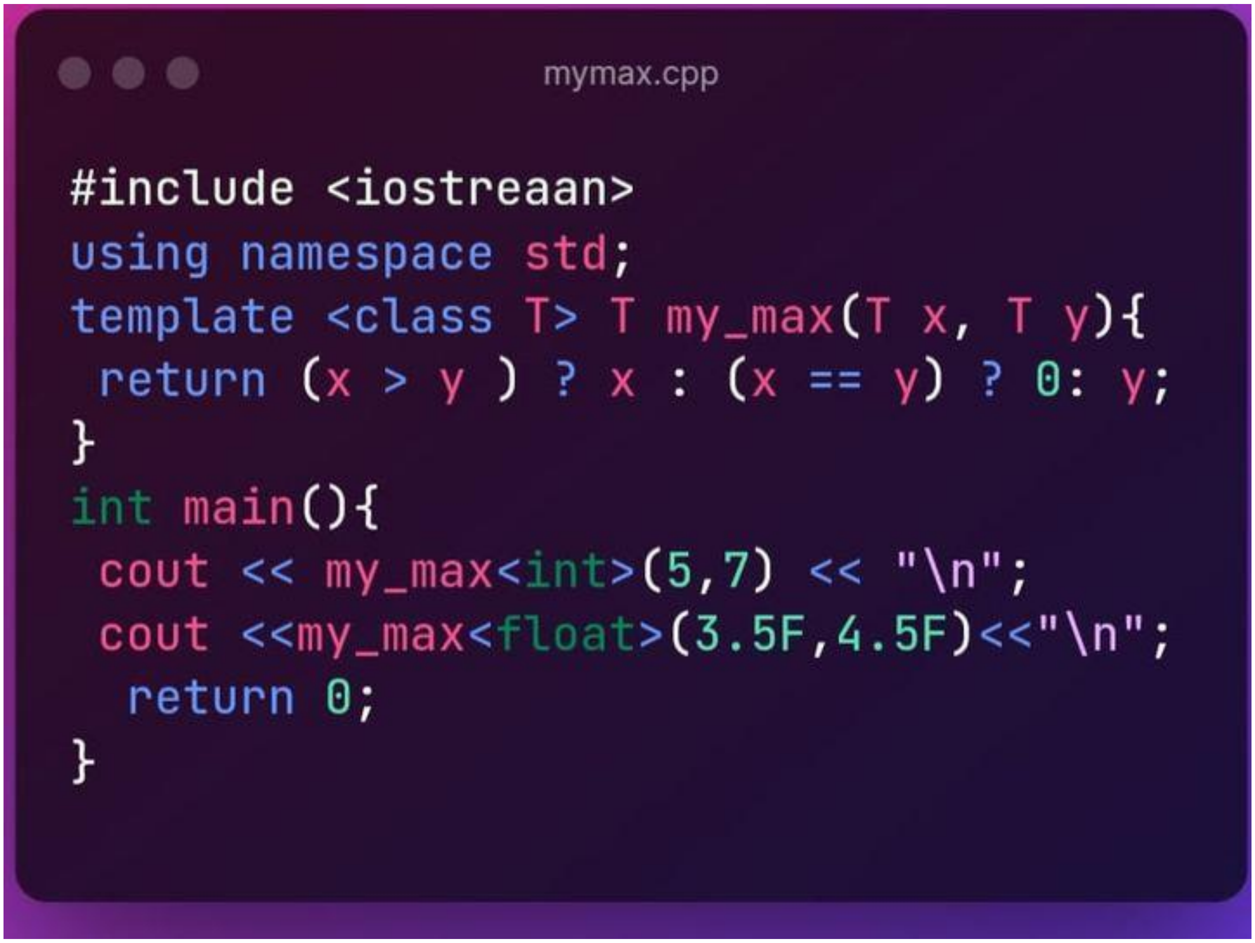
```
//Tusaale: C++
//1. Normal function
 Void greeUser1(){
  cout << "Hey, Abdallah" << endl;
}
//2. Lambda Function
 auto greetUser2 = [](){
  cout << "Hey, Abdallah" << endl;
}
//3. Main function
int main () {
  greetUser1();
   greetUser2();
  return 0;
}
```

Template in C++

Waa classka ama function oo laga dhigo mid deeqsiya oo nooc kasta oo xog ah aqbala.
Tusaale, haddii aan haysano function kaas oo is barbardhigaya laba tiro x iyo y soona celina ka wayn kaddii kalena 0; dheh ba my_max(int x, int y). Lnk dhibku waxa uu yahay in aynu is barbardhigi karno oo kaliya laba tiro oo idil dhe 3 iyo 5 sababta oo ah functionkeennu waxa uu aqbali karaa oo kaliya nooc 'int' yacnihii idil.
Haddaba ka waran haddii aan isbarbar dhigi rabno tiro jabjab leh sida 3.5 iyo 4.5 maxaa xal ah ? Waa in aan samayno function kale oo aqbalaya sida my_max(float x, float y). Ok. Kan waxa loo yaqaan function "overloading".
Haddaba bal ka waran haddii aan rabto mid kale oo aqbalaya character dhe 'a' iyo 'b'? Sow ma ahan in aan samayno function kale sida my_max(char x, char y) tan oo ka dhigaya Code-keenna mid badan oon nadiif ahayn. Haddaba halkan waxa xal u ah "template" oo inaga kaafinaysa; inaka oo samaynayna "hal function" oo kaliya kaas oo aqbali kara nooc kasta oo xog ah, sidaas darteed ayaa loo yaqaan "Generic function or class" ama function ama class ka deeqsiga ah.

```
template <class T > T my_max(T x, T y){
return (x > y) ? x : (x == y) ? 0 : y;
}
```

T: waxa ay u taagan tahay xog kasta (any type).
Code snippet sawirka ka muuqda ayaad ka arki kartaa.



```
#include <iostreaan>
using namespace std;
template <class T> T my_max(T x, T y){
 return (x > y ) ? x : (x == y) ? 0: y;
}
int main(){
 cout << my_max<int>(5,7) << "\n";
 cout <<my_max<float>(3.5F,4.5F)<<"\n";
  return 0;
}
```

Waa maxay Pointer ?

Inta aynaan isla eegin pointer waxa habboon in aad wax ka ogaanno #variable.

Variable waa kaydiye la gu kaydiyo qiime ama alaab, sida bakhaar lagu kaydinayo raashin amaba guri la daggan yahay.

Haddaba guriga waxa loo yaqaan variable halka dadka daggani yihiin qiimihii ama wixii lagu kaydinayay. Variable ama doorsoome kastaana waxa uu leeyahay nooc. Tusaale ahaan guriga waxa uu noqon karaa noocyo badan sida fooq, filo ama aqal soomaali. Haddii aad rabto in aad wax badan ka sii ogaato akhri [https://bit.ly/3QosRMx].

```
type vairableName = value;
fooq riigHouse = riigFamily;
```

Haddii aan intaa isla garanay , pointer waa addresska guriga aan dagganahay. Haddii gurigu yahay variable, dadku yihiin qiimihii, addresska guriguna waa pointer.

Pointer waxa uu kaydiyaa addresska variable/guriga taas oo ah meesha ama locationka u dagganyahay.

Gurigu haddii uu dhulka daggan yahay variable waxa uu daggayahay 'Memory' computerka.

Addresska haddii lagu muujiyo ↗pointers waxa lagu muujiyaa &.

```
pointer = &variableName;
```

Xagga qeexidda waxa lagu qeexaa * oo ah calaamadda loo adeegsado isku dhufashada.

```
int *point = NULL ;
```

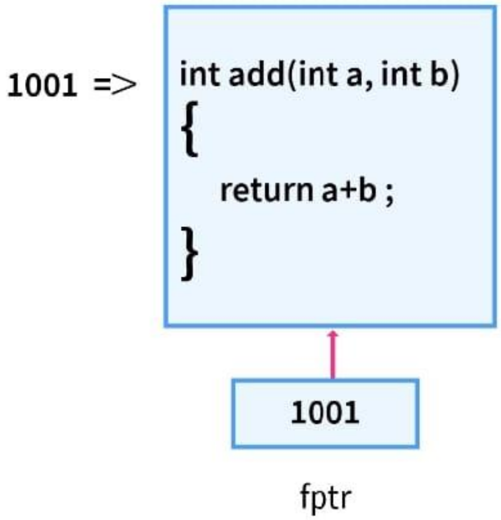
Sida address guryuhu u kala duwan yihiin ayaa address ka variables kuna u kala duwan yihiin. Waliba waxa ay si kaara ugu sii xiran yihiin Computer iyo nooca OS kiisa.

Tusaale kooban: C program.

```
#include <studio.h>
int main ()
{
int number = 9;
int *pointer = &number;
printf("Address using & = %x\n", &number); // 60ffp8
printf("Address using pointer = %x\n", pointer); // 60ff08
printf(" Value using variable = %d\n", number); // 9
// Qiimaha pointer waxa lagu helaa *.
printf(" Value using pointer = %d\n", *pointer); // 9
// Inaka oo adeegsanayna pointer ayaa waxa aan baddali karnaa qiimaha variable ka.
*pointer = 99;
// Qiimaha number waa is badalay oo waxa uu noqday 99 sababtuna waa in *pointer iyo number isku address dagganyihiin.
printf(" Value using variable = %d\n", number); // 99
printf(" Value using pointer = %d\n", *pointer); // 99
return (0);
}
```

FG: Address number waa tiro aan sugnayn oo waxa dhici karta laba jeer oo isku xigta oon programma kicinno in ay kala duwanaato. Pointers waxa aad u adeegsada luuqadda C/C++. Mararka qaar pointer waxa loogu yeedhaa reference sida luuqadda Java, C# . Lkn xasuusnow reference iyo pointer waa kala duwan yihiin.

U jeeddada ugu wayn ee pointer waa in uu kordhiyo kab isticmaalka memoryga (memory management).

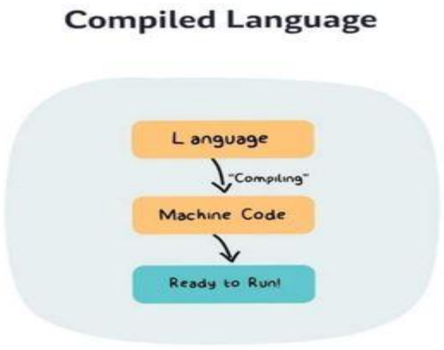


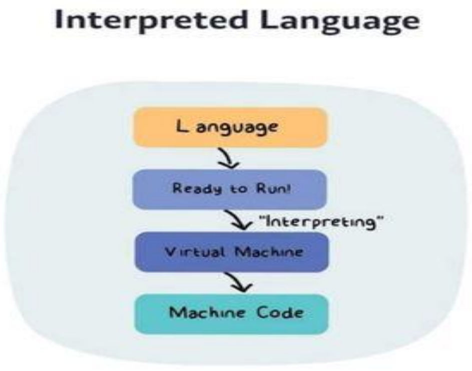
```
int add(int a, int b)
{
    return a+b ;
}
```

Waa maxay farqiga u dhelaxeeya Compiler iyo Interpreter?

Horta maalin wanaagsan! Su'aalaha laba shay baan ka faa'idaa:
1. In aan baadhid tago oon wax soo akhriyo, iyo
2. In aan isku dayo in aan qoraal wax ku gudbin karo.
U soo noqo u jeedka. Inta aynaan isla eegin farqiga u dhaxeeya labadan , aan marka hore qeexno Compiler/Interpreter waxa uu yahay.
Compiler/Interpreter waa: " Software kaas oo dhallan-gadiya macluumaadka la akhrin karo una gaddiya mid aan la akhrin karin". Marka aan akhriska ka hadlayno waxa aan u jeednaa akhriska aadanaha.
Luuqadaha programmingka ee casrigii waxa ay ku qoran yihiin luuqad la akhrin karo sida Somali, English ...
Haddaba Compiler/Interpreter waxa uu dhalan-gaddiyaa luuqadda la akhrin karo oo uu ka dhigaa mid aan la akhrin karin oo loo yaqaan "Machine Code". Machine Code waxa akhriya oo kaliya Computerka. Machine codeku waxa ay u qoran yihiin '0' iyo '1' sidaa darteed baa loo yidhaa Binary Codes oo ah labaalayaasha; waayo waxa ay ka koobanyihiin laba god.
Intaas haddii aan isla qaaddanay aan eegno farqiga u dhaxeeya Compiler iyo Interpreter . U jeed ahaan waa isku mid oo labadu ba waxa ay gaddiyaan qoraalka la akhrin karo kana dhigaan mid aan la akhrin karin, " Compiler/Interpreter converts readable language to unreadable format".
Lnk farqi wayn baa u dhexeeya, waana sida tan:
Compiler: Waxa uu hal/toos mar wada gaddiyaa dhammaan programka qoran una gaddiyaa Machine Code. Tan ayaa ka dhigan in haddii error ku jiro pragramka ayna marnaba suuro gal ahayn in uu kaco/run ama output soo saaro. Habkanna waxa uu maraa laba step:
1. Build : waa compile/dhalan-gadi.
2. Run : waa Execute oo ah in output la soo saaro.
Waxa kale ood maskaxda ku haysaa in haddii programka wax laga badalo loo baahan yahay in la sameeyo labada step ee sare ku xusan:
1. Rebuild : recompile

2. Run : Execute
Luuqadaha qaabkan u shaqeeya waxa loo yaqaan Compiled Languages waxaana ka mid ah: C, Java, C++...
Interpreter : Waxa uu layn bay layn u gaddiyaa programka qoran kana dhigaa Machine Code. Tan ayaana ah in uuna Interpreterku u baahnayn wax la yidhaa "Build". Hore ayuu ka soo saarayaa outputka isaga oon sugin dhallan-gadiska.
Haddiise error dhaco waxa khasaba in uu istaago programku kuna ekaado halka uu errorku ka dhacay.
Luuqadaha qaabkan ku shaqeeya waxa loo yaqaan Interpreted languages waxaana ka mid ah: Python, Javascript ...
Marka la eego dhanka surcada iyo degdegga compiler ayaa aad uga fiican interpreterka.
Compiler waa course dhan oo ay tahay in sidiisa loo barto se waxa aan kuu rajaynayaa in aad wax badan ka la dhex baxday.


Compiled Language


Interpreted Language

Tibaaxyo iyo Talooyin Kale

HTML, CSS ayaan dhigtaa ee C Language maxaan uga baahanahay? Waa su'aasha ugu badan ee i soo gaadha.
Haddaba si aynu uga warcelino marka hore waa in aynu isla garanayaan waa maxay HTML, CSS?
Waxa aad haysataa Warqad iyo Qalin. Warqaddii ayaad qalinkii laydi[rectangle] ku sawirtay adiga oo QALINKA ku calaamadinaya(marking). Haddaba ma logic baa in wax la calaamadiyaa ,runtii waa MAYA.

Haddaba HTML waxa la yidhaahdaa waa "Luuqadda sumadda qoraalka" [HyperText Markup Language]. Hadda kow dhe !
Laydigii(rectangle) ayaad nashqadaysay oo qurxisay oo midabo kala gaddisan ku xaradhay ood subbar ka dhigtay. Haddaba qurxintani ma LOGIC baa waa MAYA.
Haddaba CSS waa luuqadda qurxinta qoraalka[Cascade Style Sheet].
Si aan kuu fahansiiyo in C language u baahantahay waxa la gu yidhi waxa aan u baahanay Xisaabiye(Calculator) isku gaynaya laba tiro . Isu gaynta laba tiro ma ahan sumadayn(HTML) mana aha qurxin(CSS) ee waa processing(dhalan rogid) tan oo noqonaysa LOGIC.
Sidaa darteed waxa aad u baahantahay Logic language oo C ka mid tahay!
Xasuusnow marka aan ku celcelinayo C LANG ha la barto macnaheedu ma ahan iyada LA'AANTEED programming lama baran karo, waa BARAN kartaa se waxa hubaala in aad dhib badan ka mudan doonto waliba haddii aanad hore ugu shaqayn.
"Alif kaa xumaadaa Albaqruu ku dhibaa", C LANG ood ka boodaa gadaal bay kaa dhibi doontaa. So firts is first.

Si aan u xisaabino 3 + 2 , 3 * 2 iyo 3 ÷ 2 imisa Kalkuleetar baa u baahannahay? Mooji!
Qof kasta oo inaga mid ihi waxa uu ogtahay in hal Kalkuleetar ku filan yahay. Se wali ma is waydiisay say ku dhacday? Waxa ay ku dhacday wax loo yaqaan polymorphism oo ah in hal shay qaato qaabab kala duwan oo ku xidhan kolba waxa loo diro.
Hadda 3 + 2 = 5 oo Kalkuleetarku marka uu arko "calaamadda" aan isticmaalay in ay tahay '+' waxa uu inoo fulinayaa isku dar. Halkan 3 * 2 = 6 oo Kalkuleetarku marka uu arko calaamadda '*' uu inoo fulinayo isku dhufasho. Inta kalena waa la mid.
Haddaba bal ka soo qaad haddii ayna fikraddani jiri la hayn. Imisa Kalkuleetar baa u baahan la hayn; laa cadad walaa xisaab, looolz.
Waxa kale oo ognahay '+' ama '*' in ayna wax ba tarayn ee logic-ga ku hoos jiraa yahay kan hawsha innoo qabanaya; adiga se kaa qarsoon oo loo yaqaan 'abstraction'.
Haddii shaqada +, * ... wax la gu daro oo function cusub lagu kordhiyo sida in la isku geeyo laba 'poin'.
A = Point(2, 3);
B = Point(4, 5);
Oo aan rabno in aan samayn karno:
C = A + B; yacnihii C = Point(6, 8);
Tan markii la rabo in programmingka lagu soo daro waxa la sameeyaa qayb ka mid ah polymorphism oo loo yaqaan "Operator Overloading" oo macnaheedu yahay in '+' ku darnay shaqo cusub oo ah in ay isu gayso laba point.
Overloading: Waa in hal method/function uu qabto shaqooyin kala duwan isaga oon magaciisa la badalin.

Function: xidhmo code ah oo leh sumad gaara una baahan in loo yeedho si ay hawl qabadkeeda u bilowdo.
Tusaale:
int factorial(){}
parameter: Goob loo diyaariyey in qiime la dhigo sida parking loo diyaarshay in Gaari la dhigo.
Tusaale:

```
// number: waa parameter.
int factorial( int number){}
```

Recursive Function: Waa function isagu isu yeedhaya; wuxuuna ka kooban yahay:

1. Base Case: Shuruudda ka bixidda celcelin yeedhitaanka.
2. Recursive Case: In uu isagu isu yeedho.

Tusaale:

```
int factorial (int number) {
// Bae condition
if (number == 0)
return (-1);
// Recursive case [ self call]
return factorial (number - 1 ) * number;
}
```

Argument: qiimaha dhabta ah ee parameter la siiyo. Yacni Gaariga laftiisa.

Tusaale:

```
int main (){
int number = 5;
int result = factorial (number); // argument.
printf("Result: %d\n"), result); // result: 120
return (0);
}
```

Waxa aan rajaynayaa in aad wax badan ka la baxday.

Programming: waa qabashada hawl go'an oo leh macluumaad habboon sida dhisidda, taxliilinta iyo saafidda macluumo shaqayn karta. Luuqadda lagu qorana waxa loo yaqaan programming language.

Framework: Waa program-yo diyaarsan oo kaliya u baahan in wax ka badbadal lagu sameeyo isla maarkaa u jeedkaaga lagu salaysto

API: Waa sida laba iyo wax ka badan oo program u wada xiriiraan yacnihii u wada sheekaystaan.

Qeexiddani ma ahan mid hal tabin ah ee waa mid fahan dhawayn ah.