

**GEBZE TECHNICAL UNIVERSITY
CSE414 DATABASES
TERM PROJECT
REPORT**

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Project

I am having calls from my relatives and friends. They are asking me to build a desktop computer that they can afford. Thanks to this course, I came up with creating a software for automating the computer building process. Of course, for desired price.

Users

Costumer: Able to view computer parts in database. Also, can build a computer with desired parameters.

Requirements

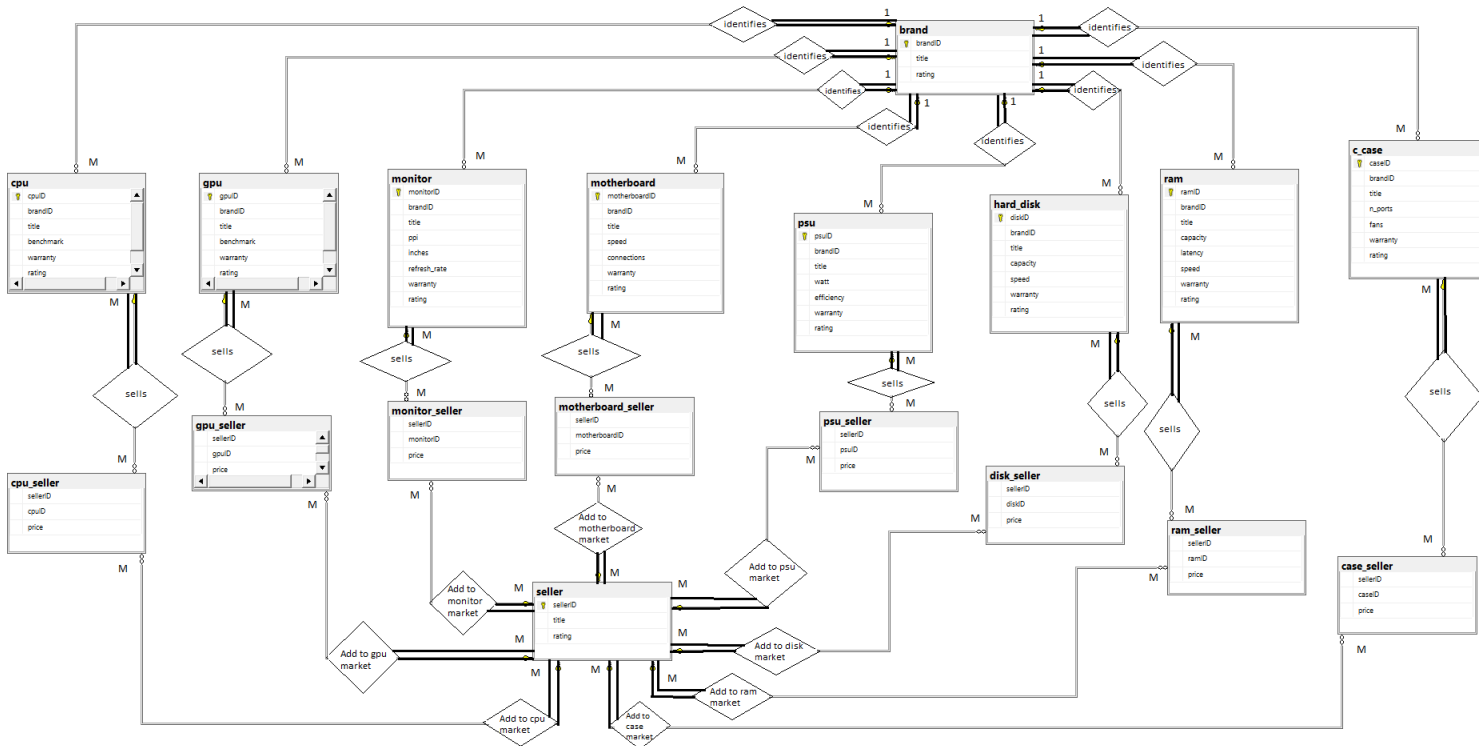
System requirements:

- Python, PyQt5 framework and QT Designer to build application.
- Microsoft SQL Server for database.

User requirements:

- Costumers should be able to build computer for desired parameters such as money, seller rating, brand rating, warranty.
- Costumers should be able to use software without logging in.
- Costumers should be able to view the all computer parts without building a computer.
- Costumers should be able to build a computer for gaming or working.
- Costumers should be able to build a computer by prioritizing performance or computer usage.

ER Diagram



Functional Dependencies

brand table

- brand_id --> title, rating

seller table

- seller_id --> title, rating

cpu_seller table

- sellerID, cpuID --> price

gpu_seller table

- sellerID, gpuID --> price

psu_seller table

- sellerID, psuID --> price

ram_seller table

- sellerID, ramID --> price

monitor_seller table

- sellerID, monitorID --> price

motherboard_seller table

- sellerID, motherboardID --> price

case_seller table

- sellerID, caseID --> price

disk_seller table

- sellerID, diskID --> price

cpu table

- cpuID --> brandID, title, benchmark, warranty, rating

gpu table

- gpuID --> brandID, title, benchmark, warranty, rating

psu table

- psuID --> brandID, title, watt, efficiency, warranty, rating

hard_disk table

- diskID --> brandID, title, capacity, speed, warranty, rating

motherboard table

- motherboardID --> brandID, title, speed, connections, warranty, rating

ram table

- ramID --> brandID, title, capacity, latency, speed, warranty, rating

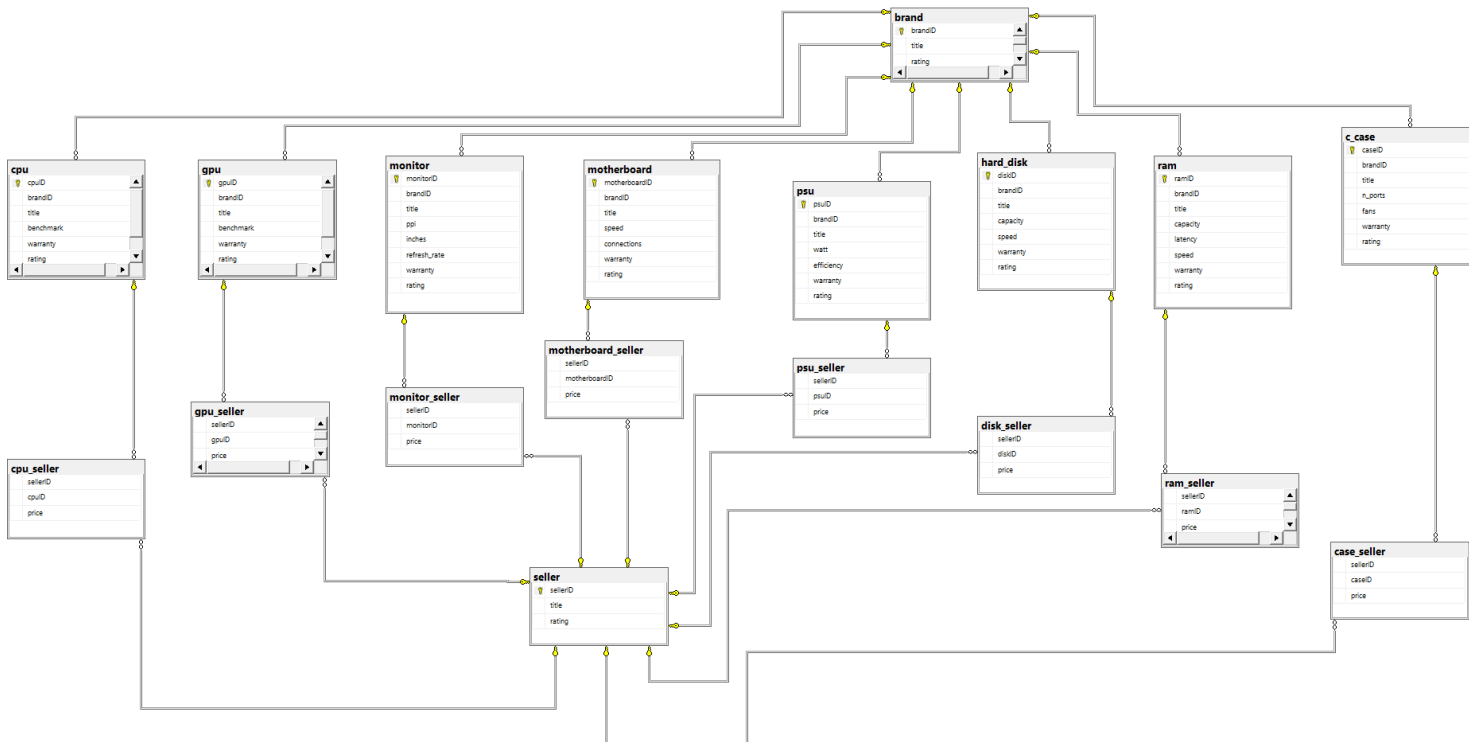
c_case table

- caseID --> brandID, title, n_ports, fans, warranty, rating

monitor table

- monitorID --> brandID, title, ppi, inches, refresh_rate, warranty, rating

Tables



Triggers

ram_del trigger: When a record gets deleted from “ram_seller” table which means a seller stop selling a particular ram, this trigger checks for if any other seller is still selling that ram. If not ram gets deleted from “ram” table. Here is a scenario that trigger happens:

1) inserting a new ram to ram list:

```
select * from ram
```

```
insert into ram  
values(4, 'DENE ME', 16, 16, 3600, 2, 8.3)
```

```
select * from ram
```

Results Messages

	ramID	brandID	title	capacity	latency	speed	warranty	rating
1	5	4	vengeance lpx	16	16	3600	2	8.3
2	6	3	Fury	16	16	3600	5	7.9
3	7	2	1rx16	4	17	2400	2	8.6
4	8	1	CT87349274	8	19	2666	2	9.1

	ramID	brandID	title	capacity	latency	speed	warranty	rating
1	5	4	vengeance lpx	16	16	3600	2	8.3
2	6	3	Fury	16	16	3600	5	7.9
3	7	2	1rx16	4	17	2400	2	8.6
4	8	1	CT87349274	8	19	2666	2	9.1
5	11	4	DENE ME	16	16	3600	2	8.3

2) Add a seller that sells the ram we just added.

```
select * from ram_seller

insert into ram_seller
values(1,11,1200)

select * from ram_seller
```

	sellerID	ramID	price
16	4	8	660
17	5	5	1243
18	5	6	1095
19	5	7	300
20	5	8	637

	sellerID	ramID	price
10	3	6	1177
11	3	7	245
12	3	8	677
13	4	5	1300
14	4	6	1200
15	4	7	272
16	4	8	660
17	5	5	1243
18	5	6	1095
19	5	7	300
20	5	8	637
21	1	11	1200

3) Remove only seller that sells the ram from ram_seller table which triggers ram to be deleted also.

```
select * from ram

delete from ram_seller where ramID = 11

select * from ram
```

	ramID	brandID	title	capacity	latency	speed	warranty	rating
1	5	4	vengeance lpx	16	16	3600	2	8.3
2	6	3	Fury	16	16	3600	5	7.9
3	7	2	1rx16	4	17	2400	2	8.6
4	8	1	CT87349274	8	19	2666	2	9.1
5	11	4	DENEME	16	16	3600	2	8.3

	ramID	brandID	title	capacity	latency	speed	warranty	rating
1	5	4	vengeance lpx	16	16	3600	2	8.3
2	6	3	Fury	16	16	3600	5	7.9
3	7	2	1rx16	4	17	2400	2	8.6
4	8	1	CT87349274	8	19	2666	2	9.1

Query executed successfully.

disk_del trigger: When a record gets deleted from “disk_seller” table which means a seller stop selling a particular disk, this trigger checks for if any other seller is still selling that disk. If not, disk gets deleted from “disk” table.

There are also 6 more triggers that does the similar functionality as these two I described for different parts of computer such as psu, gpu. Here is the list:

- *cpu_del trigger*
- *gpu_del trigger*
- *psu_del trigger*
- *monitor_del trigger*
- *motherboard_del trigger*
- *case_del trigger*

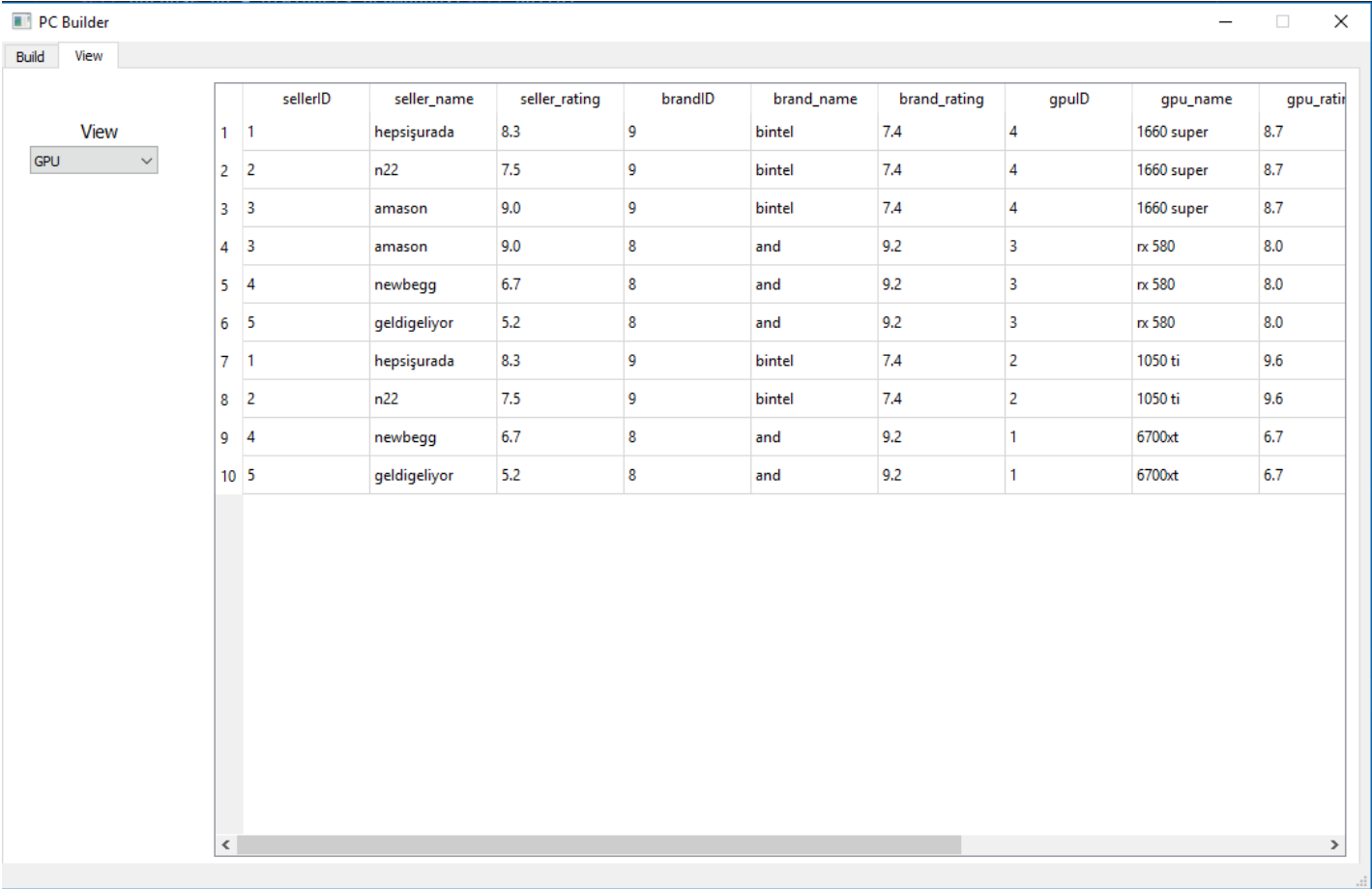
Views

There is a View tab in my interface. That you can view parts of computer individually. Views called in there collect data from 3 tables to create a row for a product. For example to view rams, the view joins data from “ram”, “ram_seller” and “seller” tables.

```
create view [view_ram]
as
select s.sellerID, s.title as seller_name, s.rating as seller_rating,
      b.brandID, b.title as brand_name, b.rating as brand_rating,
      rs.ramID, r.title as ram_name, r.rating as ram_rating, r.capacity, r.latency, r.warranty,
      rs.price
from
ram_seller as rs
LEFT OUTER JOIN seller as s ON s.sellerID = rs.sellerID
LEFT OUTER JOIN ram as r ON r.ramID = rs.ramID
LEFT OUTER JOIN brand as b ON r.brandID = b.brandID
```

List of views

- view_ram
- view_disk
- view_cpu
- view_psu
- view_gpu
- view_case
- view_monitor
- view_motherboard



Stored Procedures

The screenshot shows a window titled "PC Builder" with two tabs: "Build" and "View". The "Build" tab is active. On the left, there are several filters: a price filter set to "4000" with a currency symbol, and five rating filters (Minimum Seller Rating, Minimum Brand Rating, Minimum Product Rating, Minimum Warranty) all set to "7,0". There are also dropdown menus for "Purpose of use" (set to "Working") and "User Interaction" (set to "Focus"). A blue button labeled "→ Build My Computer!" is below these filters. To the right of the filters is a vertical list of computer parts: CPU, GPU, Disk, RAM, MOTHERBOARD, MONITOR, CASE, and PSU. Each part has a corresponding empty rectangular box to its right, presumably for displaying the selected item.

To build a computer software takes parameters from user as seen above. And by using these parameters software makes a stored procedure call from database for each computer part. In these procedures, software uses views to get data and filters, orders afterwards to return.

Here is my possible_rams stored procedure:

```
create procedure possible_rams @seller_rating numeric(2,1), @brand_rating numeric(2,1), @ram_rating
numeric(2,1), @price int, @warranty int
as

select * from [view_ram]
where price <= @price and seller_rating >= @seller_rating and ram_rating >= @ram_rating and
brand_rating >= @brand_rating and warranty >= @warranty
order by cast(capacity as numeric(6,3)) / cast(latency as numeric(6,3)) asc, price desc, ram_rating
asc, seller_rating asc

go
```

And below are other procedures for other parts:

- possible_disks
- possible_cpus
- possible_gpus
- possible_psus
- possible_monitors
- possible_motherboards
- possible_case

There are also 2 procedures to show brands and sellers in view tab.

```
create procedure get_sellers
as

select s.sellerID, s.title as seller_name, s.rating as seller_rating
from seller as s
order by s.rating desc

go
```

```
create procedure get_brands
as

select b.brandID, b.title as brand_name, b.rating as brand_rating
from brand as b
order by b.rating desc

go
```

Note

I used “sql server express” and “microsoft sql server management studio” for creating database.

Example Usages of PC Builder

PC Builder

BuildView

8000

7,0

7,0

7,0

2

Working

Performance

→ Build My Computer!

CPU

GPU

Disk

RAM

MOTHERBOARD

MONITOR

CASE

PSU

sellerID	seller_name	seller_rating	brandID	brand_name	brand_rating	cpulD
1	hepsişurada	8.3	8	and	9.2	1
< >						
sellerID	seller_name	seller_rating	brandID	brand_name	brand_rating	gpulD
2	n22	7.5	9	bintel	7.4	2
< >						
sellerID	seller_name	seller_rating	brandID	brand_name	brand_rating	diskID
1	hepsişurada	8.3	3	princeton	9.3	4
< >						
sellerID	seller_name	seller_rating	brandID	brand_name	brand_rating	ramID
2	n22	7.5	3	princeton	9.3	6
< >						
sellerID	seller_name	seller_rating	brandID	brand_name	brand_rating	motherboa
3	amazon	9.0	11	usus	8.1	6
< >						
sellerID	seller_name	seller_rating	brandID	brand_name	brand_rating	monitorID
1	hepsişurada	8.3	11	usus	8.1	2
< >						
sellerID	seller_name	seller_rating	brandID	brand_name	brand_rating	caselD
2	n22	7.5	17	malzan	9.1	1
< >						
sellerID	seller_name	seller_rating	brandID	brand_name	brand_rating	psulD
2	n22	7.5	15	yhermaltake	9.2	2
< >						

Total Price is 7890₺

PC Builder

Build

View

1000

⌵

8,0

Minimum Seller Rating

9,0

Minimum Brand Rating

7,3

Minimum Product Rating

4

Minimum Warranty

Gaming

Purpose of use

User Interaction

Focus

→ Build My Computer!

Cannot build
build such a
computer!
ㄒ(ツ)ㄒ

CPU

GPU

Disk

RAM

MOTHERBOARD

MONITOR

CASE

PSU

PC Builder

Build

View

View

Case

	sellerID	seller_name	seller_rating	brandID	brand_name	brand_rating	caseID	case_name	case_rating
1	1	hepsişurada	8.3	18	heater master	8.1	2	h510	6.4
2	2	n22	7.5	18	heater master	8.1	2	h510	6.4
3	3	amason	9.0	18	heater master	8.1	2	h510	6.4
4	4	newbegg	6.7	18	heater master	8.1	2	h510	6.4
5	5	geldigeliyor	5.2	18	heater master	8.1	2	h510	6.4
6	1	hepsişurada	8.3	17	malzan	9.1	1	z300	8.6
7	2	n22	7.5	17	malzan	9.1	1	z300	8.6
8	5	geldigeliyor	5.2	17	malzan	9.1	1	z300	8.6
9	3	amason	9.0	16	minibyte	8.3	3	td500	9.3
10	4	newbegg	6.7	16	minibyte	8.3	3	td500	9.3
11	5	geldigeliyor	5.2	16	minibyte	8.3	3	td500	9.3
12	5	geldigeliyor	5.2	11	usus	8.1	4	helios	7.7

View

Seller ▾

	sellerID	seller_name	seller_rating
1	3	amason	9.0
2	1	hepsişurada	8.3
3	2	n22	7.5
4	4	newbegg	6.7
5	5	geldigeliyor	5.2